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A MODEL OF CHANGE PROCESS AND ITS USE IN SELF-ASSESSMENT

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A MODEL OF CHANGE PROCESS AND ITS USE IN SELF-ASSESSMENT

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ABSTRACT

Two empirical phenomena motivate our study. First is managers’ ongoing pursuit of effective change management technology despite the gigantic normative body of knowledge on the subject. This pursuit is intensifying as planned changes become more complex, and as pressure to execute mounts. Second, an increasing number of organizations are experimenting with “self-assessment”—a process of evaluating the effectiveness of organizational systems with little or no outside help. The quality movement in particular appears to have stimulated organizational interest in the self-assessment approach.

In this investigation we cross these two concepts and consider self-assessment as structure for managing change and its implementation. The opportunity for theoretical contribution is significant, since the literatures on both self-assessment and change implementation are relatively thin.

In the first part of the study, we develop and validate a model of change process. Such a model is important since it defines what aspects of change process get assessed. Few change process models have been validated rigorously in the literature. We investigate the model’s conceptual validity by comparing its content to a number of research streams. Then, we evaluate the unidimensionality and predictive validity of an associated measurement model by employing various quantitative methods. We find both the conceptual model and the measurement model to exhibit considerable validity.

With a change model defined and understood, we then investigate the self-assessment process in which the model is used. More specifically, we seek to define the theoretically salient features of the self-assessment process and its consequences. We also search for contextual variables that suggest the conditions under which self-assessment is likely or encouraged. The research approach here is primarily qualitative and empirically grounded in case-based observation. We generate a number of propositions and integrate them into a model of self-assessment in the context of change management. The model is largely provisional and meant to stimulate further theory development in this area.
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Chapter 1: The Research Problem

1.1 Introduction

In the fall of 1998, local members from the Center for Quality of Management (CQM) convened to discuss key problems that confronted their respective organizations. The goal of this executive-led discussion was to identify a topic for a collaborative research “study group.” A common problem revealed at this meeting related to difficulties with implementing change in their organizations. The managers agreed that a valuable study group project would be to develop methodology that CQM member organizations could utilize to diagnose and improve processes for managing change.

The research style of CQM study groups typically blends an “action research” (Lewin 1946) approach with collaborative contribution from academia (Burchill, Gomez, and Walden 1996). This style often leads CQM study groups to partner with local universities to enrich the effort. As a consequence of this particular partnership, this researcher joined the study group as a participant/observer.

Initially, this researcher was puzzled by what the group was trying to do. After all, a wealth of change technology is available to managers. Consider, for example, the large volume of printed media on change management. A recent book search at Amazon.com on “organizational change” returned 1660 records; a search on “change management” returned 1825 matches. The change management frameworks developed by scholars and consultants number in the hundreds (Burke 1995). In fact, most of the organizations represented on the study group had closely examined at least one change model—and usually at least one consultant retained to help deploy the model. However, most of these encounters had been deemed failures.

What these organizations craved was not another abstract framework, but some methodology that they could apply on their own—with little or no outside help—to better manage change processes. These managers preferred to produce this methodology themselves via the
collaborative CQM domain, rather than to purchase an externally developed technology. In subsequent months the study group toiled to deliver such methodology. The result was a survey-based diagnostic process for self-assessing change implementation efforts.

The tenacity by which these organizations supported this initiative, and the enthusiasm that managers exhibited upon exposure to the methodology, suggested a phenomenon worthy of investigation.

1.2 Motivation for Study

1.2.1 Change management challenges and its consequences

What has motivated the managerial search for effective change management structure? The dynamic environment that confronts today’s organization seems an obvious factor. However, a sweeping claim about the importance of change management in the context of environmental turbulence seems trite and hardly contestable. After all, has there been a time when the environments surrounding organizations have not been viewed as turbulent? Or when the turbulence gradient has not been observed as increasing?

That said, some observers have suggested that the nature of organizational change has indeed evolved towards a state that presents unique challenges to managers. Nadler and Tushman (1989) claimed that the trend in organizational change has been towards more large-scale, planned change. Large scale, planned change differs from historical notions of organizational change due to the following characteristics:

- Typically initiated by the leaders of organizations rather than consultants or human resource specialists.
- Closely linked to business issues, not just questions of organizational process or style
- Usually traced directly to external factors, such as new sources of competition, new technology, deregulation or legal initiatives, maturation of product sets, changes in ownership, or shifts in fundamental market structure.
• Affects the entire organization (whether it be an entire corporation of business unit), rather than individual SBUs or departments.

• Profoundly affects the organization, since the change usually influences organizational values regarding employees, customers, competition, or products.

The popular business press provides us with no shortage of organizational “change stories.” For example, *Fortune’s* April 26, 1999 “Five Hundred” issue included feature-length articles on seven prominent firms (AT&T, Morgan Stanley Dean Witter, Microsoft, IBM, Viacom, Proctor & Gamble, and Du Pont) embroiled in large-scale change efforts. The industrial diversity represented by these organizations suggests the pervasiveness of the change phenomenon.

Empirical evidence suggests that many of these change efforts do not go smoothly. In a Conference Board (Troy 1994) survey of 160 U.S. and European firms, less than 50% reported high overall levels of progress towards the organizational goals linked to their change initiatives.

Nadler and Tushman (1989) proposed a number of reasons why large scale, planned change can be difficult to achieve:

• *Multiple transitions.* Rather than being confined to one transition, complex changes often involve many different transitions. Some transitions may be related; others are not. Troy’s (1994) data support this observation: 60% of surveyed firms were involved in changes of no less than sixteen organizational design variables and dimensions (such as corporate strategy definition, business process design, and human resource performance measurement).

• *Incomplete transitions.* Many of the transitions that organizations initiate are not completed. Events overtake them, or subsequent changes subsume them. For instance, when one firm is acquired by another firm, the merger may trump extant change initiatives.

• *Uncertain future states.* Volatile environments make it difficult to visualize desired outcomes of the change. Such difficulties may translate into problems with monitoring and control of
an implementation’s progress. Indeed, Troy’s (1994) study found that only forty percent of firms sought to measure the performance of their change initiatives.

- **Transitions over long periods of time.** Many large-scale organizational changes take long periods of time to implement. Kotter (1995) noted that managers frequently fail to appreciate the significant time horizon required to implement large-scale organizational change. Alexander (1985) reported that 75% of surveyed firms found that the implementation of strategic decisions took longer than originally anticipated. Troy (1994) found that a significant percentage (5 to 15%) of organizations forecast eight years or more to implement many of their change initiatives.

In addition to the increased “degree of difficulty” associated with managing change, the consequences of poor change management are severe. Problems with executing strategic change have been empirically associated with executive failure and termination (Charan and Colvin 1999). The pervasiveness and power of information in today’s economy (Shapiro and Varian 1999) in combination with rising interest of outsiders (such as investors) in firm performance appears to have tightened the coupling between many organizations and their environments. In a tightly coupled relationship, external forces can exercise more control over the firm (Pfeffer and Salancik 1978). Tighter coupling exposes mucked change efforts to more outside scrutiny, leaving the firm vulnerable to a quick dose of negative feedback (falling stock prices, sour press, etc.) from powerful entities in the environment.

As the pressure to execute mounts, it is of little wonder that managers seek tools to extend their ability to implement large-scale change. The complex nature of change that confronts firms, and the value that managers place on obtaining better structure to manage this change, provides motivation for this investigation.

### 1.2.2 The increase in self-assessment

Another motivator stems from the phenomenon of “self-assessment.” In the organizational context, the term assessment refers to a process of measuring the effectiveness of
an organization from the behavioral or social-system perspective (Lawler, Nadler, and Cammann 1980: 9). A distinguishing feature of organizational assessments is holistic perspective. True to the tenets of systems theory (Forrester 1958, Churchman 1968, Ackoff and Emery 1974), the unit of analysis is the process or system and its relationship to performance, rather than myopic focus on the system’s individual moving parts.

Self-assessment relates to the tendency of firms to conduct evaluations of organizational systems with little or no outside help. Increasingly, firms seek to “do it themselves.” The movement towards internalization contrasts with the traditional approach to organizational diagnosis and assessment, which has usually involved an external consultant to manage the process (e.g., Lawler et al. 1980, Harrison and Shirom 1999).

An increasing number of firms have signaled interest in self-assessment. The quality movement appears to have boosted this interest. Evidence of this relationship can be found in the expanding popular literature on the self-assessment topic; many self-assessment articles appear in quality-related magazines. These articles frequently prescribe the use of quality management frameworks, such as the Malcolm Baldrige Criteria for Performance Excellence, as the comparative model for the assessment process (e.g., Jordon 1994, Knutton 1994, Zaremba and Crew 1995, Brereton 1996, Wu, Wiebe, and Politi 1997, Caravatta 1997, Fountain 1998). Data suggest that the number of firms that are exploring self-assessment is not trivial. For example, a study of 70 companies in the United Kingdom revealed that approximately two-thirds had at least experimented with self-assessment using a quality management framework (Finn and Porter 1994).

While the quality movement may have influenced the interest in the self-assessment phenomenon, there is evidence of the application of self-assessment to other organizational areas as well. Self-assessment frameworks have been proposed in such contexts as accounting (Marden and Edwards 1997, Porter, Oakland, and Gadd 1998), information systems (Fearon and Philip
product development (McQuarter et al. 1998), manufacturing (Voss, Chiesa, and Coughlan 1994), and strategic planning (Knorr 1990).

Despite the empirical outflow of interest in organizational self-assessment, the theoretical treatment of this phenomenon is underdeveloped. We note in Chapter 2 that research concerning self-assessment in the organizational context in general, and in the change management context in particular, is relatively lacking. The lag between the growing empirical trend towards self-assessment and scholarly research on the subject provides further incentive for this study.

1.3 Defining the General Phenomenon

According to Miriam-Webster, “assess” implies a critical appraisal for the purpose of understanding or interpreting, or as a guide in taking action. Synonyms of assess include appraise or evaluate. If we extend this dictionary definition to the assessment notion described above, self-assessment becomes a self-evaluation or self-appraisal of an organizational system to understand the system’s effectiveness, or to provide guidance for action.

We are interested in self-assessment as it relates to managing change. This context serves as an important qualifier when parsing the literature, since many aspects of organizations—such as culture (Schein 1985, Kilmann 1985, Kotter and Heskett 1992), group behavior (Hackman 1987, Anacona 1990), and politics (Pfeffer 1981, Enz 1989)—can be assessed.

Organizational assessments focus on systems-level evaluation (Lawler et al. 1980). We assume, therefore, that managing change can be considered a system or process. Abstracting from the large volume of theoretical and empirical work on change management, a high-level representation of a change management system might look something like this:

Change determination → Change implementation → Change results
Simply stated, a change management system consists of activities for determining the content of the change, and then activities for implementing the change. These activities produce the results of the change.

Of particular interest to us is the middle piece of this stylized model—systems for implementing change. As we will note in Chapter 2, implementation research has significantly lagged work on change determination, particularly for change at the strategic level (see Noble 1999 for a recent review). Practitioners are certainly interested in implementation process; implementation embodies the prized managerial constructs of “execution” and “getting it done.”

A point here is that we view organizational change as definable and premeditated. A dominant coalition (Cyert and March 1963), most likely senior management, has defined a change program, and the organization is either about to implement, in the process of implementing, or has completely implemented, the change initiative. We view change determination as an antecedent to change installation—although we acknowledge that the path from change formulation to change implementation may not be so recursive (Lindblom 1959, Mintzberg 1978, Quinn 1980, Pascale 1984).

Our phenomenon of interest, then, relates to the organizational use of self-assessment in implementing planned change.

1.4 Focus on the Model

Our phenomenon offers a number of research possibilities. In this investigation, we focus on models of change implementation used by organizations in a self-assessment mode. By selecting this scope, we examine a critical issue upon which additional research can be based. The issue: In the context of implementing planned change, what gets assessed?

An assessment model provides the analytic tool for assessing organizational behavior in light of some organizational outcome (Nadler 1980a). All organizational assessments employ models, regardless of whether the model is explicit or not (Hausser 1980).
Nadler (1980a) observed that models used in organizational assessment were primarily models of organizational behavior and functioning. These models included constructs that reflected aspects of organizational behavior, and at least one construct that represented a measure of the impact of the behavior on organizational outcomes, or “effectiveness.”

Incorporating Nadler’s observations into our experimental context, we seek to develop a model that adequately reflects the process of implementing change in organizations. We seek variables that reflect the change implementation construct, and the relationships between variables. As part of the model, we need to include a construct that reflects an important organizational outcome—in this case, a construct of successful change.

Once a model of change implementation has been developed and validated, we can then more comfortably move towards more advanced research issues, such as how and why a model is used in a self-assessment mode. Answering such how and why questions are important, since explanation is important for useful theoretical contribution (Whetten 1989).

1.5 Research Questions

We organize our research around three categories of research questions. First, when assessing the implementation of planned change, what gets assessed? What are the key variables that define the change implementation process? Are these variables consistent with what is known about organizational phenomena? Do higher levels of these variables correspond to higher levels of change success? Or, does stronger agreement among managers on the levels of the variables, as suggested by research on top management consensus (e.g., Bourgeois 1980, Priem 1990, Hambrick 1997, Smith and Kofron 1996), relate to the level of change success?

Second, given a particular model, what are the structure and consequences of self-assessment? What are the defining theoretical categories of self-assessment process? Does the model generate near-term information that facilitates managerial control (Anthony 1965, Lorange and Scott Morton 1974, Merchant 1985) of the change implementation? Or does use of the

Third, given a particular model, what conditions encourage self-assessment? Under what situations might we expect an organization to use a particular model for self-assessment? Does it depend on the perceived validity of a particular self-assessment model? Is self-assessment appropriate for all types of organizational change, or best limited to a certain type of change, such as the strategic change (Nadler and Tushman 1989)? Use of self-assessment and a particular model could also relate to the process’s agreement or fit with existing structure for managing change. Finally, conducting self-assessments may be influenced by a firm’s tendency to value learning and experimentation (Nevis, DiBella, and Gould 1995).

1.6 The Forthcoming Chapters

In Chapter 2, we examine a number of literature streams that touch the conceptual domain of our phenomenon. We identify key concepts from the literature that will help us generate propositions that will drive our investigation.

Chapters 3 and 4 deal with answering the first category of research questions posed above. We examine the development and validation of a change process model designed for use in a self-assessment. We base our examination on the model developed by the CQM study group (the “CQM model”). Practitioners using a process of considerable rigor derived the CQM model. We define the variables and relationships of this model, and examine its validity. Both quantitative and qualitative research methods are employed.

In Chapter 5, we primarily seek answers to the second and third research question categories posed above. While in Chapters 3 and 4 the research approach favors a deductive, validation-oriented research approach, in Chapter 5, we favor an inductive, theory-building mode. Specifically, we seek to identify variables and relationships that help us expand a theory of self-
assessment in the change management context beyond the scope of the change model studied in Chapters 3 and 4. The focus of this chapter is conceptual, and integrates data obtained from fieldwork with theoretical concepts obtained from the literature. Primarily, we seek to generate propositions that can be further developed in future research efforts.

In Chapter 6, we summarize our contribution and the general issues for future work.
Chapter 2: The Literature

In this chapter, we review the relevant literature. The review is necessarily broad and touches a number of literature streams. This review serves two main purposes. First, by understanding concepts and findings of previous scholars, we become engaged in the theoretical conversation that shapes this investigation. Second, some of this research provides useful raw material for the development and testing of propositions that follow.

2.1 Change Management Literature

2.1.1 Models of change

Many organizational models exist for diagnostic and evaluative purposes in change management. Quoting from Burke (1995: 53-54):

Pick 100 organizational consultants, and we would have 100 different diagnostic models…After having seen at least as many as 500 of these models, I have yet to see two that are the same.

It is often difficult to differentiate between models of organizational behavior and models of organizational change. In many circumstances a model of organizational behavior is applied to a change management context. For example, Nadler and Tushman’s (1980) congruence model of organizational behavior has been used in the diagnosis and management of large-scale planned change (Nadler and Tushman 1989, Tushman and O’Reilly 1997).


A side-by-side comparison of many of these models finds many similarities. Many models have built upon Leavitt’s (1965) conceptualization of organizations as multivariate systems with four interacting variables: people, task, structure, and technology. For example, in
his comparison of the Weisbord (1976), Nadler and Tushman (1980), and Tichy (1983) models, Burke (1995) observed that the models had more similarities than differences—basically due to their inclusion of Weisbord’s (1965) four elements. Each model included representations of external environment, the mission or strategic direction of the organization, structure (as represented by formal organizational arrangements and prescribed networks, people and relationships, resources, tasks, and organizational processes.

Few change models have been put through rigorous testing of validity (Nadler 1980a). Rather, the validity of most change models has been tested less formally, usually through consultant-based applications with clients and through comparison to empirical observation (e.g., Weisbord 1976, Kotter 1978, Nadler and Tushman 1989)—thus resembling the Lewinian (1951) action research mode. One exception has been the Burke-Litwin model, where the development, validation, and use of the model have been formally reported to at least some degree (Bernstein and Burke 1989, Burke and Litwin 1992, Burke and Jackson 1991).

The use of a consultant to operationalize the model has been a common theme of diagnostic change assessment activity. One reason is that expertise has usually been required to convert the change model’s abstract variables into concrete questions for a survey questionnaire. For example, Burke (1995) reported a consulting case where he converted the 10-12 variables in his change model to a 150-item questionnaire. In addition, consultants sometimes work with the client organization to customize the diagnostic model to the client’s particular situation and need (Tichy, Hornstein, and Nisberg 1976).

One emerges from this literature with the sense that the choice of a particular model may not be the most critical activity when organizing a diagnostic process for managing change. There is broad evidence that a number of these models have been successfully employed in change management efforts.
2.1.2 Change process

Change has been commonly portrayed as moving through three phases. Lewin (1958) called these three stages unfreezing-moving-refreezing. Beckhard and Harris (1977) referred to them as the current state, the transition state, and the future state. Generically, these phases might be termed before-during-after (Table 2.1).

| Table 2.1: Three Phases of Change |
|-----------------|-----------------|-----------------|
|                 | Lewin (1958)    | Beckhard and Harris (1977) | Generic phases |
| 1               | Unfreezing      | Current state | Before |
| 2               | Moving          | Transition state | During |
| 3               | Re-freezing     | Future state   | After  |

A large portion of change management research can be placed in the “before” phase. The common sequence proceeds as: Diagnose organization → Initiate change (e.g., French and Bell, 1973, Beer 1980, Lawler et al. 1980, Harrison and Shirom 1999). The resulting change is frequently termed an “intervention.” The content of the intervention is often only determined once the diagnosis is complete (e.g. Argyris 1970, Dyer 1981, Harrison 1989). Sometimes, the diagnostic assessment is meant to determine the organization’s “readiness for change” (e.g., Zeira and Avedisian 1989).

Empirical research has corroborated the significance of diagnostic activities prior to change. Various site case studies have found that activities to diagnose organizational conditions prior to change have frequently been an antecedent to successful change implementation (e.g., Ackerman 1982, Goodstein and Burke 1994). A larger scale study of 30 firms engaged in downsizing activities in the auto industry found that firms that planned through systematic analysis of jobs, resource usage, and human resource management issues were more likely to attain subsequent improvements in performance (Cameron, Freeman, and Mishra 1991, Cameron 1994).
2.1.3 Change evaluation and control

We know less about the “during” and “after” phases of the change process. One activity that has been commonly prescribed for effective change management relates to evaluating and monitoring the implementation of the change (e.g., Kilmann and Herden 1976, Kotter and Schlesinger 1979, Hunsucker and Loos 1989, Nadler and Tushman 1989, Tushman and O’Reilly 1997). However, little research has been published that has formally investigated change evaluation and monitoring.

A common problem associated with conducting research in change evaluation and monitoring has been difficulties of evaluating and measuring organizational change efforts (Cameron 1980, Lewin and Minton 1986). One daunting task has been choosing representative indicators from the dozens of potential measures of organizational effectiveness cited in the literature (see Goodman and Pennings 1977 for representative surveys of available measures). Another issue has related to the signal of organizational change from the noise that results from observers who lose their frame of reference as the change proceeds (Zmud and Armenakis 1978).

Some recommendations have been made to improve change measurement and evaluation. Longitudinal data collection has been proposed to capture the effects of changes that may significantly lag the initial intervention (Lawler 1977, Ettlie and Rubenstein 1980). Complex change may require the use of more subjective, qualitative measures of change rather than quantitative measures (Kilmann and Herden 1976). The use of surveys of organizational member to measure targeted behavioral or attitudinal change has also been proposed (Lindell and Drexler 1979, Randolph 1982).
2.2 Organizational Assessment Literature

2.2.1 Defining organizational assessment

Two themes tend to pervade the organizational assessment literature. These themes can be sensed from the following definition of organizational assessment (Lawler, et al. 1980: 6):

Organizational assessment is the process of measuring the effectiveness of an organization from the behavioral or social-system perspective

The first theme is that organizational assessment is holistic in perspective. This perspective is rooted in organizational systems theory (Forrester 1958, Churchman 1968, Ackoff and Emery 1972), and in the systemic link between the organization and its environment (Lawrence and Lorsch 1967, Katz and Kahn 1966). Lawler et al. (1980: 9) argued that holistic assessment was appropriate since organizations resemble complex, interactive systems; inaccurate, perhaps misleading, assessment would result from myopic focus on individual pieces of the system.

The second theme is that organizational assessment focuses on behavioral aspects and their outcomes. This is evident not only in definitions of organizational assessment, such as the example above, but also in the models that scholars have used to support organizational assessment. Nadler (1980a) observed that models used in organizational assessment were primarily models of organizational behavior and functioning. These models included constructs that reflected aspects of organizational behavior, and at least one construct that represented a measure of the impact of the behavior on organizational outcomes, or “effectiveness.”

It should be noted that there has been ongoing interplay in the literature between the terms “assessment” and “diagnosis.” Frequently these terms have been interchanged. Some scholars have differentiated between the terms. For example, Harrison and Shirom (1999: 7-8) argued that diagnosis related to investigations that evoke behavioral science methods to examine the organization’s current state in order to solve problems or enhance organizational
effectiveness. To them, assessment had a narrower scope, and related more towards the
evaluation of more focused organizational projects or functions.

2.2.2 Who uses assessments and for what purpose?

Although the term “organizational assessment” suggests that organizations are perhaps
the primary users of assessments, much of the literature suggests that organizational assessments
serve mostly as an analytic tool for scholars who seek answers to research questions about
organizational issues. Popular topics for assessment-based research have included job design and
worker attitudes (Hackman and Oldham 1975, 1976, Likert 1967) and general employee relations
(Merrihue and Katzell 1955).

We know less about how organizations use organizational assessments. Lawler et al.
(1980) claimed that internal decision makers used organizational assessments in a variety of
ways, including job-choice decisions, human resource management decisions, systematic
diagnosis and change, and program evaluation and resource allocation decisions.

Two of these proposed uses, the use of organizational assessment for systematic
diagnosis and change, and the use of assessment for program evaluation, are important to our
investigation.

2.2.2.1 Use of assessment for diagnosis and change

A general assumption organizational assessment literature is that assessments facilitate
organizational change. Frequently, the background scenario presented by scholars is that
managers are interested in determining “what’s wrong” with human systems in the organization
(Lawler et al. 1980). In this light, organizational assessment serves to “diagnose” the health of
behavioral systems, and to provide potential guidance on what requires adjustment. The concept
of “diagnosis,” followed by an organizational change (the change is commonly called an
“intervention”) captures the essence of the organization development (OD) approach (e.g., Beer
2.2.2.2 Use of assessment in program evaluation

The second possible use of organizational assessment that is important to us is for program evaluation. How organizational assessments are used to evaluate programs has remained largely conceptual. The basic concept portrays the organization as either in the midst of implementing, or having finished the implementation of, a specific change. It has been proposed that managers could use organizational assessments to evaluate progress of the change implementation (Lawler et al. 1980).

Researchers have suggested that, in most program evaluations, formative and/or summative data are missing (Scriven 1967, Staw 1977). Formative data provide feedback on an ongoing basis that help shape and improve the program. Summative data indicates the success or failure of the program. The problems with developing organization-based measures of effectiveness have been widely treated (e.g., Goodman and Pennings 1977, Seashore et al. 1983). Despite the measurement problems, some have suggested that organizations should adopt systematic assessment processes (Campbell 1969). It has been suggested that the existence of an ongoing assessment program could serve to track the results of planned organizational change (Lawler et al. 1980).

We should note that the concept of using assessments to evaluate change programs is highly relevant to our investigation. Self-assessment could be utilized to provide information on how well a change is being, or has been, implemented.

2.2.3 Assessment models

Models used in organizational assessment are primarily models of organizational behavior and functioning, and they have been formulated at various levels of analysis (Nadler 1980a). An assessment model provides the analytic tool for assessing organizational behavior in light of some organizational outcome.

There are numerous ways to categorize assessment models. One way is to group them by the underlying discipline or organizational construct. For example, there are models of

Some scholars have preferred other classification schemes. Nadler (1980a) grouped assessment models by level of abstraction, ranging from highly abstract (e.g., Katz and Kahn 1967), to intermediate (e.g., Nadler and Tushman 1980), to highly specific (e.g., Hackman and Oldham 1976). Hausser (1980) classified assessment models as focusing either on individuals (e.g., Campbell et al. 1970), groups (e.g., Likert 1961, 1967), or the entire organization (Pugh and Pheysey 1972).

The important message here is that a number of models have been utilized for organizational assessments, depending on the objective of the assessment. To be put into use in a particular situation, most of assessment models must be tailored to the specific situation (Lawler et al. 1980, Harrison and Shirom 1999).

As an alternative to models developed by external consultants alone, some scholars have suggested that diagnostic models should be co-developed by the consultant and the client organization (Tichy, Hornstein, and Nisberg 1977). Co-development has been proposed to ensure that the resulting model represents the assumptions, perspectives, and experiences of both the consultant and the host.

### 2.2.4 Issues in assessment process

Three entities have roles in the assessment process. One entity is the organization that is the target of the assessment activities; the people in it are the source of much of the information that must be collected. Another entity is the consultant, responsible for using organizational theories and measurement tools to collect information about the organization and for providing the resulting information to clients. Finally, there is the client, who will receive and use the
results of the assessment efforts and who generally provide the resources for conducting assessment activities.

Scholars frequently frame the assessment process as a stream of temporal events involving the organization, the consultant, and the client (Kahn and Mann 1952, Argyris 1958, Junker 1960, Schatzman and Strauss 1973). Lawler et al. (1980: 497) portrayed the assessment process as divided into three general groups of activities. Pre-collection activities consisted of entry by the consultant and planning the data collection. Formal data collection activities followed. Finally, there were the post-collection activities of analysis, reporting, data use, and termination. For comparison, Van de Ven (1980) proposed a six-phase process model for conducting organizational assessment: evaluation prerequisites, goal exploration, criteria development, evaluation design, evaluation implementation, data analysis, feedback, and evaluation.

Many scholars have advocated a split-role model, where the consultant/analyst comes from an area outside the organization being assessed (Likert and Lippitt 1953, Barnes 1967, Walton 1969, Riecken 1972, Nunnally 1975). The major issue here involves the maintenance of analytical objectivity. In Suchman’s (1971) view, however, a tradeoff existed. Outsiders were more objective but less sensitive to organization and likely to be less credible with recommendations. Insiders were potentially more informed and sensitive, but often blind to basic analytical assumptions—and prone to be less objective.

2.2.5 Research on self-assessment

Despite the strong normative stance towards the importance of the outside consultant, a few scholars have suggested the importance of obtaining the organization’s active participation during the assessment effort. Participation helps obtain the legitimization of, support for, and use of an organization assessment (Van de Ven 1980). Other organization theorists have felt that active involvement by the organizational users facilitates adoption of the change being implemented (Bennis, Benne, and Chin 1962, Beckhard 1969, Clark 1976).
Tichy and Hornstein (1980) conceded that there were three possible scenarios for managing the assessment process. There was the pure research scenario, where an outside researcher conducts an expert assessment and manages most of the project himself. An assessment aimed at enhancing organizational performance while also providing data for research suggested a collaborative consultant-client-organization effort in managing the assessment process. Finally, there was the user-dominated self-assessment, where members of the organization launched their own internal audit or assessment with little or no outside help.

Tichy and Hornstein (1980) suggested that the user-dominated assessment might be preferable when the assessment problem is not very complex. Generally, this might occur when a concrete organizational problem surfaces and requires some simple yet systematic analysis. Tichy and Hornstein suggested other conditions that might favor self-assessment, including (1) when quick turn around is required, (2) when minimum concern exists for contributing to scientific knowledge, (3) when there is a great need for member commitment to using the results.

Harrison and Shirom (1999) suggested that an organization could conduct self-diagnosis without the aid of a professional consultant if the organization was open to self-analysis and criticism, and if some members had the needed skills for gathering and interpreting the information.

Beckhard (1975) suggested that an organization could be coached or trained into conducting self-diagnosis. He suggested that organizations would require skills in diagnosis and change determination strategies. He also suggested that the organization would require knowledge of the organization’s relationship to its external environment and understanding of key organizational processes that influence change, such as power, reward systems, decision-making, information systems, and structural designs.

A few texts have emerged to cater to organizations that wish to adopt self-assessment processes (Manzini 1988, Mohrman and Cummings 1989, Hakes 1995, Wilson and Pearson 1995). One feature of these frameworks has been the prescription for periodic or routine
assessment programs. Indeed, scholars have suggested that periodic organizational assessments can provide a stream of feedback on organizational functioning. This could be particularly valuable for developing internal capacity to critically assess data on their organization’s operations in light of managerial, social, technological, and economic changes (Nadler, Mirvis, and Cammann 1977, Torbert 1981, Wildavsky 1972).

While theorists appear to recognize the possibility and potential benefits of organizational self-assessment, formal research that has explored the development and use of self-assessment processes inside organizations has been remarkably thin.

Beer and Eisenstat (1996) suggested that a crucial problem in implementing diagnostic processes in organizations was that a research-based social technology for organizations did not exist. Although researchers have developed diagnostic frameworks, there has been very little process specified by which managers and employees can actually engage in organizational diagnosis and change. These primarily social processes are deemed appropriate for the organization in order to actually employ diagnostic models systematically. The problem becomes one of how to institutionalize the self-assessment process in the organization.

Beer and Eisenstat (1996) provided one of the few formal studies of organizational efforts to develop and institutionalize a diagnostic self-assessment process. The research consisted of a single case study of the development and implementation of a process providing an organization with the on-going capacity to self-diagnose and address strategy development and implementation problems.

The self-assessment methodology was developed by the researchers, and then installed collaboratively with the organization’s senior managers. Beer and Eisenstat (1996) found that, after some initial successes, ongoing benefits accrued from the self-assessment process were mixed. Although the organization appeared to benefit from annual assessments of the strategic planning processes, the processes were not being used to systematically investigate problematic findings that surfaced during the self-assessment. Indeed, the researchers suggested that a critical
factor that tempered the self-assessment process’s effectiveness was the failure of managers to routinely review data obtained from a particular assessment event, and to follow-up on the problematic data uncovered as part of the analysis.

2.3 Strategic Management Literature

2.3.1 Research on strategy implementation

Nadler and Tushman (1989) argued that “strategic” change was large-scale change that impacted most of the organization and frequently was aimed at re-orienting the organization’s direction. Intel Corporation’s company-wide shift from random access memory to microprocessor markets in the early 1980’s is a classic example of strategic change (Grove 1996). In the strategic management literature, such large-scale planned change is studied as an outcome of strategic planning process.

It has been frequently acknowledged that the literature on strategy development (for seminal work see Ansoff 1965, Andrews 1971, Hofer and Schendel 1978, Porter 1985) significantly outweighs the literature on strategy implementation. Analytically, strategy development has usually been viewed as separate from implementation, although scholars have noted that the two constructs are not easily separable in reality (Lindblom 1959, Mintzberg 1978, Quinn 1980).

The importance of strategy implementation in achieving competitive advantage has been recognized (e.g., Egelhoff 1993). Observers suggest that strategic failure frequently relates to problems with implementing strategy rather than to poor strategy choice (Hambrick and Cannella 1989, Beer, Eisenstat, and Spector 1990). As one researcher stated, “it has been recognized for many years that implementation is frequently the graveyard of strategy.” (Grundy 1998: 43)

Despite the recognized importance, scholars have consistently cited the need for more research on strategy implementation and its relationship to performance (e.g., Ginsberg 1988, Dean and Sharfman 1996, Noble 1999). However, much of the strategy implementation literature
remains conceptual (e.g., Hrebeniak and Joyce 1984, Galbraith and Kazanjian 1985), and favors normative frameworks derived from empirical observation and consulting (e.g., Hambrick and Cannella 1989, Tushman and O’Reilly 1997).

Formal implementation research has focused on a few areas. One theme relates to the characteristics, styles, or tactics of managers when implementing strategic decisions (e.g., Govindarajan 1984, Gupta and Govindarajan 1984, Bourgeois and Brodwin 1984, Mitroff 1983). Nutt (1986, 1987, 1989), for example, focused on how managers employed tactics related to intervention, participation, persuasion, and edict when implementing strategic plans. The most effective tactic depended on various contingencies such as time pressure and managers’ freedom to act. Waldersee and Sheather (1996) found that the context of strategy (whether an organization pursued an entrepreneur or conservative strategy) influenced the manager’s choice of preferred influence tactics as well as the target people and organizational functions that they would involve in the implementation effort.

Another significant area of strategy implementation research has related to middle management’s involvement in implementation (e.g., Guth and McMillan 1986, Wooldridge and Floyd 1990). The focus of this work has been the relationship between middle management’s inclusion or exclusion from the strategy formulation process, and the consequential effects on realized strategy and performance outcomes.

A constraint to progress in implementation research relates to problems with converting abstract strategy constructs such as Porter’s (1985) differentiation and cost leadership strategies into more concrete, measurable terms. Some researchers have addressed this difficulty by focusing on the shorter-term plan, which typically takes the form of an implementable decision. For example, Nutt’s (1986, 1987, 1989) work cited above used a specific strategic decision to be implemented as the unit of analysis.

Miller (1997) investigated 11 decisions in 6 organizations in search of the factors that influenced the success of the implementation of the decision. Similar to Nutt’s (1986, 1987,
1989) work, Miller’s unit of analysis was the strategic decision. Although a strategic decision is generally considered to be broad in scope and impact on the organization (Mintzberg, Raisingham, and Theoret 1976, Hickson et al. 1986, Nadler and Tushman 1989), the decisions analyzed in Miller’s study varied in scope, from merger/acquisition to changes in computer systems and location.

Miller’s (1997) study represents one of the few in-depth inquiries into the characteristics of strategy implementation processes. She found four key factors associated with success. The factors were the degree of backing by senior managers, clear specification of the actions to be taken during implementation, cultural receptivity to the change, and the degree to which the success of implementation can be evaluated with precision (assessability) to assess the change’s impact.

2.3.2 Measuring the success of strategic change

Miller’s (1997) final success factor noted above, assessability, again suggests the chronic problem of measuring implementation. In Miller’s study, the construct was developed qualitatively through interviews with managers.

Measures of implementation success were also derived from responses to structured questions, such as:

- How long was implementation expected to take? How long did it actually take? Was there a deadline?
- How far was the decision implemented? (1=not implemented, 5=completely implemented)
- How far was the decision implemented as intended? (1=not at all, 5=wholly)
- How far did implementation succeed in achieving what was intended? (1=completely unsuccessful, 5=completely successful)
- Have there been any unintended consequences of the decision? What were these and why did they occur?
- How far were you generally satisfied with what was done and the way things were done? (1=not at all, 5=wholly) (p. 597-598)

Miller (1997) distinguished three features of implementation success: completion, achievement, and acceptability. Completion was the degree to which everything intended was done within the expected time period. Achievement was the degree to which what was done
performed as intended. Acceptability was the degree to which the method of implementation and outcomes were satisfactory to those involved in, or affected by, the implementation.

2.4 Project Management Literature

2.4.1 Managing change as managing a project

At its essence, the core role of project management is to deliver a specific result in a particular period of time and at a particular cost (Grundy 1998: 43). Indeed, classic project management structure is built around the notion of a project that has a definable scope and duration (e.g., Turner 1993).

The conceptual ease by which projects can be defined and managed differs sharply from the abstraction and complexity typically embedded in a strategy that must be implemented. Strategy scholars have noted that strategy rarely proceeds neatly from policy formulation to implementation (Lindblom 1959, Mintzberg 1978, Quinn 1980). In addition, the ongoing rollout of large-scale compound change in organizations, and the complexity of change content (Nadler and Tushman 1989), appears to make the neatly packaged project management structure inappropriate to managing many large-scale organizational changes.

The definable nature of projects fits the research approach of using the executable decision as the unit of analysis. Miller’s (1997) study of 11 change implementations included themes such as switching to a new computer system, change of location, and consummating a merger. Most of these changes had definable scopes and in many ways resemble the classic themes of project management.

A number of scholars have observed the potential power of using project management structure to implement strategic change (Juran 1989, Lord 1993, Pellegrinelli and Bowman 1994, McElroy 1996). A useful notion from this literature relates to elaborating abstract, high-level strategy (e.g., “be the low cost producer” or “generate higher return on assets”) as a set of concrete projects with definable scope. Grundy (1998) termed this the ‘strategic project set.’ An
example of the strategic project set appears in Figure 2.1. A possible end-point for the strategic project set exercise might be the point when the distilled projects have a clearly measurable outcome.

**Figure 2.1: Example of Strategic Project Definition (Adapted from Grundy 1998)**

- **Strategic turnaround**
  - Resolve channel conflict
  - Reduce cost base
  - Strategic turnaround

- **Drop channel**
  - Refocus distribution channel
  - Re-train sales force
  - Drop channel

- **Push marketing strategy**
  - Product range simplification
  - Process simplification
  - Reduce working capital
  - Reduce manufacturing sites

- **Product parts simplification**
  - Process automation
  - Just-in-time systems
  - Focused manufacturing

Project management researchers have been proposing and evaluating various structures for project evaluation and control. Similar to the three phases of change noted above, projects can also be viewed as passing through three phases: pre-project, ongoing activities, and post-project (Cleland 1985). Of the project evaluation frameworks proposed, most fall into the ongoing activities phase. However, these frameworks tend to be either highly conceptual (e.g., Loo 1985, Cleland 1985, Saunders 1992, Kotnour 1999) or developed and tested for a single situation (e.g., Lukas 1994).

Although the definable nature of projects suggests that project implementation should be easier to evaluate than a strategy implementation, project researchers still cite measurement difficulties. Difficulties with measuring project implementation generally relate to quantifying
non-financial dimensions (Lopes and Flavell 1992), such as the impact on the client (Winch, Usmani, and Edkins 1998), quality (Kumar and Wolf (1992), or the project’s contribution to strategy realization (Levasseur 1993). Another reason may relate to the context for a particular project evaluation system. Contextual factors also complicate project evaluation. For example, Might (1984) found that choice of a project control system related to the project’s specific implementation situation.

2.5 Top Management Consensus Literature

2.5.1 Conceptual foundations of consensus

Top management teams are common enactments of the theoretical constructs of the dominant coalition (Cyert and March 1963) and the upper echelon (Hambrick and Mason 1984). Senior managers affect organizational activities and performance in large part through the decisions or strategic choices they make (Hambrick and Mason 1984).

Consensus has been examined as a process in, and as a consequence of, decision-making. Ginsberg (1990) described consensus as the socio-cognitive capacity to synthesize diverse opinions into a shared understanding, which helps the top management team interpret its environment. The proposition that pervades the consensus literature is that agreement among senior managers about strategic issues relates to organizational performance. Top management team consensus has been thought to contribute to a necessary integrated logic and basis for action within the organization (Hambrick 1997). Senior executives that independently pursue their own objectives embody a fragmented top management team, which is thought to impair performance and adaptability (Hambrick 1995).

2.5.2 Empirical research on consensus

Three common constructs in this literature stream relate to management’s agreement on the goals of the organization, agreement on the means necessary to achieve the goals, and reflective measures of organizational performance. In one early study of the relationship between
these constructs, Bourgeois (1980) found a significant correlation between the degree to which management teams agreed upon the methods their firms were using to compete (the means) and the firm’s performance, but no correlation between agreement on goals and performance.

Scholars have adjusted consensus theory to account for a mixture of findings in subsequent empirical investigations. Wooldridge and Floyd (1989) proposed that variations in strategic process helped explain whether consensus was positively or negatively related to firm performance. For example, a firm that is reevaluating its strategy may not exhibit strong top management team consensus. Priem (1990) also questioned the direct relationship between consensus and performance. He proposed possible antecedent variables related to top management team composition and structure, and possible intervening variables such as industry effects to the mix. Certain configurations of these models have been proposed for further study (Priem 1990, Dess and Priem 1995).

Ongoing investigations continue to yield mixed findings. West and Schwenk (1996) found no significant relationship between goals consensus, means consensus, and firm performance variables after controlling for team demographics variables and industry stability variables. Conversely, Iaquinto and Fredrickson (1997) found that top management team agreement about the consequences of its strategic decision process was positively related to performance. They also found that top management teams from smaller organizations tended to exhibit more agreement that did teams from larger firms. Knight et al. (1999) found evidence that adding variables representing how the top management team dealt with interpersonal conflict and agreement-seeking contributed to strategic consensus, although no relationship with performance was examined.

Katzenbach (1997) argued that, unless certain conditions are present, it makes little sense for senior managers to work together as a team. First, the team must be able to positively influence organizational performance results as a group beyond a level possible by individual effort. Second, different members of the team need to be able to accept the leadership role,
depending on the task and hand. Third, members of the team must be mutually accountable for the group’s results. Deviations from these conditions suggest that the organization would actually benefit from less teamwork at the top and from more individual effort from managers.

The persistence of this research stream suggests a strong desire among scholars to find relationships between top management team consensus and firm performance. Unfortunately, results to date have been equivocal. Smith and Kofron (1996) argued that an important flaw in top management team research design has been failure to consider the intervening steps of implementation on achieving strategic goals. Certainly, Mintzberg (1978) and others have noted that there is usually a difference between strategic choice (intended strategy) and the actual outcome (realized strategy).

The relative dearth of research on strategy implementation relative to strategy formulation has been noted above. Smith and Kofron (1996) added that there is virtually no work linking top management teams with strategy implementation processes. This is despite conventional wisdom that top managers spend a significant portion of their time engaged in routine activities such as communication, evaluating, and controlling (Barnard 1938, Newman 1940, Mintzberg 1973, Kotter 1982)—activities that appear strongly associated with implementing strategic change.

Behavior of top management teams in relationship to implementing strategic initiatives remains largely unexplored.

2.6 Organizational Learning Literature

2.6.1 Important learning concepts

Learning can be viewed as the detection and correction of error, where error is a mismatch between intentions and what really happened (Argyris 1989: 5). Organizational learning can be defined in terms of the organizational capacity to maintain or improve
performance based on experience (Fiol and Lyles 1985, Nevis, diBella, and Gould 1995: 73). In this sense, organizations learn by doing.

Although recent emphasis has highlighted the desirable, somewhat unique status of the “learning organization” (e.g., Senge 1990), many believe that all organizations engage in collective learning as work progresses (Child and Kieser 1981, Schein 1993).

One of the conceptual fundamentals in the organizational learning literature is the difference between single- and double-loop levels of learning (Argyris and Schon 1978). Single loop learning is the most common level of learning, and basically entails abilities to perceive deviations from perceived performance and “fix” them. Double-loop learning is more sophisticated, since the organization must review the underlying assumptions that created the problem to be “fixed” in the first place, and adapt a better set of assumptions to support future performance. It is generally thought that double-loop learning is a desirable organizational capability in complex, changing environments that require quick response.

There is general agreement in the literature that the general organizational learning sequence involves the creation, sharing, and application of knowledge (Argyris and Schon 1978, Huber 1991, Nevis et al. 1995).

Nevis et al. (1995) proposed a three-stage model to describe the process of organizational learning. Knowledge acquisition relates to the development of skills, insights, and relationships. Knowledge sharing relates to the processes for disseminating what has been learned. Knowledge utilization relates to how the organization processes and applies learning to new situations.

2.6.2 Characteristics of learning organizations

Nevis et al. (1995) identified a number of factors that facilitated the degree of learning in organizations (Table 2.2). These factors are potentially useful to this investigation, since they suggest certain characteristics that might lead the organization to use a self-assessment model.
Table 2.2: Facilitating Factors of Organizational Learning (Adapted from Nevis et al. 1995)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Representative Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning imperative</td>
<td>Information gathered about conditions and practices outside the unit; awareness of the environment; curiosity about the external environment in contrast to the internal environment.</td>
</tr>
<tr>
<td>Performance gap</td>
<td>Shared perception of a gap between actual and desired state of performance; performance shortfalls seen as opportunities for learning.</td>
</tr>
<tr>
<td>Concern for measurement</td>
<td>Considerable effort spent on defining and measuring key factors when venturing into new areas; striving for specific, quantifiable measures; discussion of metrics as learning activity.</td>
</tr>
<tr>
<td>Experimental mind-set</td>
<td>Support for trying new things; curiosity about how things work; ability to “play” with things; “failures” are accepted, not punished; changes in work processes, policies, and structures are a continuous series of learning opportunities.</td>
</tr>
<tr>
<td>Climate of openness</td>
<td>Accessibility of information; open communications within the organization; problems/errors/lessons are shared, not hidden; debate and conflict are acceptable ways to solve problems.</td>
</tr>
<tr>
<td>Continuous education</td>
<td>Ongoing commitment to education at all levels of the organization; clear support for all members’ growth and development.</td>
</tr>
<tr>
<td>Operational variety</td>
<td>Variety of methods, procedures, and systems; appreciation of diversity; pluralistic rather than singular definition of valued competencies.</td>
</tr>
<tr>
<td>Multiple advocates</td>
<td>New ideas and methods advanced by employees at all levels; more than one champion.</td>
</tr>
<tr>
<td>Involved leadership</td>
<td>Leaders articulate vision, are engaged in its implementation; frequently interact with members; become actively involved in educational programs.</td>
</tr>
<tr>
<td>Systems perspective</td>
<td>Interdependencies of organizational units; problems and solutions seen in terms of systemic relationships among processes; connection between the unit’s needs and goals and the organization’s.</td>
</tr>
</tbody>
</table>

2.6.3 Learning process

Scholars have found that managers can promote learning by enriching the mix of inputs to decision making. For example, assessing a variety of stakeholder perceptions during goal development can contribute to organizational learning and decision viability (Lawler and Galbraith 1994). Seeking a broad mix of inputs also fosters permeable boundaries across which information from diverse viewpoints flows (Ashkenas et al. 1995).
Organizational learning is enhanced when people gather for “dialogue.” Dialogue is defined as a sustained collective inquiry into the processes, assumptions, and certainties that compose everyday experience (Isaacs 1993). Various group structures promote dialogue. A “community of practice” represents members of an occupational group or team who share their experiences in ongoing dialogue (Brown and Puguid 1991). The groups do not necessarily need to be homogenous. Indeed, Lave and Wenger (1990) proposed the organizational skill of “legitimate peripheral participation” that relates to organizational learning by providing people with the opportunity to mingle with upper level management and see them in action.

An important consequence of effective organizational dialogue is to reduce or eliminate “defensive routines” (Argyris 1985). A defensive routine is a policy, practice, or action that prevents people involved in a group activity from being embarrassed or threatened, and, at the same time, prevents people from learning how to reduce the causes of embarrassment or threat. The consequences of defensive routines on strategy development and implementation have been discussed by Janis (1989). Argyris (1989) reported the results of an experiment where executives learned to overcome defensive routines by engaging in dialogue that forced the managers to articulate their underlying assumptions and reservations about particular strategic decisions to be implemented in their organizations. After the experiment, most managers reported that their strategies were being implemented more effectively.

Isaacs (1993) suggested that, due to our increasing theoretical knowledge of the phenomenon of dialogue and its effect on organizational learning, managers needed to acquire some new skills and disciplines. Managers require skill in arranging environments in which dialogue can take place. Managers need to value power of collective observation and patterns of collective thought that typically go unnoticed.

2.6.4 Mutual learning

Another organizational learning configuration is possible by establishing learning structure between organizations rather than within an organization. This variant in organizational
learning has been termed mutual learning or collaborative learning (Shiba, Walden, and Graham 1993, Burchill, Gomez, and Walden 1996). The notion stems from the rapid learning commonly observed in inter-organization groups that gather to develop new managerial technologies or to solve common problems. Frequently these groups include participants from academia. The consequence of this rapid learning appears to be the broad adoption and use of the technologies and solutions delivered by the collaborative “study groups.”

2.7 Managerial Control Literature

2.7.1 Concepts of managerial control

Like many terms, control is a word that can cause confusion if not precisely defined. Rathe (1960) uncovered fifty-seven connotations of control in the literature. To better define managerial control, consider the following prominent perspectives:

The process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization’s objectives. (Anthony 1965: 17)

A system to support managers in assessing the relevance of the organization’s strategy to its progress in the accomplishment of its goals, and, where discrepancies exist, to support areas needing attention. (Lorange, Scott Morton, and Goshal 1986: 10)

The formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities. (Simons 1995: 5)

The salient features of the managerial control construct include (1) the formality or routinization of the control process, (2) information as the critical input, (3) senior managers as the primary users, (4) the primary objective as determining whether to maintain or change organizational activities.

2.7.2 Diagnostic control systems

2.7.2.1 Basic diagnostic control concept

The most common type of management control system is the diagnostic control system. Most of the literature on management control systems focuses on diagnostic control systems.
Typical examples of diagnostic control systems in organizations include profit plans and budgets, management by objectives systems, standard cost accounting systems, and project management systems (Simons 1995: 61).

The basic function of a diagnostic managerial control system is to allow managers to keep things on track. (Merchant 1985: 1). A diagnostic control system provides managers with a framework for identifying pertinent control variables, developing suitable short term plans, measuring the level of fulfillment of the plans against the set of control variables, and diagnosing the deviations (Lorange and Scott Morton 1974).

In the context of strategic management or large-scale program management, theorists claim that a diagnostic control system provides essential structure for implementing decided-upon programs (Anthony 1965, Lorange and Scott Morton 1974, Merchant 1985). Control targets and variables, extracted from program plans, are used to monitor the organization’s compliance with achieving the program.

For diagnostic control systems to control any process, it must be possible to (1) develop preset standards or goals for the process’s output, (2) measure the output, (3) correct deviations between the output measure and the standard (Lawler and Rhode 1976, Otley and Berry 1980, Merchant 1985). The common representation of the diagnostic control system appears in Figure 2.2.

2.7.2.2 Measurement and evaluation in diagnostic control

Considerable attention has been directed at determining critical organizational variables and measuring outcomes. Much of the diagnostic managerial control literature has been grounded in financially based outcome measures. Sometimes called financial accountability control (Merchant 1985), this type of system holds managers accountable for results defined in monetary terms—such as sales, profits, return on assets, etc. A classic example of this approach can be seen in Brown’s (1977: 129) desegregation of return on investment into a number of financial indicators.
However, the concept of critical performance variables has gradually broadened to include non-financial variables such as market share, customer satisfaction, product quality, and service. Lorange and Scott Morton (1974) concluded that measures relating to such factors as quality were crucial to the effectiveness of a diagnostic managerial control system. Although these variables were non-financial, their strategic importance and their ability to closely reflect actual operating processes made them attractive variables for diagnostic managerial control systems.

Kaplan and Norton (1992) captured the interplay between financial and non-financial diagnostic control measures through their balanced scorecard concept. They grouped diagnostic control system measures into four categories: financial, internal business, customer, and innovation and learning. By measuring and controlling variables in each of these four areas, managers supposedly maintain a broader, more systematic perspective deemed necessary when managing and controlling strategic change.

2.7.2.3 Managerial attention as a scarce resource

From the manager’s perspective, a diagnostic control system reduces the amount of oversight required for achieving organizational objectives. Large numbers of opportunities present themselves to the organization, but the organization cannot attend to them all simultaneously (Cyert and March 1963). Attention, the allocation of information processing
capacity to a defined issue or agenda, is a scarce organizational resource that often constrains the organization’s ability to exploit available opportunities (Simon 1976).

A diagnostic control system conserves management attention since it permits management-by-exception (Simons 1995). Management typically spends little time with them, except during situations when deviations from the goal are large. At this point, attention and resources must be dedicated to bring performance back in line.

2.7.2.4 Difficulties with diagnostic control systems

Despite the compelling theoretical evidence that suggests the widespread use of diagnostic control systems, empirical evidence continues to suggest that managers fail to effectively use them. For example, a recent *FORTUNE* article presented some compelling anecdotal evidence that connected ignorance of the three key areas of diagnostic control system attention—setting goals, monitoring progress, and following up on deviations—with senior executive failure (Charan and Colvin 1999).

A Coopers & Lybrand survey of 225 US and Canadian firms found that, of all practices utilized for managing strategic change, the extent to which the progress of change initiatives were measured scored the lowest (Carr, Hard, and Tranhant 1996: 236-237). Since measurement is critical to an effective diagnostic managerial control system, these results indicate that firms frequently do not connect large-scale organizational change to diagnostic control systems.

Simons (1995) offered three conditions under which a diagnostic control system may not be effective. First, a diagnostic control system may be difficult to implement if managers cannot visualize the types and quantities of outputs that are desired. For instance, diagnostic controls can be hard to implement in an innovative environment, such as an R&D setting.

Second, diagnostic control systems are difficult to implement in situations where the output is not easily measurable. For instance, changes to the organization’s culture, while perhaps highly desirable, may not readily fit the diagnostic control model, since measurement of culture can be difficult.
Finally, in order to correct deviations from target, organizational participants must be able to influence the process and its outcomes. It makes little sense, for example, to make low-level supervisors accountable for company-wide earnings per share due to the supervisors’ limited ability to influence corporate-level financial performance. Rights to make decisions that result in effective control of change must be allocated to the appropriate levels or individuals in the organization (Fama and Jensen 1983, Wruck and Jensen 1994)

2.7.3 Interactive control systems

Scholars generally perceive a tradeoff between the constructs of innovation and control (Burns and Stalker 1961). The general thought is that the stable structure required for ensuring organizational objective achievement stifles the more fluid structure required for the organization to remake itself in a dynamic environment. Simons (1995) suggested that a different type of managerial control system, the interactive control system, assists managers in identifying situations that require the organization to reset its strategic direction.

Interactive control systems have four defining characteristics (Simon 1995: 97). (1) Information generated by the system is an important and recurring agenda addressed by the highest levels of management. (2) The interactive control system demands frequent and regular attention from operating managers at all levels of the organization. (3) Data generated by the system are interpreted and discussed in face-to-face meetings of superiors, subordinates, and peers. (4) The system is a catalyst for the continual challenge and debate of underlying data, assumptions, and action plans.

Such a system has features of a double loop learning mechanism (Argyris and Schon 1978) since it promotes organizational members at various levels to interact and frequently question their assumptions that drive daily activities.

Systems designed for other purposes often double as an interactive control system. In a study of 30 health care products businesses, Simons (1991) found that senior managers typically
used a number of systems interactively, including project management systems, profit planning systems, brand revenue budgets, intelligence systems, and human resource systems.

Simons (1995) argued that managers should use few systems interactively. Interactive control systems impose significant costs, since more managerial attention must be allocated to interactive systems in comparison to diagnostic systems. Interactive control systems also tend to deliver higher quantities of complex information that challenges managerial capacity to process it effectively. Finally, the most effective system to be used interactively typically depends on the organization’s strategy; a profit planning system may a poor choice for an interactive control system in the when a firm’s strategy dictates a short term horizon—such as when the firm competes by quickly imitating rivals’ activities.

2.8 Summary of Literature Review

*Many change models with some face validity...*

Models play a significant role in organizational assessments (Hausser 1980), including assessments related to the management of change (Nadler 1980a). Many change models exist (Burke 1995). Many of these models contain common elements. Many models elaborate Leavitt’s (1965) dimensions of people, task, structure, and technology (e.g. Weisbrod 1976, Nadler and Tushman 1980, Burke and Litwin 1992). Few of these models have undergone rigorous validation. Rather, many models have undergone validation-in-use as tools in action research and consulting activities (e.g., Weisbrod 1976, Kotter 1978, Tushman and O’Reilly 1997). The sheer volume of models in use suggests that either no single model is superior, and that the usefulness of a particular model is highly contextual.

*Few models that specifically reflect change implementation...*

Despite the number of change models developed, few models elaborate the process of change implementation. This is important for us, since the assessment of change implementation is a substantive focus of this investigation.
Assessment is commonly viewed as an antecedent to change...

Most research on assessment and change follows the “assess-then-change” sequence (Lawler et al 1980, Beer 1980, McClennan 1989). Assessment is viewed as an antecedent to change (Nadler 1976, 1980b). There is little research of assessment’s role during or after the implementation of planned change.

Thin literature on self-assessment...

Although scholars have recognized the concept of self-assessment, there has been little empirical research on the phenomenon (Tichy and Hornstein 1980). Rather, the organizational assessment and change management literatures focus on the strong role played by the outside expert or consultant in diagnostic assessment and change (e.g., Lawler et al. 1980). Self-assessment may promote adoption of change (Bennis, Benne, and Chin 1962, Beckhard 1969, Clark 1976), quick turnaround of assessment findings (Tichy and Hornstein 1980), and organizational self-analysis and criticism (Harrison and Shiron 1999). Beer and Eisenstat (1996) provided one of the few empirical investigations of an organization involved in self-assessment in the change management context.

Importance of implementation acknowledged, but research lags...

Many researchers have acknowledged the link between effective implementation and performance (e.g., Ginsberg 1988, Hambrick and Cannella 1989, Beer Eisenstat, and Spector 1990, Eglehoff 1993, Grundy 1998). However, change implementation research has chronically lagged research efforts in change determination (Noble 1999). This is particularly true in the case of large-scale planned change, such as the change required in strategic initiatives (Smith and Kofron 1996).

Measuring and evaluating implementation is a chronic problem...

A widely cited problem in implementation research has been difficulty with measuring the effects or outcomes of organizational change. This problem is noted in every literature stream linked to implementation, including organizational assessment, change management, strategy
implementation, managerial control, and project management. Large-scale strategic change aggravates the problem, since the abstract themes of strategic change can rarely be tied directly to an outcomes measure (Grundy 1998). To address this problem, some researchers disaggregate large-scale change into individual “strategic decisions” as the unit of analysis. The scope of these decisions is more defined and resembles what is commonly considered a “project” in the literature (Cleland 1985, McElroy 1996, Grundy 1998). Nutt (1986, 1987, 1989) and Miller (1997) provide examples of using this approach to evaluate implementation of strategic change.

A link between top management consensus and implementation is possible...

Research on top management consensus suggests a relationship between the degree of senior executive agreement on strategic objectives and organizational performance (Cyert and March 1963, Hambrick and Mason 1984, Hambrick 1997). Verification research has not conclusively confirmed this link (e.g., Bourgeois 1980, Priem 1990, West and Schwenk 1996, Iaquinto and Fredrickson 1997). This work, however, has largely focused on variables related to the determination of strategic direction and performance—it has virtually ignored the vital role of implementation as a moderator between change formulation and results. Research that examines the relationship of top management consensus on change implementation is necessary but rare (Smith and Kofron 1996).

Organizational learning may improve implementation...

Organizational learning is facilitated when structure is present for collective dialogue among organizational members (Brown and Puguid 1991, Isaacs 1993). A favorable consequence of collective dialogue is the surfacing and diminishing of individual defensive routines that typically impede organizational change (Argyris 1985, 1989). Learning between organizations can occur when members from various organizations gather to solve common problems. This learning mode has been referred to as mutual or collaborative learning (Shiba et al. 1993). An outcome of mutual learning appears to be the rapid adoption and use of technologies or solutions developed from the collaborative efforts (Burchill et al. 1996).
A number of organizational factors facilitate organizational learning...

Nevis et al. (1995) identified a number of factors that, when present, facilitated organizational learning. These factors include a scanning imperative, perception of a significant performance gap, concern for measurement, experimental mindset, climate of openness, commitment to ongoing education, involved leadership, and a systems perspective.

Change implementation and evaluation relates to managerial control...

Evaluating and monitoring the implementation of a change has been widely cited as a key activity of the change management process (Kilmann and Herden 1976, Kotter and Schlesinger 1979, Hunsucker and Loos 1989, Nadler and Tushman 1989, Tushman and O’Reilly 1997). The literature on managerial control systems promises useful insight into the processes of evaluation, monitoring, and control. Managerial control systems constitute the information systems used by managers, usually senior executives, to ensure the organizational objectives are achieved (Anthony 1965, Merchant 1985, Simons 1995). Surprisingly, there has been little cross-dialogue between the managerial control literature and the various research streams concerned with change management.
Chapter 3: The Conceptual Change Process Model

3.1 Introduction and Guiding Propositions

In this chapter, we define and begin to validate a conceptual model of change process for use in organizational self-assessments. A basic question when developing a model used for assessing change is: When evaluating the change process, what gets assessed? Understanding the model’s content and validity is an important early step in building broader theory on self-assessment and its relationship to change management.

Nadler (1980a: 126) noted that the literature on theory construction and research (e.g., Kaplan 1964, Argyris and Schon 1974) articulates some desirable characteristics of assessment models:

- **Explicit.** An assessment model needs to be stated and described in order to test and evaluate the model against competing models.
- **Theory-based.** Organizational assessment models should display characteristics of scientific thought by being linked to the scientific literature. Other things being equal, to employ a model that is inconsistent with what is known about organizational phenomena would be foolish.
- **Operationally defined.** Models should specify constructs, variables, relationships, and effectiveness criteria in terms of the operations needed to measure them. The specificity is needed to ensure that elements of the model are not misinterpreted, misconstrued, or misperceived by those who use the model or attempt to test its validity.
- **Empirically validated.** Models need to be tested to determine whether the network of relationships specified do indeed represent what is observed in actual settings. This testing needs to be done through analysis of these data in the light of possible rival hypotheses or explanations.
• **Face validity.** To the extent that models are used as a device to communicate results or facilitate the understanding of assessment findings, models need a minimum degree of face validity. If the propositions and relationships of the model do not make any sense in light of day-to-day experiences of organizational members, resistance to findings may develop. Where relationships are counterintuitive, explanations and educational processes need to be developed if the model is to be an effective communications tool.

• **Generalizability.** A model needs to apply over a range of settings. At the least, the generalizability of a model needs to be assessed or tested so that appropriate models will be used in different settings, so that models will not be applied beyond the limits of their external validity.

Few models of organizational assessment have been documented in a manner that indicates attainment of all these criteria. Nonetheless, these criteria serve as a useful checklist to guide efforts to develop a valid organizational assessment model.

In this chapter, we define and elaborate the change model expressed by the CQM study group (the “CQM model”). Since the CQM model was empirically derived, we describe the context in which the model was developed. Unlike the scholar’s approach of elaborating a conceptual, literature-based theoretical narrative prior to operationalizing the model with a measurement instrument, the CQM model is expressed mainly through the survey instrument itself. We use empirical evidence such as the survey document to induce the theory (Glaser and Strauss 1967) implied by the study group’s work.

We also examine the model’s validity. First, we are interested in how well the empirically derived CQM model aligns with scholarly theory on change implementation (content validity). Second, since the model is a “hands-on” one—designed for use by organizations—it must accurately represent reality as perceived by practitioners (face validity). Third, the survey-based measurement model must be reliable and accurately distinguish the key constructs that underlie the model (construct validity). Finally, a model of change process, such as the CQM
model, must adequately predict or relate to the key outcome of interest, namely the achievement of change (criterion-related validity).

In this chapter, we focus primarily on establishing the degree of content validity and face validity of the CQM model. In Chapter 4, we will address the construct and criterion validity issues associated with the measurement model.

The essential theoretical propositions that guide our work in this chapter and the next are as follows:

**Proposition 1**: A model for assessing the change process includes constructs related to determining the change, structuring the organization to support the change, developing the necessary skills, promotion, sharing successes associated with the change, managing people's behavior, and monitoring and diagnosis to control the change’s implementation.

**Proposition 2**: The higher the levels of change process variables, the higher the level of change achievement.

At the end of Chapter 4, we will return to these two propositions and evaluate their legitimacy.

3.2 The CQM Model Development Process

3.2.1 Background on CQM

The impetus for this investigation stemmed largely from a project initiated by the Center for Quality of Management (CQM) to develop methodology for managing change. Based in Cambridge, Massachusetts, the Center for Quality of Management is a not-for-profit international consortium of over 100 organizational affiliates that are committed to the development and diffusion of improved management practices.

A distinguishing feature of the CQM structure is the active participation of senior executives in setting and achieving the consortia’s objectives. Senior managers from CQM organizations meet routinely to discuss common problems and to develop collaborative ways to solve these problems.
Two key processes dominate CQM activities. One process is the diffusion of codified knowledge via training programs. Member organizations subject a large number of their employees to CQM training programs in such areas as structured problem solving, long-range planning, and customer-driven product development. The second process is the development of new knowledge by conducting applied research on topics targeted by senior managers of CQM organizations.

The “study group” represents the administrative structure for developing this new knowledge. A study group is composed primarily of managers from member organizations. Some managers volunteer to participate on the study group; some managers are appointed by their member organizations. The group also includes a facilitator from CQM headquarters and, usually, a participant from a local university. In some ways, the team structure resembles the classic cross-functional project team prescribed by Juran (1989) to solve chronic organizational problems. A key difference here, of course, is that team members hail from different organizations, rather than from different functions within the same organization.

CQM study groups have produced, or are currently producing, deliverables that address a variety of organizational issues deemed important to CQM member organizations. Some areas of study have included product development, managerial decision-making, and strategic planning. The deliverables are codified methodologies that are converted into training programs for diffusion among CQM member organizations.

3.2.2 Action research style
The research strategy employed by CQM study groups resembles the notion of “action research” frequently attributed to Lewin (1946, 1951). Marrow (1969) cited six characteristics of action research. First, the research project is usually motivated by an empirical problem. Second, the findings are directed towards satisfying the client sponsoring the research project. Third, the research challenges conventional thinking about the substantive problem. Fourth, the research
produces confirmable propositions. Fifth, the findings of the investigation are systematically
inter-relatable into a theory. Sixth, the results are useful in everyday organizational life.

Argyris (1968, 1980) recognized the difference between the action research style and
more conventional research styles typically employed by normative scientists seeking “rigor.”
Generalizations obtained from action research tend to be less specific and precise than those
obtained from normal science methods. However, the generalizations tend to capture the
wholeness of a problem by capturing a pattern of variables whose validity is tested by seeing the
degree to which actors can use the model to produce accuracy (or to be effective) under on-line
constraints (Argyris 1980).

The research conventions that govern the practice of normal science can limit the
usefulness of experimental results. Using normal science methods, precision and validity can
usually be achieved only at the expense of genuine applicability under on-line conditions (Argyris
1980). Further, normative scientists tend to assume that organizations are closed systems.
Research is deliberately undertaken to satisfy researcher’s needs and to provide maximum control
of subjective behavior (Argyris 1968).

Given these limitations, the suitability of normal science methods in organizational
research has been questioned by a number of scholars, particularly social scientists. The
assumptions, generalizations, and simplifications inherent in normative methods may not
realistically fit the socially complex situations of the empirical world (Denzin 1978). Since
organizational functions and activities are always mediated by the interactions of people, the
organization can never escape its human processes (Homan 1978). These human processes,
however, are difficult to model parsimoniously in a manner that befits normative research. To
assume the interactive complexity away for the sake of parsimony may not be desirable,
particularly in research concerned with implementing change in organizations (Schein 1969).
The empirically driven action research style addresses some of the limitations of normal science methods. Action research aims to contribute to the practical concerns of people in an immediate problematic solution and to the goals of social science by joint collaboration within a mutually acceptable ethical framework (Rapoport 1970). This style of research provides organizations with realistic findings for solving substantive research problems, while providing the researchers with a body of concrete phenomena that facilitates theoretical study underlying social processes (Lewin 1951, Homan 1978).

These characteristics of action research are important, since they provide some insight about the orientation of the study group as they pursued their research question, and the influence of this orientation on the resulting CQM model. In the next section we elaborate how the action research approach was deployed to generate the CQM model.

3.2.3 CQM model development process

The study for developing change management methodology for CQM member organizations began its work in November 1998. Over the life of the project, approximately 20 managers actively contributed to the study group project. Most of these people were middle- to upper-level managers with functional responsibilities in operating or quality related areas. At any one time, a group of six to 8 people were actively involved, meaning that many contributors cycled in and out of the work stream. Participation on the study group was voluntary—participants contributed to the study group in addition to their regular job responsibilities.

The study group also reflected a significant academic element. The president of the CQM, who facilitated many of the early study group meetings, was a PhD with an empirical research background. A graduate student from a local university (this researcher) was also a team member. Academic influence helped maintain a theoretical and formal research context that supported the action research style.

The engine of the project management structure was the study group meeting. During these meetings, the team conducted activities similar to other project teams. Meetings involved
construction of the survey instrument, discussing findings from fieldwork, and setting future research agendas. The study group met approximately every other week, although members frequently took on assignments to be accomplished outside the meetings.

Development of the CQM model took more than one year. During this period, the study group met 25 times. Table 3.1 documents the key milestones in the model development process.

Table 3.1 Milestones in CQM Model Development Process

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition of need to develop change model</td>
<td>11/98</td>
</tr>
<tr>
<td>Gather samples of change models used by members</td>
<td>12/98</td>
</tr>
<tr>
<td>Identification of common elements from various change models</td>
<td></td>
</tr>
<tr>
<td>Definition of 9 essential change elements</td>
<td></td>
</tr>
<tr>
<td>Questions for diagnosing the 9 change elements</td>
<td>1/99</td>
</tr>
<tr>
<td>Inducing higher level questions and categories from diagnostic questions</td>
<td></td>
</tr>
<tr>
<td>Check for omissions and errors to groupings using deductive reasoning</td>
<td>2/99</td>
</tr>
<tr>
<td>Merging 9 change elements and questions into CQM “7 infrastructure” categories</td>
<td>3/99</td>
</tr>
<tr>
<td>Decision to develop survey for managers based on model developed</td>
<td></td>
</tr>
<tr>
<td>Decision for “behaviorally anchored” Likert scale to reduce measurement error</td>
<td></td>
</tr>
<tr>
<td>Modifying question wording and developing anchors for each survey item</td>
<td>4/99</td>
</tr>
<tr>
<td>Group review of questions and anchors one question at a time</td>
<td></td>
</tr>
<tr>
<td>Version 1 of survey completed</td>
<td></td>
</tr>
<tr>
<td>Version 2 containing cover and demographics page for alpha test completed</td>
<td></td>
</tr>
<tr>
<td>Alpha test using 2-4 volunteers at multiple sites to obtain feedback on content, style</td>
<td></td>
</tr>
<tr>
<td>Group revision of survey using alpha feedback-version 2.1</td>
<td></td>
</tr>
<tr>
<td>Development of “preamble page” requiring change initiative definition</td>
<td></td>
</tr>
<tr>
<td>Single person rewrites entire survey for uniform presentation-version 3.0</td>
<td>5/99</td>
</tr>
<tr>
<td>Group review and changes to single person re-write-version 3.1</td>
<td></td>
</tr>
<tr>
<td>Second round of alpha testing using site manager volunteers</td>
<td></td>
</tr>
<tr>
<td>Group reordering and rewording of questions based on alpha feedback-version 3.2</td>
<td>6/99</td>
</tr>
<tr>
<td>Further group rewording of two categories-version 3.3</td>
<td></td>
</tr>
<tr>
<td>Beta test at 4 sites: management teams and others complete survey and critique</td>
<td></td>
</tr>
<tr>
<td>Statistical analysis to understand validity of measurement model</td>
<td>7/99</td>
</tr>
<tr>
<td>Categorization of qualitative feedback on survey style</td>
<td></td>
</tr>
<tr>
<td>Presentation of preliminary findings to CEOs of local CQM-member organizations</td>
<td>8/99</td>
</tr>
<tr>
<td>Revisions to categories suggested unreliable by statistical analysis</td>
<td>9/99</td>
</tr>
<tr>
<td>Development of results construct to test validity of measurement model</td>
<td></td>
</tr>
<tr>
<td>Review of survey by 2 new participants</td>
<td>10/99</td>
</tr>
<tr>
<td>Group review of survey question-by-question to improve content, simplify wording</td>
<td></td>
</tr>
<tr>
<td>Version 4 of survey complete</td>
<td>11/99</td>
</tr>
<tr>
<td>Revisions to select questions based feedback from the field-version 4.1</td>
<td>1/00</td>
</tr>
<tr>
<td>Development of training manual based on the CQM model</td>
<td>2/00</td>
</tr>
</tbody>
</table>

The progression in Table 3.1 suggests a research process of some rigor. Noteworthy features of the process included the use of an inductive, “ground-up” process used to generate conceptual categories and items used to reflect them, long periods of group-based survey item
development and editing, and repeated cycles of field testing and revision of the measurement model.

To better understand the degree of rigor associated with the model development process, we extract some of the line items from Table 3.1 and elaborate them. Sources of data include study group meeting minutes and notes taken by this researcher.

1) Review of change models in use (November-December, 1998)

An early research question posed by the study group was, “What is the process for implementing change in an organization?” All study group members were asked to present the frameworks of change used by their organizations. Six different change models were presented. Some of these models were internally derived; others were brought in by outside consultants, such as Kotter’s (1995, 1996) model.

2) Identification of elements common change process elements (December, 1998-January 1999)

After the models were presented, the study group conducted a brainstorming session to identify the elements that appeared common to most change models as well as those elements that appeared in only a few models but were noteworthy nonetheless. Findings from this brainstorm appear in Table 3.2.

3) Selection of critical success factors for successful change (January, 1999)

After the elements in Table 3.2 were identified, each study group member was asked to group and structure the elements into individual frameworks of change process. The question posed was: What are the essential elements of an effective change process?

Members utilized a version of the KJ method to organize their frameworks. The KJ method, named after anthropologist Jiro Kawakita (1977, 1991), is an inductive method for grouping, labeling, and relating qualitative data. The key output of this approach is an affinity diagram or a tree diagram—visual displays of categorized ideas or facts that are commonly promoted as quality management tools (see, for example, Evans and Lindsay 1999: 190-191).
Table 3.2: Elements Observed in Various Organizational Change Models

<table>
<thead>
<tr>
<th>Common Elements</th>
<th>Unique, but Noteworthy Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compelling need for change</td>
<td>Assessment of people’s readiness to change</td>
</tr>
<tr>
<td>Assessment of as-is condition</td>
<td>Reallocation of decision rights (articulation)</td>
</tr>
<tr>
<td>Education</td>
<td>Change to change process or content based on experience</td>
</tr>
<tr>
<td></td>
<td>Refreezing or anchoring new behavior</td>
</tr>
<tr>
<td>Need for change</td>
<td>Visible demonstration of new behavior</td>
</tr>
<tr>
<td>New skills</td>
<td>Organizational (context)</td>
</tr>
<tr>
<td>Desired future state</td>
<td>Union</td>
</tr>
<tr>
<td>Use of data</td>
<td>History</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Regulations</td>
</tr>
<tr>
<td>Connection to mission/vision/core value</td>
<td>Cultural</td>
</tr>
<tr>
<td>Alignment with other systems</td>
<td></td>
</tr>
<tr>
<td>Performance measurement</td>
<td></td>
</tr>
<tr>
<td>Performance reward</td>
<td></td>
</tr>
<tr>
<td>Leadership support and sponsorship (walk the talk)</td>
<td></td>
</tr>
<tr>
<td>Key stakeholders</td>
<td></td>
</tr>
<tr>
<td>Diffusion of success stories/communication</td>
<td></td>
</tr>
<tr>
<td>Implementation plan</td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td></td>
</tr>
<tr>
<td>Knowledgeable facilitators</td>
<td></td>
</tr>
<tr>
<td>Support systems - Places, IT</td>
<td></td>
</tr>
<tr>
<td>Structured change process</td>
<td></td>
</tr>
<tr>
<td>Prioritize initial efforts for success</td>
<td></td>
</tr>
</tbody>
</table>

Each study group member shared his/her conceptual framework with the group. Based on these presentations, the group decided to move up the ladder of abstraction and list those elements felt most critical for accomplishing successful change. The group agreed that the framework did not require perfection. Rather, it was understood that the model would be refined through additional iterations. The list of critical change process elements appears in Table 3.3.

Table 3.3: Critical Elements for Accomplishing Successful Change

| Compelling Need Establishment                             |
| Current State Assessment                                   |
| Gap Analysis (Future – Current) Thoroughness               |
| New Standards Establishment                                |
| Appropriate Infrastructure Creation                        |
| Monitoring System Effectiveness                             |
| Communication Comprehensiveness                            |
| Education Delivery                                         |
| Implementation Plan Execution                              |
4) Generation of diagnostic questions for each element (January, 1999)

Subgroups of study group members were asked to generate five to 7 questions that should be asked to diagnose each of the 9 critical change process elements appearing in Table 3.3. (Recall that a primary objective of the study group was to develop a diagnostic tool for CQM member organizations—see section 3.2.3.1). Some representative examples of the diagnostic questions appear in Table 3.4. Approximately 250 diagnostic questions were generated using this approach.

Table 3.4: Representative Diagnostic Questions Generated by Subgroup Teams

<table>
<thead>
<tr>
<th>Compelling Need Establishment</th>
<th>Education Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Have we determined how critical the proposed change is to achieving future success?</td>
<td>1) Have we ensured that all education requirements are in place?</td>
</tr>
<tr>
<td>2) Have we assessed the change in terms of cost versus benefit?</td>
<td>2) Have we identified the target audience for each training or education class?</td>
</tr>
<tr>
<td>3) Have we considered how urgent the need for change is in the eyes of our stakeholders?</td>
<td>3) Are trainers identified and in place?</td>
</tr>
<tr>
<td>4) Have we relied on relevant data to identify the need for change (performance data, market data and trends, competitive information, customer feedback, employee feedback, etc.)?</td>
<td>4) Have the trainers been adequately prepared?</td>
</tr>
<tr>
<td>5) Have we identified how not making the change would impact the organization (risk analysis)?</td>
<td>5) Has the physical location of the training been identified and verified as adequate?</td>
</tr>
</tbody>
</table>

5) Grouping the questions and developing categorical labels (January-March, 1999)

After the deductive exercise of generating diagnostic questions from an abstract “critical change process element,” the group then moved in an inductive direction to organize the 250 diagnostic questions into groups and developing diagnostic labels for the groupings. The method employed was the KJ technique described above. The tree diagram underwent multiple iterations as members reviewed their work for its completeness. This review process required 4 team meetings and over one month to complete. The output was a large tree diagram with the overall title: “How to diagnose change activities in our organization.”
6) Translating the 9 essential change elements into the Seven Infrastructures (March 1999)

Prior to the formation of the study group, the CQM had adopted the “Seven Infrastructures” model of Shiba et al. (1993) in its training course offerings to member organizations. After an investigation by the group’s facilitator (also the president of the CQM) suggested that the 9 essential elements and the associated diagnostic content could be categorized under one of the seven categories of the Shiba et al. (1993) model, the group decided to translate the content of their work into the Seven Infrastructure context. This was deemed appropriate in order to exploit the equity built from orienting member organizations in the Seven Infrastructure context. Perhaps more importantly, the substantive diagnostic content comfortably fit under the new headings. The view of the group is captured in the following comment from one team member: “Frankly, it makes no difference to me what we call each of these categories since the content or details would still be the same under either group of headings.” The revised labels that reflected the Seven Infrastructure model categories appear in Table 3.5.

Table 3.5: Revised CQM Model Categories to Reflect the Seven Infrastructures Model

| 1. Objective setting |
| 2. Goal setting |
| 3. Training and education |
| 4. Promotion |
| 5. Sharing of success stories |
| 6. Incentives and rewards |
| 7. Diagnosis and monitoring |

7) Developing survey questions (March-June, 1999)

At this point, the study group had met approximately 10 times and was nearing its fifth month of existence. The group now directed its efforts towards developing a diagnostic survey instrument from the data obtained thus far. In particular, the task was to derive survey questions based on the low-level diagnostic questions in the final tree diagram. Rather than conventional Likert-type scales for the questions, it was felt that assigning behavioral anchors to the 1 through 5 choices would reduce the measurement error frequently encountered in survey response (see
section 3.3 for detail on the behavioral anchor design). The design choice of behavioral anchors required a substantial commitment. Consider, for example, the following question with behavioral anchors:

Were new roles and responsibilities established for employees as a way to “cement” the change?
- 0. Don’t know
- 1. There was no discussion of new roles or responsibilities.
- 2. Expected changes in roles and responsibilities were defined for some people.
- 3. The expected changes were defined for most people.
- 4. Most people understood the new roles and responsibilities.
- 5. New roles and responsibilities were established and resulted in behaviors that were consistent with the new roles.

In addition to writing the question, five narrative responses were required to articulate the behavior appropriate to a score of one through 5. The consequences of this approach became apparent. Drafting these questions required considerable time. Over the course of two months, the study group conducted at least six meetings dedicated to an iterative process of development, review, and revision of the survey questions and their anchors. Drafting the behavioral anchors proved to be challenging, since the anchors forced the group members to articulate how their theory was expressed in actual organizational behavior on a progressive scale. In effect, the process appeared to help the study group elaborate their theory in more detail.

8) Alpha testing feedback (May, 1999)

Over the course of approximately 10 meetings and three months, the group practiced this review and revision process to develop a 29-item questionnaire. As part of the process, draft versions of the survey were given to 8 managers at three CQM member organizations to obtain feedback on both content and presentation style. One complaint was that the survey took too long to complete (one volunteer required more than three hours to complete the survey). Part of the time requirement related to the behavioral anchors, which required significantly more time and attention from respondents in order to understand. Another complaint related to the “wordiness” of the survey. Terms like “too abstract”, “too academic”, “hard to read”, were common among the alpha test group.
9) Beta testing (June-August, 1999)

After incorporating the alpha test feedback into the revision process, the study group produced another draft version of the questionnaire for a larger scale “beta test.” Four CQM sites were selected for the beta test. At each site, the survey was given to both a group of mid- to upper-level managers as well as to a group of lower-level managers or hourly workers. More than 60 surveys were obtained from these sites. The group obtained both quantitative and qualitative feedback from the beta sites. Quantitative data, including descriptive statistics by test site, and statistical analysis of the instrument’s measurement quality, suggested an encouraging degree of construct and predictive validity—although some additional work was necessary on certain survey questions. Qualitative feedback still suggested that the survey was too difficult to read and understand—particularly by lower level personnel. The beta test phase required approximately two months to complete.

10) Final revisions to survey (September-December, 1999)

Based on the beta test feedback, the study group embarked on one final review and revision cycle of the survey. This review cycle was intensive, aimed at both improving the content and its readability as suggested by the beta test feedback. An eighth category, Achievement of Results, was added in order to assess the results obtained from the change’s implementation. The final version of survey contained 35 questions over eight categories. During the final revision cycle, the survey was given to two groups of approximately 20 mid- to upper-level managers as part of routine CQM training sessions and diagnostic activities within CQM member companies. Study group member presided over these “gamma tests” of the survey. A particularly encouraging stream of feedback from these tests was that readability of the survey was significantly improved. Survey completion time usually ranged from 15 to 30 minutes.

11) Developing a theoretical narrative (December, 1999-March, 2000)
A key objective of CQM study groups is to develop methodology that can be incorporated into CQM training programs and diffused among member organizations. The final substantive task of the CQM study group was to develop a training manual that described the model developed by the CQM study group and how it could be utilized to mobilize and diagnose change activities in CQM member organizations. An interesting consequence of this activity was that it forced the study group to develop a narrative that articulated the theory behind the measurement instrument developed by the group. The theoretical narrative effectively was induced from the empirical evidence that the group had gathered over 14 months of investigation.

This approach is nearly the opposite of the conventional academic approach to model development. The traditional scholarly approach requires that a conceptual theoretical narrative precede the development and use of an instrument to operationalize the model. The path taken by the study group—moving from data to theory—is more reflective of the grounded theory approach espoused by some scholars in sociology (e.g., Glaser and Strauss 1967).

### 3.3 Content of CQM Model

As noted in the previous section, the CQM study group did not adhere to academic convention when building its model. The study group used the “gather data first” rule and ignored the massive theoretical review that typically occupies scholars early in the model development process. It was only after the group was satisfied with the field performance of the survey instrument that they began an effort to draft a narrative of the conceptual theory that underpinned the model in use.

Therefore, the CQM model of change implementation is best understood by examining the contents of the resulting measurement instrument—and then inducing the theoretical model that is expressed by the instrument.
It is interesting to note that academics sometimes develop models in a similar fashion—even if they are hesitant to admit it. Burke and Litwin (1992) offered the following information as background to their efforts to establish the validity of their model of organizational change:

In our organizational consulting work, we try very hard to link the practice to sound theory and research. The linkage typically is in the direction of theory and research to practice: that is, to ground our consultation in what is known, what is theoretically and empirically sound. Creation of the model to be presented in this article was not quite in that knowledge-to-practice direction, however... The fundamental framework for the model evolved from theory. The components of the model, and what causes what and in what order, on the other hand, have evolved from our practice. To risk stating what is often not politic to admit in academic circles, we admit that the ultimate development of our causal model evolved from practice, not extensive theory or research. What we are attempting with this article, therefore, is a theoretical and empirical justification of what we clearly believe works. To be candid, we acknowledge that our attempt is not unlike attribution theory—we are explaining our beliefs and actions ex post facto: “This seemed to have worked; I wonder if the literature supports our action.” (p. 524)

Table 3.6 presents the categories and individual items that comprised the survey. A complete version of the survey questionnaire appears in Appendix 1.

Table 3.6: Categories and Items of the CQM Survey Instrument

CQM 7 Infrastructures Diagnostic Survey
Version 4.0

1.0 GOAL SETTING: The degree to which the objective was understood.
1.1 Was fact-based data used to identify the need for change?
1.2 Did organizational leaders evaluate the current condition (financial, competition, labor, etc.) prior to setting goals for the change?
1.3 Was the gap between “where we are” and “where we want to be” determined?
1.4 Was feedback from affected people (customers, employees, shareholders, suppliers, etc.) included in the goal-setting process?
1.5 Was the goal of the change clearly stated?

2.0 ORGANIZATION SETTING: The degree to which the resources and support structures were in place to initiate the change.
2.1 Were the necessary resources (i.e., time, space, funding, etc.) provided to support the change effort?
2.2 Was an action plan developed for making the change?
2.3 Was a timeline for successful completion established?
2.4 Were the organization’s priorities communicated to guide decisions during implementation?
2.5 Did the organization examine and adjust (as needed) standard policies and procedures to support the change effort?

3.0 TRAINING AND EDUCATION: The degree to which the capabilities were in place to accomplish the change.
3.1 Did leaders identify important skills and capabilities needed to make the change?
3.2 Did the organization develop necessary skills and capabilities through training, mentoring, outside acquisition or other means?
3.3 Did the organization make sure that needed skills and capabilities were in place in time to complete the changes?
3.4 Did the training and education provided help people succeed with the change?
4.0 PROMOTION: The degree to which the change objectives and activities were communicated to the organization.
4.1 Was the need for this change widely communicated throughout the company?
4.2 Were managers supportive of the change effort?
4.3 Were employees kept informed about the ongoing status of the change process?

5.0 SHARING OF SUCCESS STORIES: The degree to which positive activities and results were shared with the organization.
5.1 How well were successes of the change effort communicated?
5.2 Were successful change results shared in a timely fashion?
5.3 Were senior managers visibly involved in the process of sharing success stories?
5.4 Were important lessons learned shared across the organization?

6.0 INCENTIVES AND REWARDS: The degree to which behavior consistent with the change was reinforced and recognized.
6.1 Were new roles and responsibilities established for employees as a way to cement the change?
6.2 How was individual performance reviewed?
6.3 Were employees rewarded for working to support the change effort?
6.4 Were organization leaders held accountable for their behavior related to the change?

7.0 DIAGNOSIS AND MONITORING: The degree to which the change process was evaluated and corrections were made.
7.1 Was information about the progress of the change obtained?
7.2 Was information effectively used to enable corrective action when necessary?
7.3 How effective were the actions taken to correct the progress of the change?
7.4 Was the process the organization used to implement the change reviewed for improvement?

8.0 ACHIEVEMENT OF RESULTS: The degree to which desired results were realized from the change.
8.1 Did the change have a positive impact on business results?
8.2 To what extent did the change achieve cost goals?
8.3 Was the change effort on schedule?
8.4 To what extent has the change resulted in expected behaviors?
8.5 Overall, how satisfied were you with the changes?
8.6 Overall, how satisfied were you with how implementation was done?

In this section, we describe the CQM model. Since the CQM model is reflected in the survey instrument itself, we must induce the conceptual model from the content of the survey. In addition to the survey itself, we draw from other data sources as appropriate to add necessary context. These supplemental data sources include notes taken by this researcher during study group meetings, meeting minutes generated by the group, and training documents developed by the team ex post the measurement instrument.

We proceed by elaborating the CQM model from three perspectives. First, we describe some of the general features of the model, including some necessary background context.
Second, we detail the individual categories (or constructs) that comprise the model and the content of each category against the theoretical literature. Third, once we have examined each category in depth, we compare the overall CQM change process model against some prominent models of change appearing in the literature.

3.3.1 General features of the CQM model

In this section we identify several salient features of the overall CQM model. Most of these features stem from the context under which the survey was developed.

First, consider again the original objective of the study group, which was to "develop a step-by-step process for diagnosing the [organizational structure] for managing change" (CQM Mobilization Training Manual Draft Version 4, p. 5). The first important concept here is diagnosis. Early in the process, the study group defined diagnosis as “a determining or analysis of the cause or nature of a problem or situation.” (study group email communication, 12/1/98) The study group, therefore, was focused on developing a framework that would provide guidance on the causes of a problem or on the current state of affairs.

Diagnosis of what? By examining the mission statement noted above, the focus was diagnosing the state of, or problems with, the organization’s structure for managing change. As noted in Chapter 1, executives of CQM member companies considered the effective management of change as a critical issue facing their organizations. The study group was charged with developing methodology in response to this issue. As noted in the survey’s cover letter: “Using this survey will allow us to assess how we are doing at accomplishing desired changes using the [model in the survey] as a point of reference.” (Cover letter, CQM Survey Version 3.3).

Who does the diagnosis? An important characteristic of the methodology developed by the study group was that the model was meant to be hands-on. That is, the diagnostic device was developed for use by organizational members, primarily managers, in a self-assessment mode.
Until recently, organizational assessments have been primarily conducted by an outside consultant for a client organization (see Lawler et al. 1980 for an overview of conventional organizational assessment process). Self-assessment, where the evaluation is managed primarily by organizational insiders, is a fairly recent phenomenon. The quality movement appears to have kindled interest in organizational self-assessment using various quality management models, such as the Baldrige criteria or ISO 9000 quality assurance standards. A commonly observed consequence of self-assessment using quality management frameworks has been insight on strengths and weaknesses of key managerial processes; this insight is frequently converted into process improvement (Ford and Evans 2000).

The study group’s preference for self-assessment may have related to the strong quality management orientation of the CQM and to the experiences of study group members with various quality frameworks such as the Baldrige criteria and ISO 9000. Based on their collective experience, the study group viewed the self-assessment approach as an effective way to improve the organization’s ability to manage change. These views were best expressed during dialogue among study group members about the purpose of the diagnostic tool underdevelopment:

“From my past experience with QS 9000, I see an assessment instrument to facilitate self audits.”
“The diagnostic device that we develop could be used by managers or by an audit team—at minimum.”
“The real value to CQM member companies would be a tool to use to get better.”
“First and foremost, I see this tool as being a self-assessment tool to be used by senior managers.”

The final general dimension of model is its focus on a particular change initiative for diagnosis. To satisfy the group’s mission of diagnosing aspects of change management, the study group settled on a methodology built around the evaluation of a particular change initiative. As articulated in the survey cover letter:

This survey is intended to diagnose the effectiveness of a specific change initiative within your organization through an assessment of each of the [activities described in the survey]. This change may be related to technology, a product, a process, culture, organization, leadership, etc. If the scope of this change impacts multiple "groups", however you define those "groups within your organization that this survey applies.

As you respond to the questions, think of [name of your organization's change initiative] as a specific example of a recent change initiative in our organization. It is important to us that this diagnostic survey provides an accurate "snap-shot" of our current change process. Therefore,
follow the attached instructions and answer candidly based on your experiences and observations. (Cover Letter, CQM Survey Version 3.3).

Although the methodology was focused on a particular change effort, the study group believed that the self-diagnosis could also be applied towards the issue of “how we do change in general.” For example, the survey cover letter stated: “Improving our ability to conduct a diagnosis for mobilizing change will positively impact the likelihood for successful implementation of future change initiatives.” (Cover Letter, CQM Survey Version 3.3)

The actual consequences of using the self-assessment model for managing specific change initiatives versus managing change in general will be discussed in Chapter 4. At this point is important that we understand the CQM model was built using a “reference change” in order to diagnose the organization’s change management process.

To summarize, there are several salient features of the overall CQM model. First, the model is intended to be a diagnostic one—meant to reveal problems or current conditions. Second, the focus of the diagnosis is on the organization’s structure for managing change. Third, the model was built primarily for use by managers in a self-assessment mode. Fourth, the model is built around the diagnosis of a particular change initiative undertaken by the organization. With these general features of the model defined, we can move towards a more detailed understanding of the key constructs of the CQM model.

### 3.3.2 Detailed definition of CQM model elements

As noted above, the CQM model was developed to be a diagnostic one—focused on revealing problems with, or current states of, the organization’s structure for managing change. Necessarily, in order to diagnose problems with the current change management structure, the model must operationalize the high-level construct of “change management structure”. The CQM survey instrument is divided into eight categories: Goal Setting, Organization Setting, Training and Education, Promotion, Sharing of Success Stories, Incentives and Rewards,
Diagnosis and Monitoring, and Achievement of Results. These categories can be considered the primary constructs of change management structure as reflected in the CQM model.

The first seven constructs are named after “the Seven Infrastructures” framework described by Shiba et al. (1993). Developed in the context of total quality management, the Seven Infrastructures are intended to represent “the seven elements of organizational infrastructure for implementing TQM.” (Shiba et al. 1993: 337).

The authors’ conceptualization of the Seven Infrastructures model, including proposed relationships between variables, appears in Figure 3.1. Activities that determine the content and goals of the change begin the change process, followed closely by early changes in organizational structure that will help move the change forward. Skill development and communication that helps promote the change serves to “push” the change through the organization. Feeding back successes helps inspire organizational members and facilitates learning about what behaviors tend to work. To help “pull” the change through the organization, rewards and incentives reflect desired behaviors, and a system is employed to monitor the progress of the change and to take corrective action when necessary. Execution of these activities determines the output or results of the change.

Historically, the Seven Infrastructures framework has been part of the fundamental training that the CQM delivers to its member organizations. The group felt that it was useful to exploit this historical asset in developing and deploying the survey-based model. In effect, the Seven Infrastructures provided a common language upon which the diagnostic model could be built and deployed among CQM member organizations. Indeed, as stated in the cover letter for the survey:

The 7 Infrastructures…gives us a common language with other member companies. The benefit of this is that once we have identified where we need to improve, we will be able to contact and utilize CQM members who are doing better in those areas as resources for mutual learning (Cover Letter, CQM Survey Version 3.3).
Although Shiba et al. (1993) formulated the Seven Infrastructures framework in the context of implementing TQM, the group expanded the scope of the framework to include changes of all types. Prior to the study group’s existence, CQM training courses had already been promoting the Seven Infrastructures in the larger context of change management. Some study group members cited activities of particular CQM member organizations that were successfully applying the Seven Infrastructures model in their change management efforts; it was felt that these organizations served as “existence proofs” of the model’s validity in the change management context. This viewpoint was expressed in the introductory language of the survey:

The survey is organized around the CQM 7 Infrastructures…These infrastructures have been successfully used by many companies to implement changes in order to improve the quality of their organizations. Using this survey will allow us to assess how we are doing at accomplishing desired changes using the 7 infrastructures as a point of reference (Cover Letter, CQM Survey Version 3.3).

Although the study group borrowed the Seven Infrastructure labels from the Shiba et al. (1993) model, the survey questions that reflected the seven categories were developed with little reference to the conceptual narrative appearing in Shiba et al. (1993). Instead, the study group
generated the reflective items empirically, using an inductive language processing technique frequently attributed to Kawakita (1977).

We proceed to describe the first seven categories of the CQM model, those that represent the Seven Infrastructures, individually. For each category, we first elaborate the content of each survey category appearing in Table 3.6. Once defined, the content is compared to the relevant theoretical literature. Our literature comparison in this section is intentionally microscopic. That is, we seek to “drill down” into the model’s constructs to gather a close-up perspective of the content’s relationship to the literature. Of course, this approach provides little insight into the theoretical linkages between these variables. We save this “big picture” comparison of the CQM model for the following section (section 3.4).

### 3.3.2.1 Category 1: Goal Setting *(CHANGE DETERMINATION)*

**1.0 GOAL SETTING: The degree to which the objective was understood.**
1.1 Was fact-based data used to identify the need for change?
1.2 Did organizational leaders evaluate the current condition (financial, competition, labor, etc.) prior to setting goals for the change?
1.3 Was the gap between “where we are” and “where we want to be” determined?
1.4 Was feedback from affected people (customers, employees, shareholders, suppliers, etc.) included in the goal-setting process?
1.5 Was the goal of the change clearly stated?

The Goal Setting category reflects the process for determining the goal or objective to be realized from changing the organization. We label this construct *CHANGE DETERMINATION*. The survey questions for this category’s reflect a process for concluding that a change was necessary and for determining the overall goals or objectives to be realized as a result of the change. The use of data and analysis is an important feature of the process. Sound analysis using data helps to accurately evaluate the organization’s current state. A formal assessment of the “gap” between present and future helps determine the extent of the change needed. Obtaining feedback from those who will be affected by the change (both inside and outside the
organization) helps effectively determine the goals of the change. Items that reflect this construct include:

1. A need for change determined through the use of facts and data.
2. Analyzing the current state from various perspectives before setting goals or specifying the change.
3. An analysis that determines the “gap” between the organization’s current state and the desired state that precludes the determination of the change.
4. Obtaining input or feedback from key affected groups during the change determination process.
5. A clear statement of the goal of the change.

A conceptualization of CHANGE DETERMINATION appears in Figure 3.2.

**Figure 3.2: Conceptualization of CHANGE DETERMINATION**

```
<table>
<thead>
<tr>
<th>Current state</th>
<th>Gap determination</th>
<th>Change determination</th>
<th>Stated change goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder feedback</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desired state</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

**Literature Comparison:**

Setting goals for organizational change is central to the teleological category of change theory (Van de Ven and Poole 1995). Some scholars downplay the notion of planned change in favor of more deterministic theories of change, arguing that Darwinian-like environmental forces play a decisive role in organizational change (e.g., Alchian 1950, Hannan and Freeman 1977, Aldrich 1979). Internally driven organizational change through goal development can be tied to a number of literatures. When the change impacts a large part of the organization, the planned change is often considered strategic (e.g., Nadler and Tushman 1989). Of course, the determination of strategic change has long occupied scholars of strategic planning (Ansoff 1965, Andrews 1971, Hofer and Schendel 1978). A deliberate analysis to determine the organizational
goals and objectives is also consistent with the rational decision making model of organizations (March and Simon 1958, Cyert and March 1963).

The organizational development (OD) and change literature (e.g., Bennis, Benne, and Chin 1962, Leavitt 1965, Beckhard and Harris 1977, Beer 1980, Dyer 1981, Harrison 1989, McLennan 1989) constitutes another repository on planned organizational change. Historically, the scope of change treated by the OD literature has been narrower than the strategic management literature (Lundberg 1989, Woodman 1989). The analytical process to determine the goals of the change is more inwardly focused on how the organization can achieve better alignment, or congruence (Nadler and Tushman 1980), between various components in order to improve organizational functioning. A growing number of OD scholars have been calling for a broadening of the OD perspective of planned in order to address the broader change categories that have been impacting organizations (e.g., Jelinek and Litterer 1988).

The items that reflect CHANGE DETERMINATION imply a number of specific theoretical propositions:

CQM1.1: The requirement for change must be derived from the use of facts and data.

CQM1.2: The need for change is derived from the perceived “gap” between the current state of the organization and a desired future state.

There is a large literature on problem definition (e.g., Weick 1979, Dutton, Fahey, and Narayanan 1983, Bartunek 1984, Millikan and Lant 1991). The particular orientation of these propositions reflects the notion of change determination as a rational, analytical process, similar to the organizational problem definition and decision-making models of March and Simon (1958) and Cyert and March (1963). More recently, fact-based management has emerged as a tenet of quality management frameworks (see, for example, NIST 2000, West et al, 2000). Many quality theorists have promoted the use of data in order to arrive at better decisions (Deming 1986, Juran 1989).
Strategic management scholars have long specified a deliberate analysis of various external and internal dimensions of the firm’s environment (markets, rivals, internal capabilities, etc.) when determining plans for large-scale strategic change (Ansoff 1965, Andrews 1971, Hofer and Schendel 1978, Barney 1997). Eisenhardt (1989) found that even in turbulent, fast-paced environments, managers employ large amounts of data and information when making effective strategic decisions.

Exercises that help managers generate pictures of the present and future states of the organization have been promoted in a number of literature streams. Andrews (1971) suggested that the goals and the objectives of the strategic change itself should be a representation of the organization’s present and future states. Systems theorists have articulated the process of projecting the present onto the future state of the organization in order to develop objectives (Ackoff 1970). Organizational theorists can also be found referencing the notion of developing a present state and future state of the organization when planning organizational change (Beckhard and Harris 1977). The difference between the current state of the organization and the desired future state can be viewed as a performance gap (Tushman and O’Reilly 1997), and therefore a problem to be solved.

Despite the intuitive appeal of rational goal setting, scholars have observed that goals are often set by less-than-totally rational means. Managers exhibit variable rationality (Schoemaker 1990). Their rationality is bounded by cognitive limits in processing information (March and Simon 1958). Managers often act on intuition and value judgments rather than reason (Knight 1921, Simon 1947, Westley and Mintzberg 1989).

Do change determination processes differ depending on the size or scope of the change? Some scholars have hinted that organizational dynamics may differ depending on whether the change was transformational or transactional (Burke and Litwin 1992). Classic strategic planning frameworks prescribe a large degree of attention paid toward assessing environmental factors such as markets and rivals, as well as an assessment of internal resources and capabilities in the
development of strategic change (Ansoff 1965, Andrews 1971, Hofer and Schendel 1978, Porter 1985). Researchers have noted a linkage between the organization’s external environment and the organization’s decision-making processes (Miles and Snow 1978). Borrowing from Eppink et al’s (1977) framework, CHANGE DETERMINATION resembles a planning process with an internal, analytical perspective rather than one that is more entrepreneurial and focused on external opportunity searching.

Nadler and Tushman (1980) suggested that attention to the organization’s history was a critical input variable into the organizational change process. The “history matters” argument encompasses the concept of path dependence. The importance of influence of path dependence has been treated at both the industry (David 1985) and organizational (Weick 1979, Teece 1990) levels. At the organizational level, current choices are constrained and influenced by its previous choices with regards to capabilities to develop, markets entered, internal operating policies; there is growing empirical evidence to support this notion (Milliken and Lant 1991, Teece et al 1994). The inference is that an effective change determination process should consider the notion of previous organizational choices and behavior when determining an effective organizational intervention.

CQM1.3: When determining the change, important groups must be consulted.

There is a growing body of work about the importance of involving stakeholders in organizational change. Lawrence and Lorsch (1967) developed a seminal framework of the organization as an open system that interacts with its environment. Pfeffer and Salancik (1978) provided considerable empirical support for the effect of external forces on organizational activity. It has been thought that surfacing and testing new policies among key constituents is important, particularly for large-scale policy changes (Mason and Mitroff 1981).

CQM1.4: The goal of the change must be specified.

The notion of specifying the goals and objectives of an organizational change resonate in many literatures. For large-scale change, the goals or objectives become part of the
organization’s strategic plan, or intended strategy (Mintzberg and Waters 1985, Barney 1997). Clear specification of change goals and programs precede the organizational activities or routines necessary for execution (March and Simon 1958, Churchman 1968, Nelson and Winter 1982).

Some change contexts may reduce a manager’s ability to articulate change goals or desired organizational states. Nadler and Tushman (1989) suggested that one of the challenges with implementing large-scale complex change was the difficulty in visualizing the actual outcome or future state once the change is achieved. Many management scholars have emphasized the emergent component of change; often the final state of the organization is a product of unforeseen events that are not anticipated or planned (Lindblom 1959, Wrapp 1984, Mintzberg 1973).

3.3.2.2 Category 2: Organization Setting (STRUCTURAL SUPPORT)

2.0 ORGANIZATION SETTING: The degree to which the resources and support structures were in place to initiate the change.
2.1 Were the necessary resources (i.e., time, space, funding, etc.) provided to support the change effort?
2.2 Was an action plan developed for making the change?
2.3 Was a timeline for successful completion established?
2.4 Were the organization’s priorities communicated to guide decisions during implementation?
2.5 Did the organization examine and adjust (as needed) standard policies and procedures to support the change effort?

The Organization Setting category represents an examination of the resources and support structure needed to initiate the change. We label this construct STRUCTURAL SUPPORT. In addition to funding, necessary resources can include time and space to do the work. Plans that translate the change objectives into action are required. A timeline that specifies the successful completion of the change from a time standpoint is necessary. Since all contingencies cannot be planned for in advance, a set of guidelines to guide decision-makers improves implementation progress. Standard policies and procedures should be examined and adjusted as need to support the change effort. Items that reflect this construct relate to:
1. The provision of resources such as time, workspace, and funding.
2. An action plan that elaborates how the change will be accomplished.
3. A timeline that marks successful change completion.
4. Guidelines that will help employees make the right decisions during change implementation.
5. An examination of organizational policies and procedures influenced by the change effort.

Literature Comparison:

In a general sense, structure represents the organizational configuration through which the organization carries out its goals and objectives. The notion of structure can be broadly interpreted; it can be perceived as covering nearly any organizational variable that influences organizational activity. For example, Burke and Litwin (1992) viewed structure as the arrangement of functions and people into specific areas and levels of responsibility, decision-making authority, communication, and relationships to assure effective implementation of the organization’s mission and strategy (Burke and Litwin 1992: 532). Galbraith (1973, 1974) treated structure in terms of organizational configurations necessary to process certain categories of information. It is generally accepted that there is a causal path from the organization’s objectives to its structure (Chandler 1962).

The items that reflect STRUCTURAL SUPPORT imply a number of specific theoretical propositions:

CQM2.1: Adequate resources must be provided in order to implement the change.

At its basic level, this proposition addresses resource allocation (see Bower 1970 for an empirical example). The financial aspects of resource allocation, particularly budgeting procedures for allocating capital to large-scale projects, have been widely treated by finance scholars (e.g., Weston and Brigham 1977). Scholars have noted a number of deficiencies with traditional capital allocation procedures, such as the inability to accurately forecast future payoffs (Gold 1976, Hayes, Wheelwright, and Clark 1988), and the difficulty with obtaining additional capital when implementation suggests new opportunities (Myers 1984, Kester 1984).

From a different perspective, industrial economists and strategic management scholars have examined resource acquisition and allocation as it complements organizational strategy. For
example, the resource-based view of the firm (Penrose 1959, Wernerfelt 1984, Deirickx and Cool 1989, Peteraf 1993) considers the firm as a bundle of resources to be developed, combined, and deployed in a manner that results in superior performance. The firm draws from a diverse pool of resource types, including financial, physical, human, organizational, or technology (Hofer and Schendel 1978, Itami 1987, Mahoney and Pandian 1992). Resources that result in valuable, unique, and difficult-to-imitate outputs contribute to superior performance relative to competitors (Barney 1986, 1991). The resource-based view relates more to the context of large-scale, strategic change rather than to narrow, local change.

**CQM2.2: The change objective must be translated into more detailed plans of action.**

**CQM2.3: Successful change requires a predetermined schedule to ensure timely completion.**

The notion of breaking large, abstract goals into smaller, actionable pieces has a distinguished theoretical history. Barnard (1938) argued that an organization’s purpose and objectives should be broken into fragments ordered in time and assignment for cooperation. Simon (1947) portrayed an organization as a hierarchy of decisions with action at lower levels. Ansoff (1965) suggested that strategic objectives were best implemented through a series of cascading goals down through the organization. Action plans act as linking pins between organizational levels on the way to goal achievement (Likert 1961).

Achieving change by breaking abstract objectives into actionable pieces with a time objective also evokes core tenets of project management. The essential role of project management is to deliver a specific result in a particular period of time and at a particular cost (Grundy 1998: 43). Classic project management structure is built around the notion of a project that has a definable scope and duration (e.g., Turner 1993). A number of scholars have observed the potential power of using project management structure to implement large-scale organizational change (Juran 1989, Lord 1993, Pellegrinelli and Bowman 1994, McElroy 1996).

**CQM2.4: Guidelines must be provided to help employees make the right decisions during change implementation.**
CQM2.5: Organizational policies and procedures must be examined to ensure that they are consistent with the change effort.

It is rarely possible, nor perhaps advisable, to plan for all contingencies that may arise from implementing change. Indeed, “realized change” is usually some combination of the initial change that was intended, and opportunities that emerge along the way (Mintzberg and Waters 1985). Although a causal order is often inferred from the change determination to change implementation, the empirical process is rarely linear; constant interplay exists between goal determination and implementation (Lindblom 1959, Cyert and March 1963, Churchman 1968).

Due to the inability to plan for all contingencies in advance, the implementers of a change need decision rules or guidelines to help them make correct decisions along the way (Wood, Bandura, and Bailey 1990). Simons (1995) proposed that organizations could facilitate this through the use of “beliefs systems.” A belief system is an explicitly defined set of organizational definitions communicated by senior managers to provide basic values, purpose, and direction for the organization. Beliefs systems are communicated through documents such as credos, mission statements, and statements of purpose. Over time, beliefs systems contribute to the organization’s dominant logic (Bettis and Prahalad 1995). When problems arise in implementing change, beliefs systems help employees determine what types of problems to address and the solutions to search for.

Beliefs systems function in tandem with “boundary systems” (Simons 1995). Boundary systems define where not to go to search for opportunities. Boundary systems include codes of ethics (such as those for specific professions such as accounting), boundaries specified as part of a specific organizational initiative (see for example, Simons and Weston 1989), or resource allocation systems (such as capital budgeting) that help constrain the free movement of resources inside the organization. In order to be effective, boundary systems must be supported by credible sanctions that punish non-compliance (Coleman 1990).
Organizational policies and procedures should encourage a range of behavior defined by the organizational belief and boundary systems. Human resource policies in particular have been viewed as important to the achievement of large-scale organizational change (e.g., Kerr and Jackofsky 1989, Schuler 1992).

In many ways, belief systems, boundary systems, and policies and procedures can be tied to organizational culture. Some anthropologists and sociologists consider culture as the set of rules and standards that state what people in organizations should and should not do (Schall 1983). By defining the organization’s norms and values, culture becomes a form of “social control” (O’Reilly and Chatham 1996) that actually facilitates innovation and the effective implementation of change. Although some scholars feel that culture can be difficult to manage, to alter, or even to be aware of totally, culture has been found to influence structural choices such as reward systems (Kerr and Slocum 1987) and various management practices (Bernstein and Burke 1989).

One dimension of structure that is not explicitly reflected by the STRUCTURAL SUPPORT items is the classical notion of structure as organizational relationships, reporting responsibilities, divisionalization, and the like. Indeed, Chandler (1962) built his seminal strategy-structure study around the “organization chart” notion of structure. Some theoretical frameworks for organizational design have been proposed (Galbraith 1977, Nadler and Tushman 1988). How the organization is partitioned into divisions and reporting relationships has been found to interact with other structural elements such as management practices (Lawrence and Lorsch 1967) and organizational control (Ouchi 1977).

A particular aspect of organizational structure that is not well expressed in the STRUCTURAL SUPPORT construct is attention to the individual or group that typically leads the change effort. The importance of change agents to change achievement has been widely cited, particularly in the context of large scale, transformational change (e.g., Kanter 1983, Tichy and Devanna 1986, Kanter, Stein, and Jick 1992, Kotter and Heskett 1992, Kotter 1995).
3.3.2.3 Category 3: Training and Education (*SKILL DEVELOPMENT*)

3.0 TRAINING AND EDUCATION: The degree to which the capabilities were in place to accomplish the change.

3.1 Did organization leaders identify important skills and capabilities needed to make the change?
3.2 Did the organization develop necessary skills and capabilities through training, mentoring, outside acquisition or other means?
3.3 Did the organization make sure that needed skills and capabilities were in place in time to complete the changes?
3.4 Did the training and education provided help people succeed with the change?

The Training and Education category represents the systematic development of capabilities needed to accomplish the change. Because capabilities can be developed by means other than training and education (e.g., acquisition of talent outside the organization), we label this construct *SKILL DEVELOPMENT*. The organization’s leaders should identify important skills and capabilities needed to support the change. There are various means to develop skills and capabilities, including training, mentoring, and outside acquisition. One should be able to evaluate whether the organization is indeed developing the appropriate skills and capabilities. Skill development should be timely; skills should be developed neither too early nor too late to support the change. A relationship should be apparent between skill development and individual successes related to the change. The items that reflect this construct include:

1. A leadership-driven identification of the important skills and capabilities needed to make the change.
2. Actual development of the necessary skills through training, mentoring, outside acquisition, other means.
3. Timing of skills development to best support the change’s implementation.
4. An observable link between the skills developed and individual successes related to the change.

A conceptualization of *SKILL DEVELOPMENT* appears in Figure 3.3.

*Literature Comparison:*

At a rudimentary level, *SKILL DEVELOPMENT* relates to the notions of work definition and job-person match. The analytical process can be viewed from the perspective of developing
the individual’s skills with regard to the needs for a specific job (e.g., Campion and Thayer 1987), or from the perspective of the relationship between a person’s talents and the organization’s objectives (e.g., Herbert and Deresky 1987).

**Figure 3.3: Conceptualization of SKILL DEVELOPMENT**

![Diagram](attachment:skill_development_diagram.png)

From a strategic perspective, the development of organizational skills and capabilities can be a significant contributor to competitive advantage (Ulrich 1987). The tacit knowledge, skills, and abilities gained from the performance of organizational activities can be valuable, since such invisible assets are often difficult for outsiders to understand and imitate (Nelson and Winter 1982, Itami 1987). Empirical evidence supports the relationship between practices to acquire and develop skills, and the achievement of organizational goals (e.g., Kerr and Jacofsky 1989, Terpstra and Rozell 1993).

The specific items that reflect *SKILL DEVELOPMENT* suggest some specific propositions:

*CQM3.1: The organization’s leaders should identify important skills and capabilities needed to support the change.*

A needs assessment is commonly proposed as an important early step in the delivery of training programs (Wexley and Latham 1980, Goldstein 1993). A diagnosis of critical organizational tasks and workflows has been viewed as critical to achieving large-scale change (Tushman and O’Reilly 1997). Diagnosis should reveal the tasks that must be accomplished in order to meet the organization’s goals, and the coupling of people to tasks. People must have the proper knowledge, skills, and abilities to execute the critical tasks and work flows required for
change achievement (Vedin 1994). Most classic strategic planning frameworks prescribe the evaluation of internal capabilities as a necessary part of the analysis that goes into strategic planning process (Ansoff 1965, Andrews 1971, Hofer and Schendel 1978).

Empirical research has corroborated the significance of capabilities-related diagnosis. Various case studies have suggested the importance of job-person diagnosis as an antecedent to successful change implementation (e.g., Ackerman 1982, Goodstein and Burke 1994). A larger scale study of 30 firms engaged in downsizing activities in the auto industry found that systematic analysis of jobs, resource usage, and human resource management issues were more likely to attain subsequent improvements in performance (Cameron 1994, Cameron, Freeman, and Mishra 1991).

**CQM3.2:** A process for delivering the required skills and capabilities should include selection of the proper means (training, outside acquisition, etc.), attention to timing, and evaluation.

Processes for delivering skills and capabilities through training have been well defined (e.g., Goldstein 1993, Keith and Payton 1995). Indeed, training has been treated as a desirable means for developing skills and capabilities in a number of change contexts, such as when implementing change in a total quality management environment (Hackman and Wageman 1995). However, the value of skill and capability development via training can depend on the availability of similar skills in the external market (Pettigrew, Sparrow, and Hendy 1988). When suppliers possess superior knowledge, some sort of outsourcing may be desirable (Kogut and Zander 1992). Outside acquisition may be particularly relevant when the organizational skill set required for an activity is increasing or requires extensive specialized skills (Poppo and Zenger 1995).

Efforts to develop skills and capabilities can be too early or too late to support a change. Enough lead-time must be provided so that workers have the ability to assimilate and practice skills prior to their regular use. This can be particularly true for teams that need time to learn and coordinate new skills as a work unit (Cottrill 1997). Training that is delivered far in advance of
the change may also be undesirable if workers forget how to turn their knowledge into practice (Adams 1967), or if workers fail to see the connection between practicing these skills and the organizational change imperative (Baldwin and Magjuka 1997).

There is a large normative literature on the evaluation of skills development, particularly when skills are developed via training (e.g., Arvey and Cole 1989, Goldstein 1993, Kirkpatrick 1996). Empirical studies have frequently found evaluation at both the worker level (has the individual developed the specific technical skills?) and at the group or organizational level (has overall skill development contributed to the achievement of objectives?) (e.g., Reda 1989).

_CQM3.3: A relationship should be apparent between skill development and individual successes related to the change._

The literature demonstrates a clear relationship between job-skills match and performance (see Burke and Pearlman 1988 for a summary). However, scholars have suggested a number of intervening variables in the skills-performance relationship. For instance, it has been shown that motivation moderates the relationships between skills development and performance (Hunter and Schmidt 1982). The design, or re-design of work, can affect motivation (Guzzo, Sette, and Katzell 1985). Therefore, it is important to assess the drivers of individual motivation (Chatman and Barsade 1995).

More generally, a “transfer” construct moderates the relationship between skill development and performance, particularly when skills are developed via training (e.g., Baldwin and Ford 1988, Ford and Weissbein 1997). In particular, transfer “climate”, which includes organizational dimensions such as managerial practices and individual dimensions such as stress levels, has been found to moderate the relationship between training and performance (Rouiller, J.Z. and Goldstein, I.L. 1993, Holton et al. 1997, Bennett, Lehmond, and Frost 1999). A positive transfer climate facilitates the use of skills gained through training on the job.

**SKILL DEVELOPMENT** does not express intervening variables such as motivation or transfer climate. However, the domains of other constructs, such as **STRUCTURAL SUPPORT**,
appear to capture some of the dimensions that moderate the relationship between skill development and performance.

3.3.2.4 Category 4: Promotion (PROMOTION)

4.0 PROMOTION: The degree to which the change objectives and activities were communicated to the organization.
4.1 Was the need for this change widely communicated throughout the company?
4.2 Were managers supportive of the change effort?
4.3 Were employees kept informed about the ongoing status of the change process?

The PROMOTION construct represents the activities for communicating the rationale and content of the change. Promotional activities help “push” the change forward. The need for the change initiative should be broadcast throughout the organization. Managers should be supportive of the change through their behavior and examples. The ongoing status of the change’s implementation should be regularly communicated to employees. The items that reflect this construct include:

1. A broad communication of the need for the particular change.
2. Involvement of managers—their behavior as consistent with the change effort.
3. Regular communication to employees about the ongoing status of the change.

Literature Comparison:

Scholars have recognized communication as a structural variable of organization design that effects organizational performance (e.g., Minter 1974, Poole 1978). Through communication, meaning is translated into organized action—even if some difference in interpretation exists among organizational members (Donnellon, Gray, and Bougon 1986). Indeed, empirical research suggests a linkage between aspects of communication routines and the achievement of change (Johannessen and Olaisen 1993, Richardson and Denton 1996).

The items that reflect PROMOTION suggest some specific theoretical propositions:

CQM4.1: The need for the change initiative should be broadcast throughout the organization.

Presenting a compelling need for change to organizational members is an early step in unfreezing the organization from its current state (Kotter 1995). In order to be palatable to the
organization, the need for change should be consistent with the organization’s perceived sense of purpose. This sense of mission or purpose, then, becomes an important ingredient to achieving change (Pearce and David 1987, Collins and Porras 1994). Leaders play an important role in the process, since they shape organizational interpretation processes by articulating statements of mission and purpose (Barnard 1938, Anacona and Nadler 1989, Hurst 1995). When the change is large in scale, communication helps to persuade employees of the change’s importance (Smircich and Stubbart 1985).

\textit{CQM4.2: Managers should be supportive of the change through their behavior and examples.}

The relationship between managerial behavior and organizational perceptions and activities has a long scholarly history. Fleishman (1953), for example, demonstrated the relationship between the boss’s style and the actions of lower level supervisors. The pervasive role of managers in mobilizing the organization is usually connected to the leadership construct. There is a burgeoning conceptual literature on the role of leaders in affecting change (e.g., Burns 1978, Bennis and Nanus 1985, Torbert 1987, Zaleznik 1989). Some empirical evidence verifies the relationship between leadership and organizational performance (Weiner and Mahoney 1981).

An important mechanism through which leaders mobilize organizational change is through their behavior. Westley and Mintzberg (1989) observed that leaders communicate strategy through dramatic styles and performance—as if they were performing on stage. Hambrick and Cannella (1991) suggested that managers resemble salespeople, since they must constantly promote the importance of an initiative to achieve effective implementation.

“Leading by example” is particularly important if the behaviors required by the change are unprecedented and need to be demonstrated. Providing just verbal direction or vision is not sufficient in this situation. Behavioral models allow others to learn through observing. Importance of observational learning was demonstrated during early research on technology transfer (e.g., Ettlie and Rubenstein 1980).
Senior managers in particular are prime candidates for exhibiting model roles and behavior for others to learn. This is the notion of “walking the talk”, or exemplary action (Steyrer 1998), is an important component of social learning theory. Managers that can effectively model new, desirable organizational behaviors can reinforce the effectiveness in leading the change effort (Wood and Bandura 1989).

CQM4.3: The ongoing status of the change’s implementation should be regularly communicated to employees.

Scholars have examined the relationship between feeding back data to the organization and subsequent organizational change. Beginning in the late 1940s, researchers noted positive consequences from feeding back data on various performance dimensions to organizational members (e.g., Mann and Likert 1952, Baumgartel 1959). Subsequent studies concerned the relationship between data and change (Nadler, Mirvis, and Cammann 1977, Dunham and Smith 1979). Some of this research focused on evaluating the effects of data based change efforts (Miles et al 1969, Callahan and Lake 1973, Bowers 1973). Other work has focused on process issues associated with feeding back data to motivate change (Chesler and Flanders 1967, Klein, Kraut, and Wolfson 1971, Alderfer and Ferris 1972).

Nadler (1976) noted that feedback interventions have been generally found related to positive change in the organization. Nadler also suggested that results have generally been more positive when the feedback is regular, and when large numbers of organizational members participate. Nadler, Cammann, and Mirvis (1980) added that the effects of feedback systems are contingent on a number of contextual factors, such as the problem solving orientation of members, task difference among work units, and the organization’s reward system.
3.3.2.5 Category 5: Sharing of Success Stories (*SUCCESS SHARING*)

**5.0 SHARING OF SUCCESS STORIES:** The degree to which positive activities and results were shared with the organization.

5.1 How well were successes of the change effort communicated?
5.2 Were successful change results shared in a timely fashion?
5.3 Were senior managers visibly involved in the process of sharing success stories?
5.4 Were important lessons learned shared across the organization?

The Sharing of Success Stories category embodies broadly disseminating positive events and results associated with the change. We label this construct *SUCCESS SHARING*. Sharing positive results helps “pull” the change through the organization, since such successes encourage organizational members to participate in the effort. Momentum builds to drive the change through the organization. The right media channels should be employed to effectively communicate the change. Successes should be shared in a timely fashion. Visibility of senior managers is crucial to the sharing of success stories. Lessons learned from the change should be diffused throughout the organization. This category includes the following dimensions:

1. Effective communication of successes associated with the change effort.
2. Timely communication of successful results.
3. Visible involvement of managers in sharing successes
4. Key lessons learned from local successes are broadly adopted across the organization.

A sequential relationship between *PROMOTION* and *SUCCESS SHARING* is possible (Figure 3.4). Promotional activities help move the change forward while sharing successes helps build further momentum once the initiative is underway.

**Figure 3.4: Sequence Between PROMOTION and SUCCESS SHARING**
*PROMOTION* and *SUCCESS SHARING* could also be viewed as first order factors of a higher-level *COMMUNICATION* construct, they both address activities for communicating aspects of the change to the organization (Figure 3.5).

**Literature Comparison:**

Considerable theoretical overlap exists between *PROMOTION* from *SUCCESS SHARING*. For example, proposition *CQM4.3* which deals with information sharing could be cut from the review above and pasted below with little theoretical controversy. Indeed, as portrayed in Figure 3.5 above, it is possible to view these two constructs as stemming from a higher order communications factor.

The best theoretical argument for separating *PROMOTION* and *SUCCESS SHARING* into separate constructs may come from considering Lewin’s (1958) three phases (unfreezing → movement → refreezing) of organizational change. *PROMOTION* represents activities to urge and motivate organizational members to change their behavior (unfreezing). *SUCCESS SHARING* provides feedback on progress to organizational members which helps drive more change-related behavior and momentum (movement). Some organizational theorists have indeed tried to compartmentalize organizational activities into this general sequence (e.g., Goodstein and Burke 1989, Kotter 1995).

**Figure 3.5: PROMOTION and SUCCESS SHARING as part of COMMUNICATION**
In addition to those derived under *PROMOTION* above, the items that reflect *SUCCESS SHARING* suggest some additional theoretical propositions:

*CQM5.1 Proper media channels should be employed to effectively communicate the change.*

In most organizations, there are numerous channels through which communication flows. Some scholars have suggested that certain channels should be favored, depending on contextual variables of the organization. For instance, computer-related communication media, such as the Internet, appear a good fit for organizations with weak social ties among workers who are members of disperse, professionally oriented communities (Pickering and King 1995). When communicating issues related to change, the use of multiple communication channels has been suggested in order to ensure delivery of the message to the desired organizational recipients (e.g., Huseman, Alexander, and Driver 1980, Klein 1993)

*CQM5.2: Local lessons learned related to the change should be diffused through the organization.*

The ability to adopt and disseminate new, useful behavior has been regarded as a characteristic of learning organizations (e.g., Senge 1990, Nevis, DeBella, and Gould 1995). On a broader level, there is a large literature on the diffusion of innovation and change inside an industry (e.g., Rosegger 1979, Rush and Bessant 1992, Lowe and Sim 1993, Apperson and Wikstrom 1997) and inside individual organizations (e.g., Keys and Bartunek 1979, Cool, Deirickx, and Szulanski 1997). In the industry context, a construct labeled “absorptive capacity” has been developed to describe the skill of organizations to recognize the value of new external information and to convert it into something valuable internally (Cohen and Levinthal 1990, Lane and Lubatkin 1998).

Inside the organization, Daft (1978, 1982)—using Burns and Stalker’s (1961) distinction between organic and mechanistic organizations—found that organic organizations tended to facilitate the introduction and dissemination of technically-oriented innovations, while mechanistic organizations were more prone to introduce and diffuse administrative innovations.
In addition, the relative freedom of the organic structure made it difficult for administrators to impose administrative innovations on technical personnel. Daft (1982) argued that technical innovation is driven more by external forces while administrative innovation is more in response to internal needs for coordination, structuring, and control.

Others have found support for the association between technical innovativeness and organic structure (Hage and Dewar 1973) and for support of the relationship between administrative innovativeness and mechanistic organizations (Daft 1982, Daft and Becker 1978, Kimberly and Evanisko 1981). There may also be an effect of strategic orientation (entrepreneurial versus efficiency) on the adoption of innovations (Brittain and Freeman 1980, Gaertner, Gaertner, and Akinnusi 1984).

3.3.2.6 Category 6: Incentives and Rewards (BEHAVIOR MANAGEMENT)

6.0 INCENTIVES AND REWARDS: The degree to which behavior consistent with the change was reinforced and recognized.
6.1 Were new roles and responsibilities established for employees as a way to cement the change?
6.2 How was individual performance reviewed?
6.3 Were employees rewarded for working to support the change effort?
6.4 Were organization leaders held accountable for their behavior related to the change?

The Incentives and Rewards category is concerned with mechanisms for ensuring that behavior needed to achieve the change is obtained. Since managing behavior includes issue beyond incentives and rewards, we label this construct BEHAVIOR MANAGEMENT. New roles and responsibilities are established for individuals so that they understand what is expected of them. Employee performance is reviewed in a way that allows determination of whether employees are performing in ways that support the change. Rewards should recognize and reinforce behavior needed to achieve the change. The organization’s leaders are held accountable for their behavior in relation to the change. The following items support this construct:

1. An identification of the new roles and responsibilities needed from employees.
2. A systematic review of how well new behaviors are being adopted.
3. Rewards to reinforce behavior associated with the change.
4. Holding leaders accountable for behaving in ways consistent with the change.

A conceptualization of *BEHAVIOR MANAGEMENT* appears in Figure 3.6.

**Figure 3.6: Conceptualization of BEHAVIOR MANAGEMENT**

![Conceptualization of BEHAVIOR MANAGEMENT](image)

*Literature Comparison:*

Since an organization’s functioning depends on the actions of its members, the organization can change only when member behavior changes (Tannenbaum 1971, Goodman and Dean 1982). Indeed, studies indicate that individual behaviors relate to job performance (Katerberg and Blau 1983) and to organizational performance (Porras and Hoffer 1986). It follows, then, that systems that steer behavior from the organization’s current activity set to the future activity set should be critical to the achievement of change. Such behavior management systems are frequently referred to as reward systems although these systems frequently extend beyond rewards to other constructs such as setting expectations and performance evaluation (e.g., Kerr and Slocum 1987). Organizational theorists often view reward systems as a type of control system that facilitates change management (see, for example Daft and Macintosh 1984, Burke and Litwin 1992, Tushman and O’Reilly 1997).

The items in *BEHAVIOR MANAGEMENT* suggest a number of specific theoretical propositions:

*CQM6.1: New roles and responsibilities must be established so that individuals understand what is expected of them.*

Although changing job characteristics by itself has been found to affect worker motivation and behavior (Hackman, Pearce, and Wolfe 1978), the perceived difficulty of
articulating goals and expectations is also influential (London and Oldham 1976). Indeed, setting expectations is an important construct in many behavioral theories such as motivation theory (Woodman 1989). Motivation can be viewed as an aroused behavioral tendency to move toward a goal, to take needed action, and to persist until satisfaction is attained (Burke and Litwin 1992: 533). Articulating challenging and compelling expectations can motivate change and improvement efforts (Eden 1986).

However, stating expectations and assigning goals does not guarantee that individuals will accept them. Expectations must be set so there is no broad mismatch between expectations and outcomes. If benefits are not perceived, ongoing efforts to achieve the change can be seen as impossible and motivation decreases (Shalley and Oldham 1985, Woodman and Tolchinsky 1985). Organizational factors may temper the effects of expectations. Oldham (1975) found that individuals internalized goals to different degrees; degree of internalization acceptance was influenced in large part by characteristics of the supervisor by the perceived meaning of the task.

CQM6.2: Employee performance is reviewed in a way that allows determination of whether employees are performing in ways that support the change.

CQM6.3: Rewards should recognize and reinforce behavior needed to achieve the change.

Employee evaluation and reward processes, while sometimes viewed as necessarily separate activities (e.g., Prince and Lawler 1986), are inextricably linked. The reason is that organizations usually get what is measured and rewarded (O’Reilly and Weitz 1980, Kerr 1995).

Studies of performance appraisal done in the early 1960s by General Electric Co. had a significant influence on the conceptual and empirical development of employee review (Lawler, Mohrman, and Resnick 1984). The classic model of performance appraisal is an evaluation of the subordinate done by the supervisor. Organizational attributes that tend to support the top-down approach include a trusting environment, well-defined job descriptions, and a work planning and review process (Lawler, Mohrman, and Resnick 1984). These attributes fit the mechanistic, hierarchical organizational model (Burns and Stalker 1961).
However, evidence suggests that market-based organic organizations often rely less on the top-down performance review system and more on a peer or even bottom-up evaluation (e.g., Kerr and Slocum 1987, Mohrman, Resnick-West, and Lawler 1989). The move towards more group-based appraisals is thought to reduce the conflict and dysfunctional behaviors that sometimes stem from the traditional supervisor-subordinate approach (Lawler 1994).

Methods to distribute incentives and rewards, such as pay and promotion policies, have been found to influence people’s view of work and the workplace (Schneider and Snyder 1975). Incentive system design, such as whether pay is based on a fixed rate or on a piece rate, affects performance (London and Oldham 1976). In order to be effective, a reward system must be perceived as actually linked to performance rather than as randomly doling out rewards (Foulkes 1991). Certain reward systems have been found to influence performance. Reward systems where all members gain from the organization’s overall performance (gain sharing), for example, appear to positively influence performance (Bullock and Lawler 1984).

Although there is evidence that employee evaluation and reward systems affect motivation and performance (Cummings and Schwab 1973, Cummings 1982), there is a dearth of research that examines how individual performance is evaluated and rewarded in the context of change management. Although most theorist in organizational change prescribe adjusting the reward system during a change effort (e.g., Tichy 1983, Kotter 1995, Tushman and O’Reilly 1997), relatively little is known about evaluating and rewarding favorable behavior of organizational members during the transition state of change.

_CQM6.4: The organization’s leaders are held accountable for their behavior in relation to the change._

Individuals are said to be accountable when their performance is monitored and when there are consequences (tangible or intangible) associated with the evaluation (Siegel-Jacobs and Yates 1996). Certain control structure is thought to heighten accountability among executives (Sinclair 1995). Degree of accountability appears to affect decision-making and judgment. In
particular, high levels of accountability appear to encourage more information gathering and examination and to lessen the possibilities of opportunistic behavior (Fandt and Ferris 1990, Hattrup and Ford 1995).

Holding executives accountable for their behavior should be important when the organizational change to be implemented requires managers to model and demonstrate new behavior to organizational members (Wood and Bandura 1989). Large-scale transformational changes usually focus more on behavior than on value and beliefs (Beer, Eisenstat, and Spector 1990).

3.3.2.7 Category 7: Diagnosis and Monitoring (CONTROL)

7.0 DIAGNOSIS AND MONITORING: The degree to which the change process was evaluated and corrections were made.
7.1 Was information about the progress of the change obtained?
7.2 Was information effectively used to enable corrective action when necessary?
7.3 How effective were the actions taken to correct the progress of the change?
7.4 Was the process the organization used to implement the change reviewed for improvement?

The Diagnosis and Monitoring category represents the process for ensuring that the change is achieved. We label this construct CONTROL. Effective control requires obtaining information about the change at regular intervals. When the information suggests that the change is off track, corrective action should be taken. This corrective action should be effective—corrections should positively effect the change’s implementation. At some point, the change process itself should be evaluated for possible ways to improve the implementation of future change initiatives. The items that reflect this construct include:

1. Obtaining information about the progress of the change on a regular basis.
2. Corrective action to the change process based on the information.
3. Effective results stemming from the corrective actions.
4. A review of the change process itself for opportunities for improvement.

A conceptualization of CONTROL appears in Figure 3.7.
Literature Comparison:

Organizational scholars have commonly prescribed monitoring and control of implementation efforts in order to achieve successful change (e.g., Kilmann and Herden 1976, Kotter and Schlesinger 1979, Hunsucker and Loos 1989, Nadler and Tushman 1989, Tushman and O’Reilly 1997). However, the theoretical concept of control has not been well developed in the mainstream organizational change literature. Rather, this concept is more thoroughly addressed in research stream dedicated to managerial control itself, particularly by scholars who have studied diagnostic managerial control systems.

The basic function of a diagnostic managerial control system is to allow managers to keep things on track (Merchant: 1). Control helps bring about conformance to organizational requirements and achievement of purpose (Tannenbaum 1968). A diagnostic control system provides managers with a framework for identifying pertinent control variables, developing suitable short term plans, measuring the level of fulfillment of the plans against the set of control variables, and diagnosing the deviations (Lorange and Scott Morton 1974).

In the context of strategic management or large-scale program management, theorists claim that a diagnostic control system provides essential structure for implementing decided-upon programs (Anthony 1965, Lorange and Scott Morton 1974, Daft and Macintosh 1984, Merchant 1985). Control targets and variables, extracted from program plans, are used to monitor the organization’s compliance with achieving the program.
For diagnostic control systems to control any process, it must be possible to (1) develop preset standards or goals for the process’s output, (2) measure the output, (3) correct deviations between the output measure and the standard (Lawler and Rhode 1976, Otley and Berry 1980, Merchant 1985). By “closing the loop,” feedback and control processes contribute to an effective integrative management system (Forrester 1958, Churchman 1968).

An organization’s tendency to adopt control structure appears related to the organization’s preference for hierarchical structure and, perhaps, to the organization’s size. Governance structure increases with hierarchical structure (Williamson 1991). The prevalence of control problems in small, organic organizations has been widely observed (Lawrence and Lorsch 1967, Greiner 1972, Galbraith 1974, Chandler 1977). The specific items of CONTROL suggest a number of specific propositions:

CQM7.1: Effective control requires obtaining information about the change at regular intervals.

Managers need relevant information for effective control (Ackoff 1970, 1974; Lawler and Rhode 1976). Considerable attention has been directed towards determining critical organizational variables and measuring outcomes. Much of the diagnostic managerial control literature has been grounded in financially based outcome measures. Sometimes called financial accountability control (Merchant 1985), this type of system holds managers accountable for results defined in monetary terms—such as sales, profits, return on assets, etc. A classic example of this approach can be seen in Brown’s (1977) desegregation of return on investment into a number of financial indicators.

However, the concept of critical performance variables has broadened to include non-financial variables such as market share, customer satisfaction, product quality, and service. In addition to budget controls, Daft and Macintosh (1984) studied the managerial control effects of policies, procedures, and the performance appraisal system. Lorange and Scott Morton (1974) concluded that measures relating to such factors as quality were crucial to the effectiveness of a
diagnostic managerial control system. This was due to the strategic importance of these non-financial variables, and due to the fact that these operational variables provided diagnostic guidance on the available levers that managers could pull to correct the process.

Kaplan and Norton (1992) captured the interplay between financial and non-financial diagnostic control measures through their “balanced scorecard” concept. They grouped control system measures into four categories: financial, internal business, customer, and innovation and learning. By measuring and controlling variables in each of these four areas, managers could maintain a broader, more systematic perspective deemed necessary when managing strategic change. Too many measures, however, are thought to confuse and distract managers from effective control (Likert 1961).

Some theorists have claimed that the effectiveness of diagnostic control systems is limited to situations where outputs can be measured in quantitative terms (Simons 1995). However, some studies suggest that information for control need not be quantitative. Liker, Roitman, and Roskies (1987) found that managers utilized employee interviews to obtain feedback on the implementation status of operational and culture changes in their organization. Indeed, much of the routine daily activity of managers, such as hallway talk and phone calls to customers, can be viewed as processes for obtaining systematic feedback on the status of organizational initiatives (Mintzberg 1973, Kotter 1982).

CQM7.2: When the information suggests that the change is off track, corrective action should be taken.

CQM7.3: Corrective action should be effective—corrections should positively effect the change’s implementation.

Management controls require an action or at least weak action outcome (Hurst 1979) in order to be effective. Feedback obtained from relevant information sources should allow managers to estimate the level of goal congruence (Anthony 1965)—i.e., Is the change on track
and meeting our objectives? When a significant difference between the actual situation and the target is perceived, then action is required (Lawler and Rhode 1976).

One condition, then, for corrective action, is that a goal or standard has been established for comparative purposes. Clear control system goals enhance performance (Kenis 1979). There is a large literature on setting goals for diagnostic control, relating to such dimensions as goal specificity (Meyer, Kay, and French 1965), goal difficulty (Hofstede 1968, Hopwood 1974), and goal fairness (Brownell and McInnes 1986).

A second condition for corrective action is the organization’s ability to correct deviations. Diagnostic control is appropriate only when organizational participants can significantly influence the process (Simons 1995). This process influence appears to contain a number of dimensions. One dimension relates to an individual’s position and authority. Certain organizational positions, for example, carry the decision rights necessary to affect process change (Fama and Jensen 1983).

Another important, although less treated notion in the literature is the ability to connect the perceived deviation to the proper organizational variable that requires adjustment. For example, a deviation in unit sales or profitability may not provide clear guidance on “where to go” in order to correct the deviation. If the diagnostic direction is not suggested by the measurement itself, then managers require some type of diagnostic framework that guides them toward the correct organizational levers to pull in order to keep the change on track. Frameworks that provide diagnostic guidance on the relationship between organizational variables relate to performance can be found in the organizational change and assessment literatures (e.g., Lawler, et al. 1980). This suggests an interesting theoretical intersection between managerial control and frameworks for organizational assessment.

CQM7.4: At some point, the change process itself should be evaluated for possible ways to improve the process for future change initiatives.
A fundamental concept in the organizational learning literature is the distinction between single and double loop levels of learning (Argyris and Schon 1978). Single loop learning is the most common level of learning, and encompasses the organization’s ability to perceive deviations from performance and “fix” them. Single loop learning occurs, for example, when managers detect that problems in implementing a specific change initiative and then take action to correct the deviation. Most diagnostic management control systems (Anthony 1965, Lorange and Scott Morton 1974, Otley and Berry 1980, Merchant 1985, Simons 1995) exhibit single loop learning characteristics.

Double loop learning is more sophisticated, since the organization must review the underlying assumptions that created the problem to be “fixed” in the first place, and adapt a better set of assumptions to support future performance. Extending our example above, in addition to correcting the immediate deficit from plan, managers might also step back and question their assumptions and policies that led them to believe that the strategic initiative was effective and could be implemented. Such questioning might cause them to revise some key organizational processes, such as goal setting or skill development, so that future change initiatives will be more effectively implemented. Diagnosis of assumptions and processes, and subsequent improvements characterize double loop learning.

3.3.2.8 Category 8: Achievement of Results (CHANGE ACHIEVEMENT)

8.0 ACHIEVEMENT OF RESULTS: The degree to which desired results were realized from the change.
8.1 Did the change have a positive impact on business results?
8.2 To what extent did the change achieve cost goals?
8.3 Was the change effort on schedule?
8.4 To what extent has the change resulted in expected behaviors?
8.5 Overall, how satisfied were you with the changes?
8.6 Overall, how satisfied were you with how implementation was done?

The first seven categories of the CQM model (the “Seven Infrastructures”) can be viewed as constructs of a higher-level CHANGE PROCESS construct. The process constructs represent
groups of behavioral variables that influence the implementation of change. The eighth category of the CQM model, Achievement of Results, measures the outcomes of change implementation. We label the output construct CHANGE ACHIEVEMENT.

The evaluation of change achievement is multidimensional. One dimension relates to overall organizational or financial performance. A change must also be implemented in a timely fashion. A change’s success can also be assessed according to how well the new behaviors associated with the change are being practiced by organizational members. A change can also be evaluated through the perceptions of those who were involved in the change’s implementation.

The items that reflect this construct include:

1. The impact of the change on overall business results.
2. Results specifically tied to cost or financial goals.
3. Whether the change met timeliness goals.
4. How well the change resulted in behavior changes.
5. Individual perceptions of the change results.
6. Individual perceptions on how well the change implementation process were executed.

The seven constructs of CHANGE PROCESS are linked to the achievement of change, since CHANGE ACHIEVEMENT is meant to represent “the degree to which desired results were realized from the change.” (Survey Version 3.3) A simple view of this relationship appears in Figure 3.8.

**Figure 3.8 Relationship between CHANGE PROCESS and CHANGE ACHIEVEMENT**

![Diagram of relationship between CHANGE PROCESS and CHANGE ACHIEVEMENT]

**Literature Comparison:**

A model of change process should be related to change achievement or organizational performance (Nadler 1980a, Burke and Litwin 1992). A common problem associated with change evaluation and monitoring has been difficulties with measuring the output or consequences of organizational effectiveness and change (Cameron 1980, Lewin and Minton
One challenge relates to accurately selecting the correct set of indicators from the dozens of potential measures of organizational effectiveness cited in the literature (see Goodman and Pennings 1977 for a representative survey of available measures). Another issue relates to separating the signal of organizational change from the noise that results when observers who lose their frame of reference as the change proceeds (Zmud and Armenakis 1978).

The items that reflect CHANGE ACHIEVEMENT suggest some specific theoretical propositions:

\begin{itemize}
  \item \textit{CQM8.1:} The success of a change relates to its effect on organizational and financial performance.
  \item \textit{CQM8.2:} The success of a change relates to the timeliness of implementation.
  \item \textit{CQM8.3:} The success of a change relates to the degree to which desirable new behaviors are observed.
  \item \textit{CQM8.4:} The success of a change relates to the perceived effectiveness of the change and the change’s implementation.
\end{itemize}

The output or results of a change initiative is frequently treated as a multidimensional construct. For example, Tushman and O’Reilly (1997) suggested the following questions when evaluating the effectiveness of a change’s implementation:

- Does the organization actually reach the future according to plan?
- Given that the future state is reached, does the organization function as planned?
- Does the change occur without undue costs to the organization?
- Does the process both recognize and minimize the cost of the change to individuals? (p. 209-211)

The output of change and its evaluation is usually treated at both the organizational level and the individual level. Nadler and Tushman’s (1980) congruence model, Tichy’s (1983) change framework, and the Burke-Litwin (1992) model all portray change output as relating to both organizational performance and the effect or influence on the individual.

A construct of change achievement should include attention to the evaluation of individual behavior (Robertson, Roberts, and Porras 1993). Organizational change only comes
through changes in individual behavior (Tannenbaum 1971, Goodman and Dean 1982). The nature of behaviors of individuals can influence organizational performance (Porras and Hoffer 1986).

An example of how this multidimensional construct can be expressed in an empirical evaluation is Miller’s (1997) multiple case study of the implementation of various strategic initiatives. Measures of implementation success were derived from managers’ responses to structured questions, such as:

- How long was implementation expected to take? How long did it actually take? Was there a deadline?
- How far was the decision implemented? (1=not implemented, 5=completely implemented)
- How far was the decision implemented as intended? (1=not at all, 5=wholly)
- How far did implementation succeed in achieving what was intended? (1=completely unsuccessful, 5=completely successful)
- Have there been any unintended consequences of the decision? What were these and why did they occur?
- How far were you generally satisfied with what was done and the way things were done? (1=not at all, 5=wholly) (p. 597-598)

Miller (1997) proposed three dimensions that described the degree of implementation success: completion, achievement, and acceptability. Completion was the degree to which everything intended was done within the expected time period. Achievement was the degree to which what was done performed as intended. Acceptability was the degree to which the method of implementation and outcomes were satisfactory to those involved in, or affected by, the implementation.

### 3.3.2.9 Summary

The relationship between the CQM change model constructs and the literature appears in Table 3.7. The constructs garner support from scholarly work. Indeed, much of the support can be tied to literature streams beyond organization theory. Some of the outside literature streams include strategic planning, organizational learning, technology diffusion, and managerial control. The variety of supporting literature streams is consistent with the scholarly claims that implementing change, particularly large-scale change, is an integrative, multidisciplinary phenomenon (e.g., Hrebeniak and Joyce 1984).
Does the CQM model omit concepts that should be included in order to accurately express the theoretical domain? *STRUCTURAL SUPPORT* does not directly treat the reconfiguration of organizational tasks or reporting relationships that scholars have related to achieving organizational objectives and change (e.g., Chandler 1962). Moreover, *STRUCTURAL SUPPORT* does not express the importance of the coalition that frequently leads the change and is responsible for change achievement (e.g., Kotter 1995). Reference to the role of leadership is not omitted entirely, however. Items related to the senior management’s participation in the change effort can be found in items under *PROMOTION, SUCCESS SHARING, and BEHAVIOR MANAGEMENT*.

Does the content of the CQM model extend or redefine the theoretical domain related to change process? One area that contributes a fresh theoretical perspective is *CONTROL*. Although organizational scholars have prescribed the importance of change monitoring and evaluation, the theoretical development of this notion in the change literature is minimal. By borrowing notions from the literature on managerial control systems, *CONTROL* contributes to an integrative model of change process that highlights the importance of change monitoring, diagnosis, and corrective action in the achievement of change.

**Table 3.7: Summary of the Relationship Between CQM Model Constructs and the Literature**

<table>
<thead>
<tr>
<th>CQM Construct and Propositions</th>
<th>Associated Theoretical Concepts</th>
<th>Representative Work</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHANGE DETERMINATION</strong></td>
<td>Planned change, teleology</td>
<td>Van de Ven &amp; Poole (1995)</td>
</tr>
<tr>
<td></td>
<td>Strategic planning</td>
<td>Ansoff (1965); Andrews (1971)</td>
</tr>
<tr>
<td></td>
<td>Organizational intervention</td>
<td>Leavitt (1965); Beer (1980)</td>
</tr>
<tr>
<td><strong>CQM1.1: The requirement for change must be derived from the use of facts and data.</strong></td>
<td>Problem definition</td>
<td>Weick (1979); Bartunek (1984)</td>
</tr>
<tr>
<td></td>
<td>Organizational decision making</td>
<td>March &amp; Simon (1958)</td>
</tr>
<tr>
<td><strong>CQM1.2: The need for change is derived from the perceived “gap” between the current state of the organization and a desired future state.</strong></td>
<td>Strategy development</td>
<td>Hofer &amp; Schendel (1978)</td>
</tr>
<tr>
<td></td>
<td>Quality management</td>
<td>Deming (1986); Juran (1989)</td>
</tr>
<tr>
<td></td>
<td>Organizational development</td>
<td>Beckhard &amp; Harris (1976)</td>
</tr>
<tr>
<td><strong>CQM1.3: When determining the change, important groups must be consulted.</strong></td>
<td>Organization as open systems</td>
<td>Lawrence &amp; Lorsch (1967); Pfeffer &amp; Salancik (1976)</td>
</tr>
<tr>
<td><strong>CQM1.4: The goal of the change must be specified.</strong></td>
<td>Strategic planning</td>
<td>Andrews (1971)</td>
</tr>
</tbody>
</table>
## Organizational decision-making
Organizational decision-making is the process by which individuals and groups within an organization make choices that influence the direction and success of the organization. It involves the formulation of strategies, the allocation of resources, and the implementation of plans to achieve organizational goals. March & Simon (1958); Cyert & March (1963)

### Structural Support

**CQM2.1: Adequate resources must be provided in order to implement the change.**
- Adequate resources must be provided in order to implement the change.
- Resource & capital allocation
- Resource-based view of the firm
- Change-structure relationship
- Bowers (1970); Myers (1984); Wernerfelt (1984); Barney (1991)

**CQM2.2: The change objective must be translated into more detailed plans of action.**
- Breaking goals into pieces
- Project management
- Simon (1947); Likert (1961)

**CQM2.3: Successful change requires a predetermined schedule to ensure timely completion.**
- Breaking goals into pieces
- Project management
- Simon (1947); Likert (1961)

**CQM2.4: Guidelines must be provided to help employees make the right decisions during change implementation.**
- Unforeseen, emergent nature of change implementation
- Belief & boundary control systems
- Lindblom (1959); Mintzberg & Waters (1985); Simons (1995)

**CQM2.5: Organizational policies and procedures must be examined to ensure that they are consistent with the change effort.**
- Relationships between policies, procedures, and change
- Structure, culture, and change

### Skill Development

**CQM3.1: The organization’s leaders should identify important skills and capabilities needed to support the change.**
- Assessment of required work task and skill required
- Training delivery
- Outside skill acquisition
- Memory and use of training
- Evaluation of training

**CQM3.2: A process for delivering the required skills and capabilities should include selection of the proper means (training, outside acquisition, etc.), attention to timing, and evaluation.**
- Job-skills match and performance
- Motivation and transfer climate effects
- Burke & Pearlman (1988); Hunter & Schmidt (1982); Bennett et al. (1999)

**CQM3.3: A relationship should be apparent between skill development and individual successes related to the change.**
- Job-skills match and performance
- Motivation and transfer climate effects
- Burke & Pearlman (1988)

### Promotion

**P4.1: The need for the change initiative should be broadcast throughout the organization.**
- Articulating the necessary context for change
- Leadership’s role in articulating core values and principles
- Kotter (1995); Collins & Porras (1994); Barnard (1938); Anacona & Nadler (1989); Hurst (1995)

**P4.2: Managers should be supportive of the change through their behavior and examples.**
- Influence of leadership behavior on subordinates
- Radical change and social learning
- Fleishman (1953); Zaleznik (1977); Westley & Mintzberg (1989); Wood & Bandura (1989); Steyrer (1998)
P4.3: The ongoing status of the change’s implementation should be regularly communicated to employees.

SUCCESS SHARING

CQM5.1: Proper media channels should be employed to effectively communicate the change.

CQM5.2: Local lessons learned related to the change should be diffused through the organization.

BEHAVIOR MANAGEMENT

CQM6.1: New roles and responsibilities must be established so that individuals understand what is expected of them.

CQM6.2: Employee performance is reviewed in a way that allows determination of whether employees are performing in ways that support the change.

CQM6.3: Rewards should recognize and reinforce behavior needed to achieve the change.

CQM6.4: The organization’s leaders are held accountable for their behavior in relation to the change.

CONTROL

CQM7.1: Effective control requires obtaining information about the change at regular intervals.

CQM7.2: When the information suggests that the change is off track, corrective action should be taken.

CQM7.3: Corrective action should be effective—corrections should positively effect the change’s implementation.

CQM7.4: At some point, the change process itself should be evaluated for possible ways to improve the process for future change initiatives.

CHANGE ACHIEVEMENT

Relating change process to change achievement

Difficulty of measuring effectiveness & change

Burke & Litwin (1989)

Goodman & Pennings (1977); Zmud & Armenakis (1978)
3.4 Comparison to Other Change Models

In the previous section, we explored each construct of the CQM model in depth. Although this is an effective approach, an effective theory also includes an explanation of how the theory’s variables are related (Whetten 1989). In this section, we elaborate on the relationships between the constructs of the CQM change process model, and compare the model to some of the prominent change models in the literature. Of primary interest is how the constructs and the relationships of the CQM model compare to the literature models. The degree to which the CQM model aligns with these scholarly models provides additional insight into the model’s content validity.

3.4.1 Proposed relationships between CQM model constructs

In the previous section, we examined the individual constructs of the CQM model. The first seven constructs are intended to represent a model of change process. The notion of process in each of the Seven Infrastructure categories is reinforced by the rating scale employed in the Survey (see Appendix 1). Responses to each survey item ranged from 0 to 5. However, rather than employing a traditional Likert scale, where a score of 1 might represent “to a small degree” and a score of 5 might represent “to a large degree,” the CQM survey employs a “behavioral anchored” scale. In the behaviorally anchored scale, each of the five responses was supported by a short narrative describing the behavior or activity intended to represent the response. It has been proposed that behaviorally anchored Likert scales reduce measurement error associated with survey responses (Blazey 1998). The anchors were developed using the following guidelines:
The anchors suggest a progression from little structure to considerable structure. Such a progression resembles the approach→deployment→results framework used for evaluating organizations against the Malcolm Baldrige Criteria for Performance Excellence (see NIST 2000: 44-45).

There are a number of ways to portray how the seven constructs of the change process model fit together. The simplest model is as to view the model as comprised of seven first order factors (Figure 3.9). The arcs between the constructs imply that the factors are correlated.

**Figure 3.9: CHANGE PROCESS Portrayed as Seven First Order Factors**

Another way to view the relationships is to portray the seven first-order constructs as dimensions of a higher order factor (Figure 3.10). The second order factor, CHANGE PROCESS, can be viewed as an exogenous variable that “causes” the seven lower level constructs. Each lower level construct reflects some dimension of CHANGE PROCESS.
A third way to view the relationships is to specify causal order among the seven constructs. One such view is portrayed in Figure 3.11. During the model’s development and testing, it was often proposed that the categories in the model followed a particular path. Indeed, Shiba et al.’s (1993) Seven Infrastructures model suggested a sequence to the variables (see Figure 3.1).

The study group proposed grouping the 7 CHANGE PROCESS constructs into three categories (CQM Training Manual Version 2.1). The “initiating” group (CHANGE DETERMINATION and STRUCTURAL SUPPORT) aims the organization in the proper direction by defining the change objectives and early resources. The “empowering” group (SKILL DEVELOPMENT and PROMOTION) follows with processes that help push the organization...
forward. Finally, the “steering” group (SUCCESS SHARING, BEHAVIOR MANAGEMENT, and CONTROL) keeps the change going—in effect pulling the organization through to change achievement.

In Figures 3.9, 3.10, and 3.11, we did not include the “results” construct of the CQM model, CHANGE ACHIEVEMENT. However, a relationship is hypothesized to exist between the change process variables and the achievement of change. Various configurations of the process-results relationship will be explored in Chapter 4. In Chapter 4, we will test the validity of these various configurations using data from the measurement model expressed by the questionnaire.

3.4.2 Selecting theoretical models for comparison

When examining the literature on change models, a few challenges arise. First, there are many theoretical change models from which to choose. Burke (1995) claimed to have observed at least 500 unique models of organizational development and change being employed in some sort of diagnostic capacity.

Second, it is often difficult to differentiate between models of organizational behavior and models of organizational change. In many circumstances a model of organizational behavior is applied in a change management context. For example, Nadler and Tushman’s (1980) congruence model of organizational behavior has been used in the diagnosis and management of large-scale planned change (Nadler and Tushman 1989, Tushman and O’Reilly 1997). Other prominent organizational models used in the context of change management include Weisbord’s (1976) six-box model, the McKinsey seven-s model (Peters and Waterman 1982), and the Burke-Litwin model (Burke and Litwin 1992).

Third, few change models have been put through rigorous testing of validity (Nadler 1980a). The validity of most change models has been evaluated less formally, usually through consultant-based applications with clients and through comparison to empirical observation (e.g.,
Weisbord 1976, Kotter 1995, Nadler and Tushman 1989). The continued use of these models by researchers and organizations implies “existence proof” of validity.

To narrow the field of prospective literature models, we first seek guidance from a typology of change process theories proposed by Van de Ven and Poole (1995). Van de Ven and Poole argued that most change theories could be grouped into one of four categories. A *life cycle* model depicts organizational change as moving through a prescribed series of stages, such as start up→growth→harvest. A *dialectical* model of development depicts change as a consequence of conflicts that emerge from opposing entities inside the organization. An *evolutionary* model of change consists of the repetitive sequence of variation, selection, and retention events to drive organizational development. A *teleological* model views change as a cycle of goal formulation, implementation, evaluation, and modification of goals based on lessons learned.

The CQM change process model reflects the teleological category of change theory. As noted earlier, the CQM model’s constructs describe processes of determining the objectives of the change, implementing the change, and evaluating the change.

Many change models, particularly those models employed empirically, reflect a teleological perspective. It is rare to find change frameworks utilized by organizations that are not based on the notion of goal development, implementation, and output or results that are subject to evaluation and revision. In a somewhat circular fashion, one could argue that the CQM study group actually drew heavily from scholarly theory when developing its model, since much of the participants’ practical wisdom and experience stemmed from working with one of the many teleological change models to which their organizations had been exposed.


These models are chosen for a few reasons. First, each of these models display some character of the teleological change theory category proposed by Van de Ven and Poole (1995).
Second, these models are widely cited in the literature; many have been featured in formal reviews of organizational change theory (see, for example, Burke 1995, Werr 1995). Finally, these models represent prominent contemporary frameworks that have established a presence in the empirical world. Members of the study group team were familiar with some of these models (suggesting again that the these scholarly frameworks may have provided a covert source of theoretical grounding for the CQM model).

We proceed to describe each of these models and to compare them to the CQM model.

3.4.3 Nadler and Tushman’s congruence model

The Nadler and Tushman (1980) congruence model emphasizes the centrality of the transformation process to organizational functioning, and reflects the notion of interdependence between core elements of the organizational system. The organization is seen as comprised of a number of components or parts that interact with each other. Organizational consistency or balance is achieved when the components fit together well. If the pieces don’t fit together well, then problems arise and the organization becomes dysfunctional.

Although the model was developed to portray organizational functioning in general, it was developed with diagnostic utility in mind. For example, the model has been employed in the context of change management to diagnose lack of fit between organizational pieces that may impede successful change achievement (see for example, Nadler and Tushman 1989, Tushman and O’Reilly 1995).

The basic notion of the transformation process underlies the model. The organization is seen as a process that converts inputs into outputs. The view of the organization as a transformation process is common in the field of operations management (e.g., Meredith 1992). However, this concept also can be observed in some of the classic writings in organizational science (e.g., Stinchcombe 1965).
Organizational inputs can be viewed as factors that represent a set of “givens” that the organization must face. These inputs are classified into four categories: the environment, resources, history, and strategy.

The environment represents all factors outside the boundaries of the organization that exert some influence on organizational activities. The environment places demands on the organization, such as minimum pricing or quality levels of product and services. The environment can also constrain organizational activities. For example, governmental regulations may limit the availability of investment capital from public markets. Finally, the environment opens opportunities to the organization that may be valuable to explore.

Resources are another input to the organization. Resources include those of the tangible variety, such as land, labor, and capital. They may be of the intangible variety, such as perceived brand superiority in the marketplace or a capacity for organizational learning. Resources are the building blocks upon which the organization’s products and services are built. They can be configured in different ways.

A third resource is the organization’s history. An organization is heavily influenced by past events. In short, history matters. Particularly in a diagnostic mode, it is important to understand the organization’s historic context. Past strategic decisions, the various stages of the organization’s past development, and how the culture has evolved are important predecessors to the organization’s current activities.

Finally, an organization is influenced by its chosen strategy. In the context of the congruence model, strategy is interpreted broadly to mean the entire set of decisions that are made about how the organization will configure its resources against the demands of the environment. This set of decisions fundamentally defines “What business are we in?” Evaluating strategy involves assessing the organization’s markets, offerings, customers, rivals, and other elements.
Outputs consist of what the organization produces as well as how it performs and how effective it is. Besides the basic output, products and services, other outputs are considered that can relate to sustained organizational performance, such as how well groups inside the organization function together.

Outputs can be considered at three levels. At the organization level, one can assess how well the organization meets its objectives, how well the organization makes use of its resources, and adaptability—the ability of the organization to reposition itself with respect to environmental change. To better grasp organization-level outputs, it is also useful to consider output at the workgroup and individual levels. At the workgroup level, one can assess the contribution of teamwork to the organization, or the culture that results from the organizational configuration. At the individual, one can evaluate the degree of worker satisfaction or other indicators of individual proficiency and contribution.

The transformation process represents the major components of the organization that convert inputs into outputs. The congruence model specifies four particular organizational components, or “subsystems.”

Work is one component of the model. Work represents the basic activity that the organization is engaged in. Because it is assumed that the primary task of the organization is to perform tasks that are consistent with strategy, work is considered a starting point for organizational analysis. An analysis of an organization’s work should characterize the different tasks required, the specific workflows, and the required task outputs. Diagnosis of the work construct might also entail an analysis of job design and competency requirements, and other variables that characterize work. The assessment of the adequacy of other components of the organization depends in large part on understanding the nature of the work being performed by the organization.

People who perform the work comprise a second component of the model. Primarily, this construct concerns the characteristics of the individual members. These characteristics
include the nature of individual knowledge or skills, the needs, preferences, and expectations of members, and demographic characteristics of the employee set.

Formal organization is a third component of the transformation process. Formal organization consists of structures, processes, methods, and procedures that are explicitly developed to help individuals perform tasks consistent with organizational strategy. Factors such as the grouping together of jobs into units, the way jobs are designed, the work environment, and formal systems for attracting, placing, developing and evaluating human resources define the formal organization. The specifications of formal organization are frequently in writing.

The final component, informal organization, is unplanned arrangements that develop or emerge over time. Usually implicit and unwritten, informal organizational elements significantly influence behavior. Examples of such informal characteristics include patterns of communication among members, behavior of leaders, and tacit relationships among members or work units. Informal organization can help or hinder the organization’s performance.

The central concept of Nadler and Tushman’s model is congruence. Congruence is a measure of consistency of how well pairs of organizational components fit together. For example, the component of work should fit well with the component of people. The individual skills of workers should be sufficient to accomplish the work task.

The primary proposition of the congruence model is that, given a particular organization context (i.e., its input set and desired outputs), there exists a certain combination of organizational work, people, formal organization, and informal organization that will be appropriate to achieve the organization’s goals. It is possible to use this model to diagnose inconsistencies between the organizational pieces that contribute to dysfunction. Once problems are diagnosed, the organization can be redesigned to achieve better congruence.

The congruence model has a number of strengths. The models integrates a number of various perspectives of the firm, such as the process oriented input→transformation→output view (Stinchcombe 1963), the influence of the environment on the organization (Lawrence and Lorsch
1967, Pfeffer and Salancik 1978), the importance of history through path dependence (David 1985, Teece 1990), and the internal view of organizations as a multivariate systems of interrelated components (Leavitt 1965). It also offers diagnostic potential of a wide range of contexts since the preferred organizational design depends on the situation.

However, these strengths trade with some weaknesses. The four organizational subsystems, while offering parsimony, reveal little in the way of specific organizational variables that should be changed. Guidance on what levers to pull to improve is an important characteristic of an effective diagnostic model.

Important to our context is the usefulness of the congruence model in the context of organizational change. The model of congruence is one that proposes how the organization should function in steady state. In the midst of change, congruence can actually impede the organization’s ability to change. For example, the culture that was designed to promote careful control and accountability of the work task might become a liability when the organization must revise its strategy to include a more innovative, team-oriented environment. When unfreezing the organization (Lewin 1958), or managing the transition towards a new, improved state (Beckhard and Harris 1977), the utility of the congruence model to describe or prescribe is reduced.

Nonetheless, the congruence has been employed in a number of situations to help consultants and managers diagnose the organization’s ability to manage change (Nadler and Tushman 1989, Tushman and O’Reilly 1997).

Similarities to CQM Model

Both the CQM model and the congruence model infer a general path from setting goals, implementing them through adjusting some organizational variables, and organizational results. Both of these models reflect Van de Ven and Poole’s (1995) teleological change theory category. The organizational variables in the congruence model are fairly broad, making it easy to interpret relationships between the CQM model constructs and the congruence model variables. For instance, CHANGE DETERMINATION appears related to the strategy input variable of the
congruence model. Much of the content of the STRUCTURAL SUPPORT, SKILL DETERMINATION, COMMUNICATION, BEHAVIOR MANAGEMENT, and CONTROL could arguably be included in the work, people, and formal organization variables of the congruence model’s transformation process construct.

Both models specify an output or results variable. Both models also include various levels of evaluating results. For instance, the survey items that reflect CHANGE ACHIEVEMENT include evaluating individual perceptions about the success of the change and the effectiveness of the implementation process itself. This is similar to the congruence model’s notion of evaluating organizational performance results at the individual level.

Differences from CQM Model

The CQM model differs from the congruence model in a number of ways. On a general level, one can view the CQM model as more “specialized” and focused on the change process itself. The congruence model is a general model of organizational functioning that can be applied to a change situation. The constructs of the CQM model, such as CHANGE DETERMINATION, SKILL DEVELOPMENT, and PROMOTION are more specialized to the change process than are the congruence model variables of work, people, formal organization, and informal organization.

Indeed, it could be argued that the basic unit of analysis differs between these two models. In the congruence model, the organization is the unit of analysis; in the CQM model, the unit of analysis leans more towards the specific change event.

Furthermore, the general variables of the congruence model make the diagnosis of specific situations difficult. Recall that diagnosis was a necessary design specification behind the CQM model’s development (section 3.3). Obtaining diagnostic guidance from the congruence model’s four transformation process variables is difficult without elaborating the constructs with more specific reflective items (such as those found in a survey questionnaire).

Diagnosis is also impeded by the congruence concept itself. The notion of congruence implies that there is no one single right way to organize. While the “it depends” premise has
intuitive appeal and some validity, it sometimes offers little diagnostic guidance. For instance, the congruence model provides little insight on such diagnostic issues as what levers of the change process need adjusting and in what ways the levers should be adjusted.

The congruence model does contain some notions that are not specified in the CQM model. The overall notion of the effect of the environment is minimal in the CQM model. The congruence model is one of many organizational models that portray the model as connected to, and influenced by, the external environment (Lawrence and Lorsch 1967). Many theorists believe that significant organizational change is driven primarily by external forces (e.g., Pfeffer and Salancik 1978, Burke and Litwin 1992).

One could argue that the CQM model includes environmental factors in the CHANGE DETERMINATION construct, which requires a determination of the change objective based on an analytical comparison of the organization’s present state to a desired future state, and a consideration of key stakeholders when determining the change necessary. However, the recognition is implicit. Other contextual factors of the congruence model such as the role of history and the influence of the firm’s current resource set in determining and implementing organizational change are not addressed by the CQM model. Lacking explicit attention to the environment, the CQM is more internally oriented than the congruence model.

Two organizational variables of the congruence model receive little attention in the CQM model. One of these variables relates to the congruence model’s notion of “work.” From the congruence model’s standpoint, work represents the substantive activities employed by the organization to create valuable outputs. Substantive work is the building block for the organization’s existence. Nadler and Tushman (1980) asserted that an analysis of an organization’s work (including the different tasks required, specific work flows, and the required task outputs) constitutes an important diagnostic category as part of an organizational assessment. The CQM model does not reflect the diagnostic centrality of substantive work. The organization’s tasks are somewhat captured by SKILL DEVELOPMENT, which considers
identifying the skills and capabilities needed to achieve the change, and providing a means for the organization to acquire these capabilities in an effective manner. There is little consideration of substantive work processes and how activities are configured to create outputs of value.

The congruence model’s notion of “informal organization” is also not well addressed by the CQM model. Informal organization requires consideration of the tacit emergent interactions among organizational members that develop over time. There is little evidence that the CQM model constructs reflect such the notion of informal organizational practices.

One dimension of the CQM model that garners little attention in the congruence model is CONTROL. While it is possible to categorize structure for monitoring and controlling the achievement of change under the congruence model’s formal organization variable, it is noteworthy that the notion of control occupies an prominent position in the CQM model—rather than being buried in a general variable of organizational structure.

3.4.4 Tichy’s change framework

Tichy’s (1983) organizational framework is focused more specifically on the management of change. There are nine organizational change levers:

1. External interface with the organization’s environment
2. Mission or perceived reason for existing
3. Strategy for achieving the mission
4. Managing the mission/strategy process by engaging the relevant interest groups
5. Tasks—work may need to be revised as part of the change
6. Prescribed networks—the formal structure specified by the organization
7. Organizational processes such as communicating, problem solving, and decision making
8. People
9. Emergent networks—the informal structure specified by the organization

The output of the model is organizational effectiveness, which is seen as a “function of the characteristics of each of the components of the model, as well as a function of how the components interrelate and align into a functioning system” (Tichy 1983: 72).

The nine-lever model itself is not particularly unique. Indeed, it is easy to see some overlap between some of Tichy’s change levers and elements of Nadler and Tushman’s (1980) congruence model. What is more unique is Tichy’s overlay of three systems—technical,
political, and cultural (TPC)—across each of the nine levers. The TPC overlay springs from the view that there are three traditional perspectives to viewing organizational change. The technical perspective concerns rationality and is based on the scientific method. The political perspective relates to bargaining and positioning of dominant groups in driving organizational change. The cultural perspective considers how the shared norms and beliefs of the organization influence change.

From a diagnostic perspective, a two dimensional matrix can be developed that lists the nine levers on one axis and the three systems on the other. Each cell in the matrix then represents an evaluation of how much each lever needs to be adjusted using the perspective of each system element. “Alignment” is achieved when each of the nine levers have been satisfactorily adjusted to agree with a particular system. That is, are the nine levers aligned with the technical system? With the political system? With the cultural system?

This additional dimension, the systems dimension, is perhaps the key strength of Tichy’s model. When performing an assessment, the evaluator must assume multiple perspectives of the organization, which presumably would help in making a more accurate diagnosis and intervention.

Like Nadler and Tushman’s (1980) model, Tichy’s framework promotes alignment between the organization and its context. An aligned environment may not respond well to change. Too much alignment may be undesirable when current organizational conditions require unfreezing and movement towards a new state.

*Similarities to CQM model*

Since Tichy’s framework is oriented towards organizational change, it is more closely related to the CQM model of change process. The nine organizational variables of Tichy’s framework represent “levers” that the organization can pull to help implement change. This lever concept is conceptually similar to the major constructs of the CQM model. Each construct of the CQM model, such as *STRUCTURAL SUPPORT*, *SKILL DEVELOPMENT*, and *BEHAVIOR*
*MANAGEMENT*, can be viewed as category of activities that require attention and configuration in order to achieve change. Both models also portray a relationship between these change process variables and an output variable of organizational performance or achievement.

Some of the CQM model constructs are readily reflected in Tichy’s model. *CHANGE DETERMINATION* can be moderately supported by the strategy/mission and interest group management variables in Tichy’s model. *STRUCTURAL SUPPORT* is moderately supported by the structure and organizational process variables.

*Differences from CQM Model*

Although Tichy’s framework is oriented towards organizational change, the unit of analysis tends to be of higher order than the CQM model. Similar to Tushman and Nadler’s (1980) model, the unit of analysis for the Tichy framework is the organization rather than the specific change event. This is best seen by the lack of a variable that addresses specific change initiatives. The Tichy model, rather, appears more focused on how the organization implements or aligns with its long-term strategy and mission.

As such, the diagnostic potential of the Tichy framework with regards to a specific change initiative is in question—unless the organizational variables are elaborated in the context of change management.

Like Nadler and Tushman’s (1980) model, Tichy’s framework includes interaction with the environment. As noted previously, the external environment is not widely treated by the CQM model.

Tichy’s TPC overlay also brings some perspectives not present in the CQM model. Tichy suggests that the nine change levers to be evaluated from the technical, political, and cultural perspectives of the organization. The CQM model focuses on the technical perspective. The constructs of the CQM model represent a rational progression from goal determination, to implementation, to goals achievement. The CQM framework does not strongly reflect political or cultural perspectives of change.
Tichy’s framework contains two organizational variables that are not directly addressed by the CQM model. These variables are similar to the “work” and “informal organization” variables of the Nadler and Tushman’s (1980) congruence model. The notion of task, as it pertains the configuration of substantive work to obtain the organization’s product or service output, is not well addressed by the CQM model. The notion of emergent networks, informal or unplanned organizational linkages that appear during the implementation of change, is also not addressed by the CQM model.

Similar to the comparison with the congruence model, Tichy’s change framework makes little explicit reference to the notion of structures for monitoring and control of the change’s implementation. CONTROL is a core construct in the CQM model.

### 3.4.5 Kotter’s change process

Kotter’s (1995, 1996) model of change is a “hands-on” model aimed at the leaders of the organization that make change happen. It is also focused on major change initiatives in the organization. Such “transformations” are usually driven by major environmental shifts that prompt the organization to change. The model derives from empirical comparison of failed efforts at organizational transformation and to successful transformations.

Kotter proposed that the process of producing successful change has eight stages:

1. Establishing a sense of urgency. Examining the market and competition, followed by an identification and discussion of potential crises and major opportunities.
2. Creating a guiding coalition. Assembling a group with enough power to lead the change while at the same time working together as a team.
3. Developing a vision and strategy. Creating a vision to help direct the change effort and developing strategies for achieving the vision.
4. Communicating the change vision. Using every means possible to communicate the new vision and strategies, including a modeling of expected behavior by the coalition team.
5. Empowering broad-based action. Getting rid of obstacles, changing systems or structures that undermine the vision/strategy, and encouraging risk-taking and non-traditional ideas.
7. Consolidating gains and producing more change. Using the credibility generated from early wins to change all systems, structures, and policies that don’t fit the vision. Hiring, promoting, and developing people who can implement the vision.
8. Institutionalizing new approaches in the culture. Creating better performance through better market-related behavior, better leadership, and more effective management. Articulating the
relationship between new behaviors and organizational success. Creating the means to ensure leadership development and succession.

It is implied that this change process is related to successful change achievement.

Tying to Lewin’s (1958) unfreezing→movement→refreezing model of organizational change, Kotter notes that the first four steps help defrost the hardened status quo. Steps 5 through 7 introduce many new practices. Step 8 anchors the changes in the organization’s culture. The simple, stepwise design of Kotter’s model suggests that it was designed for use by practitioners to guide them in implementing change.

Similar to Tichy’s framework, Kotter considers multiple organizational perspectives of organization such as marshalling a powerful coalition to drive the change, and the use of culture to solidify the change.

Kotter’s model differs from other scholarly models of change. The eight constructs in the model are arranged in a sequential fashion. Unlike other organizational models that make use of bi-directional arrows to indicate the nonrecursive relationships between variables, there is a strong implied causality in Kotter’s model from the early thawing activities to the refreezing stage. Since this model is meant to be a hands-on one, the steps guide leaders towards a straightforward diagnosis of what needs to be changed in order to achieve change.

A number of constructs present in other models are not well articulated in Kotter’s model. For example, there is little attention paid to the work or task necessary to achieve the primary outputs of the organization. Compared to the Nadler and Tushman’s (1980) congruence model and Tichy’s (1983) change framework, Kotter’s model appears oriented towards large-scale change events. With the large degree of attention paid to the involvement of leaders in the change process, it seems doubtful that this model fits the situation where the change to be implemented is narrow in scope.

Kotter’s model is focused on the dynamics of change. The congruence model (Nadler and Tushman 1989) and Tichy’s (1983) change framework are largely static models of
organizational functioning. The latter provide insight on organizational variables and relationships when the organization has achieved a steady state. Kotter’s model is more dynamic, since it focuses on managing Beckhard and Harris’ (1977) transition state as the organization moves from current to future conditions.

*Similarities to CQM Model*

The unit of analysis of the Kotter model is similar to that of the CQM model. Both models address the specific change event being implemented. It is also similar to the CQM model in that the primary audience is the manager, rather than the scholar.

The variables of Kotter’s model overlap with a number of CQM model constructs. Creating a vision of the future and strategies to achieve the mission is similar to the *CHANGE DETERMINATION* construct of the CQM model. Both models include the notion of determining a future state and developing change to get there. Kotter’s notions of establishing a sense of urgency, communicating the change vision, and planning to generate short term wins embodies both the *PROMOTION* and *SUCCESS SHARING* constructs of the CQM model that deal with communication. Empowering broad-based action is closely connected to the *STRUCTURAL SUPPORT* construct and somewhat connected to the *SKILL DEVELOPMENT* construct since both constructs aid empowerment. The CQM construct of *BEHAVIOR MANAGEMENT* can be found scattered in the content of Kotter’s variables of generating wins, producing more change, and institutionalizing change.

*Differences from CQM Model*

Kotter’s model employs Lewin’s (1958) general sequence of unfreezing, moving, and then refreezing the organization. As noted above, the eight steps of the model proceed in this general path. It is unclear how the CQM model constructs map onto this sequence. For example, is *SKILL DEVELOPMENT* an unfreezing, moving, or freezing variable? In Kotter’s model, *SKILL DEVELOPMENT* appears related to late stage (steps 7 and 8) refreezing activities.
A number of such sequential differences are apparent between the two models. Kotter’s seventh step relates to using early wins to change much of the organization’s systems and reporting structure. Kotter infers that such changes should be delayed until initial wins are realized. The CQM model specifies no such lag between early wins and wholesale change to organizational structure and systems. Indeed, structural and systematic changes are largely handled in the STRUCTURAL SUPPORT construct, which is an “early” variable in the CQM model.

Kotter’s model includes the development of a “coalition team” to manage the change. While the CQM model mentions the importance of leadership in setting behavioral examples, being involved in communications about the change, and being accountable, the notion of a change agent or coalition team is not highlighted in the CQM model.

Consistent with the comparison to other models, there is little direct equivalent to the CQM model’s CONTROL construct in Kotter’s model. Kotter’s model does not highlight structure for monitoring the progress of the change and diagnosing and correcting problems with the change process.

3.4.6 Burke and Litwin’s model of organizational development and change

Burke and Litwin (1992) presented their model of organizational development and change as being unique from other models in that it specified causality between various organizational components and between the organizational components and organizational performance or output. The authors claimed that most organizational models, such as the Tushman and Nadler (1980) congruence model or Tichy’s (1983) change framework, did not provide a clear enough picture of cause and effect relationships between the organizational variables and performance.

Like many organizational models, the Burke-Litwin model is empirically derived, based on the authors’ organizational consulting work. Although the authors acknowledged an unavoidable linkage to theory based on their training, such as incorporating the open systems
notion from Katz and Kahn (1966), the specific components of the model evolved from fieldwork. Indeed, their formal work to validate their model (Burke and Litwin 1992) admittedly occurred *ex post* the model’s development. Somewhat tentatively, they admitted to asking an unorthodox academic research question: “This seemed to have worked in practice; I wonder if the literature supports our action?” (Burke and Litwin 1992: 524)

A basic premise behind the Burke-Litwin model is that organizational dynamics (assumed to be something equivalent to change situations) can be divided into two sets. One set of dynamics relates to the transactional change—daily interactions between individuals that define local changes and improvements in the workplace. Such exchanges help define the “climate” of the organization. The second set of dynamics relates to processes of organizational transformation. Unlike transactional dynamics, transformational processes are required for genuine change to the culture of the organization. It is assumed that such cultural change is vital to achieving large-scale change. The Burke-Litwin model contains 12 organizational variables:

1. External environment. Any outside condition or situation that influences the performance of the organization.
2. Mission and strategy. What managers declare as the organization’s mission and strategy AND what employees believe is the central purpose of the organization.
3. Leadership. Executives providing overall organizational direction and exhibiting model behavior for employees.
4. Culture. The collection of overt and covert rules, value, and principles that are enduring and guide organizational behavior.
5. Structure. The arrangement of functions and people into specific areas and levels of responsibility, decision-making authority, communication, and relationships to assure effective implementation of the organization’s mission and strategy.
6. Management practices. Clusters of specific behaviors exercised by managers to carry out the organization’s strategy (e.g., encouraging innovation from subordinates).
7. Systems. Standardized policies and mechanisms that facilitate work, primarily manifested in the organization’s reward systems, information systems, and control systems.
8. Climate. Collective impressions, expectations, and feelings of local work unit members.
9. Task requirements and individual skills/abilities. The required behavior for task effectiveness, including specific skills and knowledge of people needed to accomplish required work.
10. Individual needs and values. Specific psychological factors that provide desire and worth for individual actions or thoughts.
11. Motivation. Behavioral tendencies towards achieving goals, taking action, and persisting until satisfaction is attained.
Individual and organizational performance. Outcomes and results as well as indicators of effort and achievement (such as productivity, customer satisfaction, profit, and quality). Performance is assessed at both the organizational and individual level.

These variables can be grouped into two sets representing the transformational and transactional change constructs. The transformational factors include the external environment, mission and strategy, leadership, culture, and individual and organizational performance. The transactional factors include structure, management practices, systems, climate, task requirements and individual skills, individual needs and values, motivation, and individual and organizational performance.

This attempt to differentiate between two categories of change is unique among organizational models. Most models of change do not consider the scope or type of change as a dimension or antecedent to the change process, or that the change process might differ depending on the type of change being implemented.

Compared to other organizational models, the Burke-Litwin model contains more variables. The authors claim that this is due to the complexity of organizations. More parsimonious models perhaps do not capture the multivariate richness present in the socially complex organizational environment.

Burke and Litwin claimed that a major advantage of their model over other models of organizational change and development is that the Burke-Litwin model includes causality among the variables. Although two-way arrows dominate the linkages between variables in the model (similar to other organizational models), the authors are careful to note that significant causality is still implied by the model. For example, when implementing large-scale change, the authors propose that the transformational variables have more influence (relative to the transactional variables) in determining organizational performance. If the model were quantitatively evaluated in the context of transformational change, a path analysis would indicate stronger beta coefficients for the transformational variables in a model where performance was the dependent variable (Burke and Litwin 1992: 535).
Although the attempt to design causal order into their model is noble, an obvious path through the Burke Litwin model is not much more apparent than in other models. Most relationships in the Burke-Litwin model are portrayed with two-way arrows—similar to Nadler and Tushman’s (1980) congruence model and Tichy’s (1983) change framework. Like the other models, a general path from the environment and from strategy development through organizational variables towards some type of output or results is apparent. Since these models were all selected for their proximity to teleological change theory (Van de Ven and Poole 1995) a general path from change determination to change achievement should be expected.

The Burke-Litwin model has been formally linked to underlying literature streams (Burke and Litwin 1992). For instance, the structure construct is tied to the literature on organizational design (Galbraith 1974), and the construct of task requirements and individual abilities is tied to theory on job design (Hackman and Oldham 1976, Campion and Thayer 1987, Herbert and Dresky 1987). Although presented by the authors after the model was derived, this demonstration of content validity is lacking in the development of other models of organizational development and change.

Similarities to the CQM Model

Both the Burke-Litwin model and the CQM model flow from goal determination towards goal achievement. Since the CQM model is more parsimonious, much of the content of the CQM model is spread across multiple Burke Litwin variables. *Skill Development* relates well to the Burke Litwin variable of task requirements and individual skills and capabilities. *Structural Support* can be linked to the Burke-Litwin variables of structure, management practices, and systems. *Behavior Management* relates somewhat to the Burke Litwin variable of motivation.

Both models include an outcomes construct. In both models, outcome is evaluated at the individual as well as the organizational level.
Differences from CQM Model

The Burke-Litwin model includes more categories of variables than the CQM model. Some of these categories contain concepts not explicitly addressed by the CQM model. In particular, the Burke-Litwin variables of environment, leadership, culture, climate, individual needs and values are not directly addressed in the CQM model.

An important feature of the Burke-Litwin model is the separation of organizational variables that pertain to particular types of change. Transformational change requires attention to different organizational variables than does transactional change. The CQM model is oblivious to the type of change being implemented in the organization.

The CQM model contains variables that focus on the management of a specific change event. For instance, CHANGE DETERMINATION focuses on the analysis of a particular change situation than does the mission and strategy variable in the Burke Litwin model. The communication constructs of PROMOTION and SUCCESS SHARING are not directly addressed in the Burke-Litwin model. The CQM construct of CONTROL garners no prominent position in the Burke-Litwin model. Instead, control systems are embedded in the Burke-Litwin general variable of “systems.”

3.4.7 Key findings when comparing the CQM model to theoretical models

Table 3.8 summarizes salient features of the four theoretical models discussed above. The table also includes an estimate of how well the content of each theoretical model covers the content of the CQM model construct (H=high level of coverage, M=medium level of coverage, L=low level of coverage). Important similarities between the CQM model and the theoretical models include:

Teleological framework. The group of scholarly models and the CQM model fit Van de Ven and Poole’s (1995) category of teleological change theory. Each model includes variables that reflect the development of organizational goals and objectives and variables that address
implementing those objectives. There is at least an implied path through these variables towards goal achievement.

Table 3.8: Summary of Theoretical Models and Comparison to CHANGE PROCESS Constructs

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<td>Distinguishing features</td>
<td>Input(\rightarrow)transformation process(\rightarrow)output design. Organizational variables should be in “congruence” depending on the situation.</td>
<td>9 organizational change “levers.” Evaluating each lever using technical, cultural, and political perspective of change.</td>
<td>8 steps to managing change. Based on Lewin’s (1958) notion of unfreezing-moving-refreezing the organization.</td>
<td>12 organizational variables. Closely tied to research on climate and culture in the organization.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHANGE DETERMINATION</th>
<th>L (environment, strategy)</th>
<th>M (mission, strategy, interest group management)</th>
<th>H (developing vision and strategy)</th>
<th>M (mission and strategy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRUCTURAL SUPPORT</td>
<td>H (resources, formal organization)</td>
<td>H (prescribed networks, organizational processes)</td>
<td>M (empowering action, consolidating gains, institutionalizing change)</td>
<td>H (structure, systems)</td>
</tr>
<tr>
<td>SKILL DEVELOPMENT</td>
<td>H (work and people)</td>
<td>H (tasks, people)</td>
<td>M (empowering action, consolidating gains, institutionalizing change)</td>
<td>H (task requirements and individual skills/capabilities)</td>
</tr>
<tr>
<td>PROMOTION</td>
<td>L (strategy, formal organization)</td>
<td>M (organizational processes)</td>
<td>H (establishing sense of urgency, communicating vision)</td>
<td>M (leadership, climate)</td>
</tr>
<tr>
<td>SUCCESS SHARING</td>
<td>L (formal organization)</td>
<td>M (organizational processes)</td>
<td>H (generating short term wins)</td>
<td>L (leadership)</td>
</tr>
<tr>
<td>BEHAVIOR MANAGEMENT</td>
<td>M (formal organization)</td>
<td>M (organizational processes)</td>
<td>M (consolidating gains and producing more change, institutionalizing change)</td>
<td>M (motivation, culture)</td>
</tr>
<tr>
<td>CONTROL</td>
<td>L (formal organization)</td>
<td>L (organizational processes)</td>
<td>L (institutionalizing change)</td>
<td>L (systems)</td>
</tr>
<tr>
<td>CHANGE ACHIEVEMENT</td>
<td>H (multi-level organizational output)</td>
<td>M (output)</td>
<td>M (output)</td>
<td>H (individual and organizational performance)</td>
</tr>
</tbody>
</table>

Concepts/constructs not included in CQM model
- Connection to external environment.
- History and resources as key organizational inputs.
- Organizational variable of informal organization.
- Connection to external environment.
- Relating the change to political and cultural perspectives.
- The variable of “emergent networks”, or informal organization that evolves over time.
- Variables that explicitly address Lewin’s notion of unfreezing\(\rightarrow\)movement\(\rightarrow\)refreezing.
- Establishing a coalition team to manage change.
- Transformational change is different from transactional change. The variables of environment, leadership, culture, climate.

H = High amount of coverage of CQM construct in theoretical model
M = Medium amount of coverage
L = Low amount of coverage
Common variables. As such, variables that are common to both the scholarly models and the CQM model include:

- Development or specification of the change objective that is to be achieved
- The general administrative structure and systems of the organization
- Capabilities or skills development required to achieve the change
- An output variable related to organizational performance or goal achievement

To some extent, the models also share common variables relating to systems for managing individual behavior and for monitoring and control of the changes’ implementation. However, as noted above, in most scholarly models, these variables are less prominently displayed than in the CQM model.

Important differences between the CQM model and the theoretical models include:

Variables more specific to change implementation in the CQM model. Many “change models” in the literature are actually models of organizational functioning and performance that are applied to the change context. Nadler and Tushman’s (1980) congruence model, Tichy’s (1983) change framework, and the Burke-Litwin (1992) model all resemble this classification of change model. In most scholarly models, the unit of analysis leans towards the organization rather than the specific change event.

In contrast, the constructs of the CQM model are tightly specified around issues of change process. For example, CHANGE DETERMINATION is more specific that a general “strategy” or “mission” variable found in Nadler and Tushman (1980), Tichy (1983), or Burke and Litwin (1992). Similarly, SKILL DEVELOPMENT is more specific than the general “people” variable evident in many theoretical models. Of the four scholarly models reviewed, Kotter’s (1995, 1996) variables most closely resemble those in the CQM model. Both models specify variables centered on the specific change event, which makes diagnosis of a change event using the model more straightforward.
The task construct given low level of prominence in the CQM model. Many scholarly models have built upon Leavitt’s (1965) conceptualization of organizations as multivariate systems with four interacting variables: people, task, structure, and technology. Nadler and Tushman’s (1980) congruence model, Tichy’s (1983) change framework, and the Burke-Litwin (1992) model all employ Leavitt’s basic organizational model.

The task variable plays a central role in many organizational models. To some authors, work task is the major reason for the organization’s existence. For example, Nadler and Tushman (1980) suggested that understanding of how work tasks achieve critical organizational outputs is critical to a good diagnostic assessment, since how work is configured and executed influences other organizational design variables. An effective portrayal of an organization’s work task configuration is Porter’s (1985) “value chain” framework. The value chain portrays the organization as a combination of operational and support activities configured to produce outputs of value and usually in accordance with organizational strategy.

The importance of substantive work to organizational performance absorbs scholarly thought in other disciplines. For example, economists and strategy scholars obsess over how organizational capabilities and skills are combined to create outputs of values and competitive advantage. Perrow (1967) suggested that how an organization’s technology is applied to alter raw materials forms the basis for analyzing the organization. Tregoe and Zimmerman (1980) proposed nine categories of decisions variables that defined a task-oriented configuration of the organization, including product or services offered, market needs, technology, production capabilities, method of sale, method of distribution, natural resources, size and growth, profit/return on investment.

Attention to the substantive work task is not a prominent construct of the CQM model. Indirectly, it receives treatment under STRUCTURAL SUPPORT and SKILL DEVELOPMENT. STRUCTURAL SUPPORT considers the provision of resources and systems that will help implement the change. SKILL DEVELOPMENT includes the identification and acquisition of
any new skills and capabilities needed for the change to be achieved. Some changes, however, such as new market entry, should demand more direct attention to how work tasks are organized or configured in the value chain. Focus on value chain (re)configuration is not a part of the CQM model.

**Low prominence of “open system” perspective in CQM model.** Many scholars have incorporated Lawrence and Lorsch’s (1967) open systems notion into their organizational models. Frequently, “environment” is specified as a high level variable. The environment is not prominently addressed in the CQM model. *CHANGE DETERMINATION*, for instance, does not necessarily require an environmental analysis as part of the process. Indeed, the constructs of the CQM model appear more focused on internal processes or activities necessary to implement change.

**Little treatment of informal/political/cultural perspectives in CQM model.** When compared to Tichy’s (1983) three perspectives of change, the CQM model is mainly grounded in the technical perspective. The political and cultural perspectives are less prominently treated. The CQM model has a rational flavor based on the careful analytical determination of the proper change to be implemented, and then adjusting organizational levers to achieve the change. Issues of organizational power (Pfeffer 1981) or culture (Schein 1985) are indirectly treated at best. Most scholarly models, such as the four reviewed here, include variables that address informal organizational relationships, culture, politics, climate, and the like.

**The CQM model’s CONTROL construct.** In the theoretical models we reviewed, the concept of managerial control processes was buried so deep in general categories (such as Burke and Litwin’s 1992 “systems” variable) that it is easy to assume that the theorists place only secondary emphasis on the concept control for achieving change. In the CQM model, the control concept is raised to a high level of prominence, since *CONTROL* represents one of the seven fundamental change process constructs. Of all individual concepts of the CQM model, the one that appears most unique when compared to scholarly change models is the concept of control.
3.5 Validity of CQM Model

In the earlier sections of this chapter, we examined the CQM model from a variety of perspectives. First, we examined the process by which the model was developed (section 3.2). Next, we undertook a detailed examination of the individual constructs of the CQM change process model (section 3.3). Finally, we compared the overall CQM model framework with prominent scholarly models of organizational change (section 3.4). These investigations helped us understand more precisely what the CQM model was about. But perhaps more important from a research perspective, these exercises provide insight into the validity of the model. In this section we initiate a discussion of the validity of the CQM model—a discussion that will be completed in Chapter 4.

3.5.1 The notion of validity

In a general sense, a model’s validity relates to the degree to which the model captures what is intended to be captured. Validity comments on the model’s trueness or accuracy.

In the research conventions of normal science, model validity is frequently construed from an evaluation of the measurement device used to express, or to operationalize, the model. A measurement instrument’s validity is related to the question: Are we measuring what we think we are measuring? (Kerlinger 1973: 457) It is the extent to which an instrument actually measures what it alleges to measure (Carmines and Zeller 1979). Validity focuses on the extent of matching, congruence, or goodness of fit between an operational definition and the construct it is purported to measure (Singleton et al. 1993).

Unfortunately, validity itself is a construct—an abstraction that exists only in people’s minds. Validity cannot be measured directly. Rather, it must be inferred from assessing items that reflect some aspect of the validity construct.

Researchers have identified various aspects of validity. In addition, scholars have assigned a number of labels to each aspect of validity. In reviewing how scholars have explored
the issue of validity, one can identify at least four general categories of questions that the researcher is trying to answer about the validity of a model:

1) **The relationship between the model and previous theory.**

What is the relationship between the model and what is theoretically (or conceptually) known about what the model purportedly represents?
Does the operationalized model represent the universe of possible items that could be included in the model?
Are the items that bring the model to life part of the right theoretical domain?
Are there certain portions of the theoretical domain that are not represented in the model?

2) **The relationship between the model and reality.**

Does the model sit well with those who operate in the model’s theoretical domain?
In the case of empirical models, does the model ring true to practitioners?
Does it adequately represent reality to those who operate in the domain of the model?
How well is the model regarded by those who use the model?

3) **The ability to accurately express the model using a measurement device.**

Does the measurement model adequately represent the purported variables and relationships that have been theoretically specified?
How strong is the relationship between items that are intended to measure the same construct?
Are the constructs and the details that bring the model to life independent—or is there significant overlap between the operationalized constructs?
In repeated assessments using the model, is there sufficient uniformity between runs?

4) **The relationship between the model and external phenomena.**

How well does the model predict outcomes of interest?
How well does the model relate to other models or processes of interest?

We explore each of these dimensions of validity with regards to the CQM model.

First, we are interested in determining the how well the empirically grounded CQM model aligns with theoretical precedents. We will refer to this dimension as **content validity** (represented by the first set of questions noted above). A valid model specifies variables and relationships in harmony with previous theory. As Nadler (1980a) suggested, the ramifications of employing a model that is inconsistent with what is known about organizational phenomena should be carefully considered.
Next, we consider the model’s *face validity* (represented by the second set of questions noted above). That is, does the model appear to reasonably represent reality as seen by practitioners? Obviously, face validity is important for a model to be adopted by organizations in a self-assessment mode.

Third, we are interested in how well the model measures or reflects the underlying latent constructs. We will term this dimension *construct validity* (represented by the third set of questions noted above). Construct validity is frequently evaluated quantitatively, using a survey instrument or similar device for generating quantitative data that describes the model. In this investigation, we subject the CQM survey instrument to quantitative evaluation aimed at determining the measurement model’s construct validity.

Finally, we consider how well the model correlates to a key output of interest—the achievement of change. We term the ability of a model to predict such an outcome as *criterion-related validity* (represented by the fourth set of questions noted above). Indeed, criterion-related validity is frequently the objective behind building the model to begin with.

At this point in our investigation we are currently positioned to answer questions about the CQM model’s content validity and face validity. We must reserve assessment of construct and criterion-related validity until Chapter 4, when we evaluate the measurement model expressed by the CQM survey instrument.

### 3.3.2 Content validity of the CQM model

Content validity reflects the degree to which a model spans the domain of a construct’s theoretical definition. When the model is expressed as a measurement instrument (such as a questionnaire), content validity can be assessed by the extent to which the items in the instrument reflect the theoretical domains of the various constructs.

It is rarely possible, however, to specify and randomly sample from the universe of items reflecting the construct’s domain. Rather, assessments of content validity have typically relied on “appeals to reason regarding the adequacy with which important content has been sampled and on
the adequacy with which the content has been cast in the form of measurement items (Nunnally 1967: 82). Some scholars also claim that it might be possible to infer content validity from the manner in which a model or measurement instrument was constructed (DeVellis 1991).

The assessment of content validity is almost always a subjective exercise. Although some quantitative methods utilize numerical data obtained from expert panel assessments of survey instrument coverage of the subject matter (e.g., Lawshe 1975), qualitative approaches dominate. The general approach is to define the theoretical domain from which the model’s content originates, and then, after comparing the content to the theoretical domain, to express an opinion on how well the model covers the domain.

There are two important questions that should be answered by an assessment of content validity. First, does the content of the model belong to the correct theoretical domain? Second, does the model exclude something that should be included to more accurately express the theoretical domain?

The issue of content validity is particularly pertinent to the CQM model. Unlike academically derived models, where the scholar typically builds a model after carefully connecting to the theoretical domain defined in the literature, the CQM model was largely derived from empirical wisdom and experience. The developers of the CQM model made no formal review of the theoretical literature on change management prior to building the model.

It is important, therefore, to understand the CQM model’s relationship to the scholarly literature before proceeding further in theory development. To assess content validity of the CQM model, we reflect on our findings from the previous three sections.

**Model development process.** First, we investigated the process by which the CQM model was developed (section 3.2). During the 12-18 months required to develop and refine the model, the study group employed a number of methodologies to build rigor into the model’s development, including use of structured methods to capture and categorize qualitative data, field testing of
preliminary survey drafts, and disciplined cycles of review and revision to the survey questionnaire.

Unlike the conventional approach employed by scholars, the study group first generated a questionnaire to express their model, and then, after honing the measurement model based on field feedback, developed a conceptual narrative that supported the instrument. Academics usually do the opposite. First, a conceptual model is extracted from previous theory in narrative form. The conceptual narrative is then converted into some type of instrument that expressed the conceptual model. It should be noted, however, that although this latter approach is the proclaimed academic convention, scholars have sometimes admitted to proceeding quite like the CQM study group in their model development (e.g., Burke and Litwin 1992). Indeed, the notion of developing theory that has been grounded in data does have theoretical precedent, particularly among social scientists (e.g., Glaser and Strauss 1967).

**Individual construct content.** Second, we “drilled down” into the individual CQM model constructs and compared the constructs’ content with relevant literature streams. Overall, we found substantial support for the CQM construct’s content in the literature (Table 3.7). The CQM model appears to be an integrative one, since supporting literature can be drawn from diverse streams such as organizational theory, strategic management, organizational learning, and managerial control.

Are there theoretical concepts that are not included in the individual CQM model constructs but should be? The *STRUCTURAL SUPPORT* does not directly address the reconfiguration of organizational tasks or reporting relationships that scholars have related to achieving organizational objectives and change (e.g., Chandler 1962). Moreover, *STRUCTURAL SUPPORT* does not express the importance of the coalition that frequently leads the change and is responsible for change achievement (e.g., Kotter 1995). Reference to the role of leadership is not omitted entirely, however. Items related to the senior management’s participation in the
change effort can be found in items under *PROMOTION, SUCCESS SHARING*, and *BEHAVIOR MANAGEMENT*.

Does the content of the CQM suggest extend or redefine the theoretical domain related to change process? The one area that contributes a fresh theoretical perspective is *CONTROL*. Although organizational scholars have prescribed the importance of change monitoring and evaluation, the theoretical development of this notion in the change literature is minimal. By borrowing notions from the literature on managerial control systems, *CONTROL* contributes to an integrative model of change process that highlights the importance of change monitoring, diagnosis, and corrective action in the achievement of change.

**Comparison of overall model to theoretical frameworks.** Finally, we compared the CQM model to some prominent change models in the literature. The CQM model resembles many academic change models in that it reflects the teleological category of change process theory (Van de Ven and Poole 1995). Teleological change models specify change as flowing from the development of goals, the implementation of the goals, and subsequent revision.

However, the CQM model differs from scholarly models in a number of ways. The CQM model focuses around the individual change event as opposed to organizational change in general. As noted above, the CQM model does not directly address the role of evaluating and changing the substantive work or task required by the change although it is prominently featured in many theoretical models (e.g., Nadler and Tushman 1980, Tichy 1983, Burke and Litwin 1992). The CQM model highlights the importance of managerial control in the change process—an item that is suppressed in many scholarly models.

We summarize our assessment of content validity in Figure 3.12. If we were to add anything to the CQM model, it would be individual questions under some categories to “fill out” the conceptual domain of the categories. These items would include:

- How does the current change being considered relate to previous changes initiated by the organization? (The role of history and the environment in *CHANGE DETERMINATION*.)
• Have reporting relationships been adjusted to support the change? (The classic structural variable associated with STRUCTURAL SUPPORT)
• Have the key individuals or groups that must champion the change been recruited? (The role of the change agent and powerful coalitions in STRUCTURAL SUPPORT)
• How has the organization’s value chain been reviewed and reconfigured to support the change? (The role of assessing substantive work and task alignment as part of STRUCTURAL SUPPORT).

Our view is that the CQM model possesses substantial content validity. The CQM model expresses change process at the individual change level. The constructs of the CQM model represent organizational variables that must be diagnosed and adjusted as part of the implementation of change. As such, the CQM model appears capable of diagnostic information well grounded in theory.

**Figure 3.12: Summary of CHANGE PROCESS Content Validity Assessment**

<table>
<thead>
<tr>
<th>High Expression in CHANGE PROCESS Model</th>
<th>Low Expression in Theoretical Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>The concept of control in change process.</td>
<td>Role of the environment and history.</td>
</tr>
<tr>
<td>Diagnostic framework at the individual change level.</td>
<td>Impact of power, politics, informal organization.</td>
</tr>
<tr>
<td>Goal→Implementation→Results perspective of organizational change (teleology).</td>
<td>Role of task or work structure.</td>
</tr>
<tr>
<td>Rational approach.</td>
<td>Changes in reporting relationships.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low Expression in CHANGE PROCESS Model</th>
<th>High Expression in Theoretical Literature</th>
</tr>
</thead>
</table>

3.3.3 Face validity of the CQM Model

Face validity represents judgments about a measurement instrument after it has been constructed to operationalize a theoretical construct. These judgments focus on the degree to
which items in a measurement instrument appear, on face value, to measure the single construct that they intend to measure (Nunnally 1967).

Some see face validity as separate from content validity (DeVellis 1991, Kerlinger 1973), while others see them as two sides of the same coin (Carmines and Zeller 1979). The latter camp views the assessment of a measurement instrument’s face validity to be an indirect approach to the assessment of content validity.

Our position here differs somewhat. We view face validity as the degree of truth or correctness of a model as perceived by the people whose social condition the model is intended to represent. The issue relates to how well the model represents reality by those people in reality as defined by the scope of the theory. This view of face validity seems particularly appropriate for a model designed for use by practicing managers in a self-assessment mode. If the CQM model does not ring true to practicing managers, then it has little face validity.

Face validity of the CQM model can be inferred from a number of events that transpired during the model’s development:

**Development by practicing managers.** More than 20 managers were contributors to the CQM model’s development. These managers held mid- to upper-level positions in their organizations. A number of contributors were the chief quality officers of their organizations. Others came from varied backgrounds. For example, a vice president of manufacturing and a marketing director were regular contributors to the efforts. Development of the survey by practitioners obviously ensured a certain built-in level of face validity.

**Use of test groups.** As described in section 3.2, the study group utilized groups of practicing managers to obtain feedback on the survey’s content at various stages of the model’s development. A primary goal of the alpha and beta test groups was to obtain feedback on the substantive content of the survey questions (“Are we asking the right things?”) and on the survey presentation (“Are we asking questions in the right way?”).
Early feedback on substantive content suggested that there should be more questions on the results obtained from the change. Consequently, the study group developed a separate survey category to reflect the achievement of change results. The final versions of the survey garnered few additional suggestions or criticisms of substantive content. One suggestion was to add a question related to identifying the individuals or groups that will manage the change initiative (our content validity analysis above noted the same issue). However, most comments were similar to the feedback obtained from this head of corporate quality at a German multinational firm, “All elements and steps of the change process (expressed in the survey) fit my personal experience.”

Most alpha and beta test feedback focused on presentation. Many managers did not like the abstract, academic-like wording of the early survey versions. They also complained of the time necessary to muddle through the lengthy behavioral anchors (early versions of the survey often required 30 minutes to one hour to complete). This is certainly a disadvantage of using behavioral anchors; a tour through Appendix 1 highlights the increased reading burden of the anchors. The later versions of the survey apparently resolved some these issues. Users of the final version of the survey had virtually no feedback on presentation. The time required to complete the final version of the survey ranged from 15 to 30 minutes.

**Enthusiasm of outsiders.** During the alpha and beta phases of the model’s development, the president of the CQM was calling on member organizations in other chapters around the US. Occasionally, he shared a draft of the CQM survey with some managers. On more than one occasion, the managers enthusiastically embraced the survey, literally, since the president had to battle for control of his briefcase copy. Although warned that the survey was only a draft version, the enthusiasts responded in effect, “Yes, but we can use this right now.”

**Presentation to executives.** Coinciding with the completion of the beta test (about 9 months into the study group’s effort), a presentation of the study group’s results was arranged. The attendees were executives from local CQM member organizations. Approximately 30 senior managers
listened to the presentation and participated in an exercise utilizing the survey instrument. Although the objectives of this presentation leaned towards recognition and promotion, the strong acceptance and enthusiasm signaled by these executives provided additional support of the model’s usefulness.

As an additional test of face validity, we reviewed over 100 articles from the popular press that dealt with change management (see Appendix 3). We read and marked up these articles, with a primary objective of testing the validity of the categories and items of the CQM model against an additional group of empirical observations. Although some categories of the model were mentioned more times than others, we found additional evidence of face validity in our review of these empirical articles.

In summary, the CQM model appears to garner considerable face validity among practitioners. Of course, since the model’s developers were themselves practicing managers, a high degree of face validity should have been expected. Such face validity is particularly important for an instrument designed ultimately for use by managers in a self-assessment mode.
Chapter 4: The Measurement Model

4.1 Construct Validity

4.1.1 General approach

In this section, we evaluate the construct validity of the CQM model. Construct validity can be viewed as the degree to which a conceptual model is accurately expressed in a measurement instrument.

The measurement model under scrutiny is derived from the survey questions in Table 3.6 (the entire survey appears in Appendix 1). An abbreviated list of the survey questions (referred to below as “items” or “indicators) appears in Table 4.1 along with the theoretical constructs.

To evaluate construct validity, we follow the general two-step process proposed by Anderson and Gerbing (1988). First, exploratory factor analysis (EFA) (Child 1970, Joreskog and Sorbom 1979) is used to provide preliminary information about the dimensionality of the model. Such guidance is particularly useful in the absence of sufficiently detailed theory about the relationships between the indicators and their corresponding constructs.

However, EFA alone is insufficient for determining unidimensionality. Unidimensionality refers to the existence of a single trait or construct underlying a set of measures (Churchill 1979, McDonald 1981, Hattie 1985). A model with unidimensional measures is usually desirable, since unidimensional indicators reflect only one underlying construct. It is possible for an indicator to relate strongly to other within-group constructs (known as “internal consistency”) while at the same time correlating highly with indicators of other constructs. Unidimensional indicators correlate highly with other indicators of the same latent construct while exhibiting little correlation with indicators of other constructs. Strong “external consistency” characterizes effective unidimensional measures.

After our preliminary EFA, therefore, we conduct a confirmatory factor analysis (CFA). Contrary to the EFA condition where an indicator can load on more than one factor, CFA is based
on a model in which a set of indicators is assigned a single underlying factor. The model for a single indicator is given by:

\[ x_i = \lambda_i \xi + \delta_i \]

Table 4.1: List of Model Constructs and Associated Indicators

<table>
<thead>
<tr>
<th>Construct</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHANGE DETERMINATION</strong></td>
<td>X11 Data analysis</td>
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<tr>
<td></td>
<td>X12 Current state assessment</td>
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<tr>
<td></td>
<td>X13 Gap determination</td>
</tr>
<tr>
<td></td>
<td>X14 Stakeholder involvement</td>
</tr>
<tr>
<td></td>
<td>X15 Goal statement</td>
</tr>
<tr>
<td><strong>STRUCTURAL SUPPORT</strong></td>
<td>X21 Resource provision</td>
</tr>
<tr>
<td></td>
<td>X22 Action plan</td>
</tr>
<tr>
<td></td>
<td>X23 Timeline established</td>
</tr>
<tr>
<td></td>
<td>X24 Decision guidelines</td>
</tr>
<tr>
<td></td>
<td>X25 Policy &amp; procedure assessment</td>
</tr>
<tr>
<td><strong>SKILL DEVELOPMENT</strong></td>
<td>X31 Skill determination</td>
</tr>
<tr>
<td></td>
<td>X32 Skill building</td>
</tr>
<tr>
<td></td>
<td>X33 Just in time delivery</td>
</tr>
<tr>
<td></td>
<td>X34 Skill assessment</td>
</tr>
<tr>
<td><strong>PROMOTION</strong></td>
<td>X41 Change necessity communicated</td>
</tr>
<tr>
<td></td>
<td>X42 Exemplary managerial behavior</td>
</tr>
<tr>
<td></td>
<td>X43 Ongoing status reports</td>
</tr>
<tr>
<td><strong>SUCCESS SHARING</strong></td>
<td>X51 Success story effectiveness</td>
</tr>
<tr>
<td></td>
<td>X52 Timing of success sharing</td>
</tr>
<tr>
<td></td>
<td>X53 Management involvement</td>
</tr>
<tr>
<td></td>
<td>X54 Organizational diffusion</td>
</tr>
<tr>
<td><strong>BEHAVIOR MANAGEMENT</strong></td>
<td>X61 Role establishment</td>
</tr>
<tr>
<td></td>
<td>X62 Performance review</td>
</tr>
<tr>
<td></td>
<td>X63 Reward-behavior match</td>
</tr>
<tr>
<td></td>
<td>X64 Management accountability</td>
</tr>
<tr>
<td><strong>CONTROL</strong></td>
<td>X71 Information acquisition</td>
</tr>
<tr>
<td></td>
<td>X72 Corrective action</td>
</tr>
<tr>
<td></td>
<td>X73 Process influence</td>
</tr>
<tr>
<td></td>
<td>X74 Change process review</td>
</tr>
<tr>
<td><strong>CHANGE ACHIEVEMENT</strong></td>
<td>Y81 Business results impact</td>
</tr>
<tr>
<td></td>
<td>Y82 Cost goal attainment</td>
</tr>
<tr>
<td></td>
<td>Y83 On-time attainment</td>
</tr>
<tr>
<td></td>
<td>Y84 Expected behaviors achieved</td>
</tr>
<tr>
<td></td>
<td>Y85 Satisfaction with change results</td>
</tr>
<tr>
<td></td>
<td>Y86 Satisfaction with change process</td>
</tr>
</tbody>
</table>
where $x_i$ is the $i$th indicator from the set of indicators representing a single factor $\xi$, $\lambda_i$ is the corresponding factor loading, and $\delta_i$ is the regression residual. The correlation between indicators of the same construct defines the degree of internal consistency of a measurement scale. The correlation between two indicators $i$ and $j$ of the same construct $\xi$ is described by the product rule for internal consistency:

$$\rho_{ij} = \rho_i \rho_j$$

The correlation between indicators of different constructs defines the degree of external consistency of a measurement scale. The correlation between two indicators $i$ and $p$, where $p$ is an indicator of another construct $\xi^*$, is described by the product rule for external consistency:

$$\rho_{ip} = \rho_i \rho_p \rho_p$$

Gerbing and Anderson (1988) noted that when $\xi$ is the same as $\xi^*$, internal consistency represents a special case of external consistency. This suggests that indicators from other scales provide a means for evaluating the unidimensionality of items that define a given scale. By using the obtained parameter estimates and computing the indicator correlations predicted by the model with the product rules for internal and external consistency, CFA permits the evaluation of the measurement model’s goodness of fit according to the similarity of the predicted and actual correlations.

In terms of the actual mechanics of performing EFA and CFA, we found the procedures defined by Hair et al. (1998) to be extremely useful guides. Much of our analytical process has been structured after their general approach to conducting and interpreting factor analyses and structural equation modeling.

We treat the CHANGE PROCESS construct separately from the CHANGE ACHIEVEMENT construct. CHANGE PROCESS represents a set of process variables—organizational activities that when performed at high levels should result in successful change. CHANGE ACHIEVEMENT represents the output construct—essentially a measurement of change.
success. In this section, we separately assess the construct validity of the measurement models that express these two constructs. Once we establish the degree of construct validity present in these two models, we can proceed to evaluate the relationship between the process model and its consequences (criterion-related validity—next section).

4.1.2 Sample

Data were collected from managers of CQM member organizations as part of ongoing CQM efforts to train individuals on how to mobilize change inside their organizations, and as part of consulting projects inside particular organizations. Respondents were asked to complete the questionnaire appearing in Appendix 1. Ninety-six usable responses from individuals representing 36 organizations were obtained. Demographic information of the respondents appears in Table 4.2. Slightly more respondents worked for service organizations than for manufacturing organizations. About 85% of respondents worked for for-profits organizations. Most individuals were from organizations of more than 100 employees; approximately 60% were from organizations of 500 or more employees. All of the respondents were managers. Over 90% were at least middle level managers; almost six of ten were upper-level managers.

Table 4.2: Demographic Information of Survey Respondents

<table>
<thead>
<tr>
<th>Number of individual responses: 96</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of organizations represented: 36</td>
</tr>
<tr>
<td>Primary industrial sector*</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Ownership status*</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Number of employees*</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Management level of respondent*</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*Percent of total individual responses
Each of the respondents was asked to identify a current or recently completed change initiative in their organization, and then to answer the survey questions in relation to that change initiative. A variety of themes were assessed by the respondents, ranging from highly defined projects such as implementing an Enterprise Resource Planning System (ERP) or a new product roll-out to abstract initiatives such as developing a new mission and vision statement or implementing a TQM culture in the organization. A list of representative changes evaluated by respondents appears in Table 4.3.

Respondents were also asked to provide some estimates on the change’s current progress and its impact on the organization once completed (bottom of Table 4.3). About 55% of the changes were less than half way complete while 45% of the changes were at least fifty percent completed. The scope of the changes was fairly uniform in distribution in terms of the change’s impact across the organization—i.e., some changes were perceived as narrow in scope while others were perceived to influence the organization more broadly (bottom of Table 4.3).

4.1.3 CHANGE PROCESS measurement model

4.1.3.1 Exploratory factor analysis

Design Considerations

The CHANGE PROCESS model consisted of 29 indicators of seven latent constructs (see Table 1). Descriptive statistics of the 29 variables appear in Table 4.4. Higher mean scores are evident for some constructs (such as CHANGE DETERMINATION and STRUCTURAL SUPPORT) than for the indicators representing other constructs (such as BEHAVIOR MANAGEMENT and CONTROL).

The sample size of 96 results in a 3.3 to 1 ratio of observations to variables which is significantly lower than the general rule of having at least five times as many observations as there are variables to analyze (Stevens 1986, Hair et al. 1998).
Table 4.3: Representative Changes Assessed by Survey Respondents

Reengineering of district leadership team & reaffirmation of its mission.
New safety program installation.
Implementation of a high performance work team structure.
Trying to formalize & manage employee activity.
Corporate restructuring.
Evaluating the organization’s strategic position and readiness.
Creating a predictive maintenance service.
New system for defining & communicating project scope & costs.
Rollout of new product line.
Implementing statistical process control.
Revamp and refocus of cutting team.
Cultural change to create empowered work team with highly focused energy toward continuous improvement.
Standardizing the accounts payable process at one division to match other corporate systems.
Reorganization of marketing department to more effectively utilize personnel and align responsibilities.
Implementing a customer feedback & response process.
Collection and analysis of our global market & our company's share of the global market.
Implementation of an automated fingerprinting and identification system.
Providing sales a set standard product packages to sell from.
Developing and implementing problem solving skills.
Trying to implement a company-wide commitment to quality and continuous improvement.
Customer loyalty team.
Implementing our accountability process for our entire workforce, from front-line to executive.
A new job flow scheduling process.
TQM implementation in the organization.
Implementing a structured 7-step problem solving process.
Implementation of several Oracle Business System applications from a proprietary VAX-based system.
Switch to outsourcing of low volume/high mix printed circuit assemblies.
Development of a new process/procedure for product planning and engineering planning.
Integrated applications training model of customer training.
Out-sourcing PCB assembly process including procurement, assembly and test.
Implementation of TQM & integration into existing culture.
Loan data for large institutions will be changed to loan data for small institutions.
Reduce the % of purchased production deliveries for production material.
Improve on-time delivery from vendors.
Establishing a self-directed work team in the printing and fab department.
Centralize back office accounting systems from 3 strategic business units into a Shared Services Division.
Implementation of fast guaranteed service solution offering.

<table>
<thead>
<tr>
<th>Estimated percent implemented*</th>
<th>0-25%</th>
<th>25-50%</th>
<th>50-75%</th>
<th>75-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>37%</td>
<td>18%</td>
<td>24%</td>
<td>21%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% of organization impacted when complete*</th>
<th>0-20%</th>
<th>20-40%</th>
<th>40-60%</th>
<th>60-80%</th>
<th>80-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21%</td>
<td>23%</td>
<td>18%</td>
<td>13%</td>
<td>24%</td>
</tr>
</tbody>
</table>

* Percent of total individual responses

In EFA, departures from normality, homoscedasticity, and linearity apply to the extent that they diminish the observed correlations. Scatter plots of individual variables and of
summated scales indicated significant correlation among the indicators. Some degree of multicollinearity is in fact desirable, since the objective is to identify interrelated sets of variables (Hair et al. 1998). All relationships appeared linear except for the relationships between the \textit{CONTROL} scale and other variables (a curvilinear relationship existed). The \textit{CONTROL} indicators were transformed using an $\chi^2$ transformation (Hair et al. 1998), which improved linearity. An inspection of the correlation matrix (Appendix 2) found many correlations above .30, which suggested that factor analysis was appropriate. Bartlett’s test for sphericity suggested that the correlation matrix contained significant correlations among the variables ($p=.0000$).

\begin{table}[h]
\centering
\caption{Descriptive Statistics of \textit{CHANGE PROCESS} Indicators}
\begin{tabular}{lrr}
\hline
Variable & Mean & StdDev \\
\hline
X11 & 2.3158 & 1.0444 \\
X12 & 2.5895 & .9396 \\
X13 & 2.5684 & 1.0069 \\
X14 & 2.4737 & 1.3436 \\
X15 & 2.6211 & .9360 \\
X21 & 3.0632 & 1.1091 \\
X22 & 2.7684 & 1.1056 \\
X23 & 2.4421 & 1.2608 \\
X24 & 2.3830 & 1.0787 \\
X25 & 2.0870 & 1.2012 \\
X31 & 2.7234 & 1.0616 \\
X32 & 2.7979 & 1.2144 \\
X33 & 2.6915 & 1.0878 \\
X34 & 2.5106 & 1.2678 \\
X41 & 3.1146 & 1.1596 \\
X42 & 2.8021 & 1.0821 \\
X43 & 2.2316 & .9615 \\
X51 & 2.2903 & 1.0486 \\
X52 & 2.1613 & 1.1257 \\
X53 & 2.3936 & 1.2803 \\
X54 & 2.2796 & .9821 \\
X61 & 2.1383 & .9228 \\
X62 & 1.9894 & 1.2313 \\
X63 & 1.6237 & .9659 \\
X64 & 1.6848 & 1.1946 \\
X71 & 2.7083 & 1.1137 \\
X72 & 2.3229 & 1.2690 \\
X73 & 2.2872 & 1.2583 \\
X74 & 1.7895 & 1.0095 \\
\hline
\end{tabular}
\end{table}

\begin{flushleft}
\textit{Deriving the Factors and Overall Fit Assessment}
\end{flushleft}

The factor solution was derived using principal components analysis. The latent root criterion (eigenvalues greater than or equal to 1.0) was applied as the main criterion for selecting
the number of components to be retained for further analysis. The results in Table 4.5 suggested that seven factors should be retained. This is encouraging, since there are seven theoretical constructs proposed for the *CHANGE PROCESS* model. Approximately 70% of the overall variance is captured by these seven factors. The incremental gains in explained variance begins to decrease considerably after the sixth or seventh factor, suggesting that little is gained by adding factors with eigenvalues of less than 1.0.

Table 4.5: Results for the Extraction of Component Factors

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Total % of Variance</th>
<th>Cumulative %</th>
<th>Extraction Sums of Squared Loadings</th>
<th>Cumulative %</th>
<th>Rotation Sums of Squared Loadings</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td>32.808</td>
<td>9.514</td>
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<td>9.879</td>
<td>42.687</td>
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</table>

The rotated component analysis factor matrix appears in Table 4.6, along with the communalities for each variable, and the inter factor correlations. An oblique rotation was used due to the high amount of correlation between the variables. Inspection of the correlation matrix (Appendix 2) suggests a significant degree of correlation among indicators that were designed to measure different latent constructs. Indeed, over half of the correlations are significant at the .05 level. Theoretically, we should indeed expect that indicators of the *CHANGE PROCESS* constructs, such as *CHANGE DETERMINATION*, *STRUCTURAL SUPPORT*, and *SKILL DEVELOPMENT*, to correlate significantly.

Although oblique rotations are less common than orthogonal rotations (often due to their lack of availability in many statistical software packages), oblique rotations are often more realistic because the underlying dimensions are not assumed to be uncorrelated with each other (Hair et al. 1998). As noted above, theory suggests that the constructs of *CHANGE PROCESS*
are correlated; this premise appears supported by the correlation matrix in Appendix 2. Therefore, an oblique rotation was deemed appropriate.

Table 4.6: Component Analysis Factor Matrix and Communalities

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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Component Correlation Matrix

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<th>4</th>
<th>5</th>
<th>6</th>
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<td>.366</td>
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</tr>
</tbody>
</table>

Although the general factor loading patterns are encouraging, some specific variables appear problematic. The problem categories can be defined as: 1) the variables shares variance with more than one factor (i.e., it loads significantly on more than one factor, and 2) the variable contributes less to the overall factor solution than other variables and has less in common with the other variables in the analysis (low communality). Variable X25 (Policy & procedure
assessment) loaded significantly on a different factor (the CONTROL factor) than STRUCTURAL SUPPORT items. Two PROMOTION variables, X42 (Exemplary managerial behavior) and X43 (ongoing status reports), loaded with the SUCCESS SHARING items (factor 1) as well as on their “home” factor Variables X61 (Role establishment) and X62 (Performance review), while loading only on its “home factor,” exhibited relatively low communality (less than .5). Variable X73 (Process influence), loaded on an additional factor.

There may be some theoretical justification for removing some variables to “purify” the measurement model. For example, X25 (Policy & procedure development) while important to STRUCTURAL SUPPORT can be theoretically associated with other constructs in the CHANGE PROCESS model that address specific policies and procedures. In another example, review of policies and procedures are important to communications and behavior management processes in the change context, similar to the themes of first and second factors in Table 4.6.

The removal of all problematic variables is not easily justified from a theoretical basis. For example, X61 and X62 appear well positioned in the theoretical domain of managing behavior in the context of change management. Removal of these variables seems justifiable only on grounds that the four items designed to reflect the BEHAVIOR MANAGEMENT domain actually fracture into subsets of the domain defined enough to make them theoretically separable. Such an argument may be plausible if one views X61 and X62 as primarily components of the performance review cycle, which is often treated differently both in the literature and in practice than reward and recognition processes (e.g., Prince and Lawler 1986).

Although an oblique factor rotation appears most appropriate to our situation due to the correlation among items and factors, we also performed another EFA using an orthogonal rotation (Varimax) for comparison. We did this because orthogonal rotations are more widely used and the associated analytical procedures are more developed and less controversial than the less common oblique approach (Hair et al, 1998).
The seven-factor *CHANGE PROCESS* model with orthogonal rotation appears in Table 4.7. The same general factor patterns appear as in the oblique rotation—all seven theoretical constructs of the *CHANGE PROCESS* model appear supported. However, the separation of the factors is a bit less clean than in the oblique case. Additional items, such as X14 and X24 load on additional factors. Less separation among factors should be anticipated among the factors in this case, since the orthogonal rotation likely “forces” some clusters of variables into uncorrelated arrangements that may not be representative of the actual relationships.

Table 4.7: Component Analysis Factor Matrix and Communalities
Orthogonal Rotation
(Factor Loadings less than .3 Omitted)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
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**EFA Summary**

Exploratory factor analysis provides a useful early step in assessing a measurement model’s ability to express the underlying theoretical constructs. Overall, the EFA provided some encouraging initial support for the construct validity of the *CHANGE PROCESS* model. Our EFA suggested that seven factors explain the majority of the variance in the *CHANGE PROCESS*
model; these factors correspond closely to the specified theoretical constructs. There is some evidence that \textit{PROMOTION} and \textit{SUCCESS SHARING} may be better expressed as a single \textit{COMMUNICATION} factor. Some other variables may be problematic. For example, X25, X61, and X62 either loaded on an unexpected factor or exhibited low levels of communality with other factors. From a theoretical viewpoint, we might argue that the removal of these items may be justifiable. Other items also displayed some lack of internal consistency, although it is more difficult to theoretically argue for their removal from a theoretical standpoint. At this point, we retain all items, pocket the information obtained from the EFA, and proceed to confirmatory factor analysis.

\subsection*{4.1.3.2 Confirmatory factor analysis}

Hair et al. (1998) proposed three distinct strategies for employing CFA and structural equation modeling. In the confirmatory modeling strategy, the researcher specifies a single model and then employs CFA and structural equation models to evaluate the model’s statistical significance. The competing models strategy pits an estimated model against other models that represent plausible rival hypothetical relationships. The third approach, the model development strategy, is useful in the situation where the underlying theory is not developed enough to support a clear specification of the measurement model initially, and the researcher employs CFA findings to respecify a better model—and perhaps advances theory development.

We pursue primarily a confirmatory strategy. Considerable theory and empirical experience supports the \textit{CHANGE PROCESS} model. We wish to understand the statistical significance of this measurement model—a model that is currently being utilized in the field for diagnostic self-assessment purposes. CFA provides some insight into the liberties that can be taken when interpreting the quantitative results of a self-assessment survey based on the model. For example, are we really evaluating \textit{SKILL DEVELOPMENT} when the third category of the survey is completed? Are some items on the \textit{SKILL DEVELOPMENT} scale representative of
something else? CFA helps us understand the unidimensionality of the measures (Gerbing and Anderson 1988), which, in turn, provides insight about the measurement model’s limitations.

That said, it is difficult to conduct a confirmatory modeling strategy alone—without probing other research issues such as the comparison of the model with plausible rivals, and seeking ways to better understand how the variables may relate when the underlying theory is underdeveloped. This is particularly true in our case, where few studies have documented the quantitative findings of change process measurement models. Although the central constructs of our model garner considerable literature support, many plausible frameworks exist for how these constructs should be organized. For example, Lewin’s (1958) three phases of change, unfreezing-moving-refreezing, suggest a sequential ordering of the CHANGE PROCESS constructs.

Therefore, although a confirmatory approach is our primary objective, we also employ the competing models and model development strategies opportunistically to further our understanding of change process theory and its quantitative expression.

Model Specification Alternatives

The primary model of interest was generated in Chapter 3 (Figure 3.9). This model portrays CHANGE PROCESS as seven correlated, first order factors—each representing one the previously elaborated theoretical constructs. This is a simple specification of CHANGE PROCESS and allows a straightforward assessment of the unidimensionality of the seven constructs proposed for the model.

The simple first order model also provides a basis of comparison for more advanced alternatives. One such alternative appears in Figure 3.10, where CHANGE PROCESS actually becomes part of the model as a second order factor. This model posits that the first-order factors are actually sub dimensions of the broader, more encompassing CHANGE PROCESS construct. The CHANGE PROCESS factor becomes an exogenous construct that, in effect, “causes” the first order factors. CHANGE PROCESS is completely latent and not measurable.
A third plausible model is a path model like the one in Figure 3.11. Here, the seven first order constructs are arranged in a hypothetical causal order. As noted in section 3.4 such a path is plausible based on change theories that suggest a sequential arrangement of implementation activities (e.g., Lewin 1958, Beckhard and Harris 1977, Kotter 1995). To assess the path model, CFA morphs into structural equation modeling (SEM), which commonly employs LISREL software to solve the analytical problem.

Our CFA progresses through this sequence of alternative model configurations in order to best understand how the measurement model best expresses the underlying theory of change process.

*Initial Measurement Model Specification*

Our baseline measurement model as portrayed in Figure 3.9 can be represented simply by a seven-construct model as shown in Table 4.8. The seven constructs are hypothesized to be correlated. Since all of the constructs are exogenous, there is no structural model, and the measurement model constitutes the entire structural equation modeling effort. This situation, where each indicator is assigned to a single construct, is the essence of CFA.

*Input Matrix Type and Model Estimation Approach*

The correlation matrix of the 29 variables was used in the estimation (Appendix 2). LISREL 8 (Joreskog and Sorbom 1993) and SAS were employed to solve the structural equation problems presented by our CFA.

*Goodness-of-Fit Evaluation*

Table 4.9 contains the LISREL estimates for our initial measurement model and the construct correlations. An initial check for offending estimates (Hair et al. 1998) finds no construct loadings exceeding 1.0 and no negative indicator measurement error variances. Thus, the estimated coefficients are within acceptable limits.
Table 4.8: Seven Construct First Order Measurement Model

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<th>SKILL DEVELOPMENT</th>
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Overall Model Fit

a) Absolute Fit

Absolute fit measures reflect the degree to which the overall model predicts the observed correlation matrix (Hair et al. 1998). Popular absolute measures include the chi-square statistic, the goodness-of-fit (GOF) statistic, the root means square error, and the root mean square error of approximation.

The likelihood ratio chi-square ($\chi^2$) is the most fundamental measure of overall fit. A large value of chi-square relative to the degrees of freedom signifies that the observed and estimated matrices differ considerably (an undesirable result). Low chi-square values, where $p$ is greater than .01 or .05, indicate that the actual and predicted input matrices are not significantly different. A drawback to the chi-square measure is that it is sensitive to sample size—as sample
increases, the measure tends to indicate significant differences for equivalent models. The chi-square measure has also been found sensitive to the number of scale categories in the CFA model (Green et al. 1997). The chi-square value for our initial model was 610.84 with 356 degrees of freedom, with a highly significant p-value of 0.00. This suggests that the model is not well fitted, since the actual and predicted correlation matrices are statistically different.

The goodness-of-fit index, or GFI, (Joreskog and Sorbom 1993) is a widely used measure provided by LISREL. A non-statistical measure (0 = poor fit and 1.0 = perfect fit), the GFI represents the squared residuals compared to the actual data and is not adjusted to the degrees of freedom. Higher values indicate a better fit, but no threshold level for acceptability has been established. The GFI for our initial model was 0.72.

The root mean square residual (RMSR) is the square root of the mean of the squared residuals observed between the observed and estimated correlation matrices. No threshold level has been established. The RMSR for our model was .093.

The root mean square error of approximation (RMSEA) attempts to correct for the sensitivity of the chi-squared measure to large sample sizes (Hair et al. 1998). It differs from the RMSR in that the discrepancy is measured in terms of the population, not just the sample used for estimation (Steiger 1990). Values between .05 and .08 have been proposed as desirable, particularly for confirmatory or competing model CFA strategies with larger samples (Rigdon 1986). The RMSEA for our initial model was .087—slightly above the desirable level.

b) Incremental Fit

Incremental fit measures compare the proposed model to a “null” model—some realistic baseline model that all other models should be expected to exceed. In most cases, the null model is a single-construct model with all indicators perfectly measuring the construct (Hair et al. 1998). Three often-cited measures of incremental fit are the adjusted goodness-of-fit index, the non-normed fit index, and the normed fit index.
Table 4.9: CFA Results for the Initial Model

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Table 4.9 (cont’d) Correlations Among Latent Constructs (t-value in parenthesis)

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<td>(11.41)</td>
<td>(4.05)</td>
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<td>(5.74)</td>
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<td>(5.35)</td>
<td>(4.21)</td>
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<td>(4.43)</td>
<td>(8.30)</td>
<td>(5.35)</td>
<td>(4.21)</td>
<td>(5.43)</td>
<td></td>
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</tr>
</tbody>
</table>

The adjusted goodness-of-fit index (AGFI) is an extension of the GFI adjusted by the ratio of the degrees of freedom of the proposed model to the null model. Levels of .85 and above have been deemed desirable. The AGFI for our initial model, .66, is much lower than the benchmark.

The non-normed fit index (NNFI), also known as the Tucker-Lewis Index, combines a measure of parsimony into a comparative index between the proposed and null models, resulting in values from 0 to 1.0. A recommended value is .90 or higher. The NNFI for our initial model was .80.

The normed fit index (NFI) is another comparison of the chi-squared statistic of the proposed to the null model. A commonly recommended value is .9. The NFI for our initial model was .67.

c) Parsimonious Fit

Parsimonious fit measures relate the model’s fit to the number of estimated coefficients required to achieve the fit (Hair et al. 1998). Since no statistical test is available for these measures, their usefulness is limited mostly to comparisons between models. Two common measures of parsimonious fit are the parsimonious normed fit index and the parsimonious goodness-of-fit index.
The parsimonious normed fit index (PNFI) modifies the NFI to account for the degrees of freedom. Higher values are better, and differences of .06 to .09 are proposed indicative of substantial differences between models (Williams and Holahan 1994). The PNFI for our initial model was .59.

The parsimonious goodness-of-fit index (PGFI) modifies the GFI to include the number of indicators in the model. Higher values indicate better model parsimony. The PGFI for our initial model was 0.59.

In summary, the measures of overall fit suggest that our initial first order seven-factor model with all 29 indicators provides a less-than-conventionally-acceptable representation of the proposed theoretical constructs in terms of the indicators’ external consistency—the ability to reflect a single intended construct well.

**Measurement Model Fit**

Although the overall fit analysis produced some less-than-acceptable findings, we proceed to evaluate the indicator loadings for significance and the construct’s reliability. First, for each variable in Table 4.9, the high t-values (the critical value is 2.56) suggest that all variables are significantly related to their constructs. It is interesting, however, that loadings associated with X25, X61, and X62 are among the lowest of the group—a finding consistent with the weakness suggested by our EFA above.

We also examine the standardized residuals for outliers. A model with poor fit should have a large number of high-valued residuals. Standardized residuals greater than 2.58 should be considered significant. Thirty standardized residuals (almost 7% of the total) exceeded the 2.58 threshold. We should expect about 1 in 20 to exceed the threshold by random chance alone under the condition of normality.

Another principal measure used in assessing measurement model fit is the reliability of each construct. Reliability reflects the internal consistency of each construct, or the degree to which the intended indicators of the construct relate to each other. As noted by Gerbing and
Anderson (1988) among others, reliability is of secondary importance to the issue of unidimensionality. Reliability pertains to the internal agreement among indicators of a construct—it does not address the critical issue of whether the indicators measure only the intended construct and not others (external consistency). Nonetheless, measurement scales must be reliable—measurement error should be minimized.

<table>
<thead>
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<th>Construct</th>
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<td>CHANGE DETERMINATION</td>
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</tr>
<tr>
<td>STRUCTURAL SUPPORT</td>
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</tr>
<tr>
<td>SKILL DEVELOPMENT</td>
<td>.854</td>
</tr>
<tr>
<td>PROMOTION</td>
<td>.780</td>
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<td>SUCCESS SHARING</td>
<td>.885</td>
</tr>
<tr>
<td>BEHAVIOR MANAGEMENT</td>
<td>.682</td>
</tr>
<tr>
<td>CONTROL</td>
<td>.817</td>
</tr>
</tbody>
</table>

The most popular measure of construct reliability is Cronbach’s alpha. Table 4.10 portrays Cronbach’s (1951) alpha for the seven constructs of our initial measurement model. Six of the 7 CHANGE PROCESS constructs exceed the .7 threshold conventionally viewed as a minimum acceptable level of construct reliability. The reliability of BEHAVIOR MANAGEMENT appears marginal, as indicated by the alpha of .682. This is consistent with our earlier findings suggesting the low inter-item correlation between the indicators of this construct. Overall, though, the scales of CHANGE PROCESS exhibit considerable reliability.

However, reliability does not ensure validity. Construct validity relates the measures’ unidimensionality (McDonald 1981, Hattie 1985, Gerbing and Anderson 1988). A researcher may mistakenly assume that a measure indicates one construct when in fact the indicators measure something else. This is the essence of external consistency. A review of the construct correlation matrix (bottom of Table 4.9) suggests a high degree of correlation among the proposed constructs—i.e., a low level of external consistency. Most of the correlations are significant at the .01 level. It is the sensitivity of CFA to multicollinearity that allows the CFA method to discriminate between measures that are internally consistent (significant relationship
between indicators of the same construct) and those that are externally consistent (the measures relate ONLY to the intended construct and not to other unintended constructs).

Large correlations between constructs suggest a possible reformulation of the causal relationships between constructs. Hair et al (1998) suggested that correlations exceeding .80 can be problematic. Although the inter-construct correlations in Table 4.9 do not exceed this .80 threshold, the high degree of relationship between the constructs in the CHANGE PROCESS model suggest a low level of external consistency between the seven first order CHANGE PROCESS constructs.

Alternative Models

As noted above, the objective of our CFA evaluation is primarily confirmatory—we wish to evaluate the construct validity of the CHANGE PROCESS model as theorized. Our findings suggest that the seven construct, 29-indicator CHANGE PROCESS measurement model contains reliable constructs (acceptable internal consistency) but only a moderate degree of unidimensionality (questionable external consistency). A contributing factor to our problem is that our sample to variable ratio is below the five-to-one ratio often cited as a minimum threshold. A low ratio leads to “over-fitting the data” (Hair et al. 1998), meaning that the factors derived tend to be sample-specific with little generalizability. The findings obtained from lower sample sizes must be carefully interpreted.

One means to reduce over-fitting is to reduce the number of variables in the model to obtain more parsimony. Variables should not be removed haphazardly, however. Only variables that are found to be theoretically or technically inferior should be removed. Theoretically, a variable might be removed if it is found to occupy different theoretical ground in the construct’s theoretical domain. For example, we suggested in the EFA analysis earlier that X61 and X62 might be viewed as a separate subset of BEHAVIOR MANAGEMENT that addresses the performance review process—possibly different theoretical space than the other two variables. Other variables that may fit this category include X54 which deals with diffusing learned lessons
throughout the organization (as part of a construct meant to communicate successes) and X74 that addresses process review and improvement (as part of a construct meant to embody change control).

A variable might also be a candidate for removal if it can be shown that the variable actually overlaps more than one of the model’s theoretical domains. As we noted in our EFA earlier, X25 might be such a candidate, since review of policies and procedures can conceivably fall under more than one construct of the CHANGE PROCESS model. In effect, the argument is one of “theoretical unidimensionality.” The most effective indicators in a measurement model are those that reflect the theoretical domain of the intended construct but not others.

The third justification for removing a variable is technical in nature rather than theoretical. Poor wording or some other problem with the question might reduce precision or perhaps cause the item to be misinterpreted. Pre-investigation scrubbing of the items and beta tests of the instrument, which were both done prior to this study (see Chapter 3), help reduce these technical problems. However, the problems are rarely eliminated. Indeed, it is common in published investigations to cite some type of technical concession (such as poor wording) to justify the removal of some items from the model during analysis (see for example, Kohli, Jaworski, and Kumar 1993).

With these criteria in mind, we tried some alternative model configurations to investigate how fit might be improved. The alternative models were based on findings from our EFA work above, the findings from each of the CFA model runs described below, and our understanding of the relationship of each CHANGE PROCESS variable to the theoretical domains of the seven representative constructs of CHANGE PROCESS. The following first-order models were specified and subjected to CFA:

M0: Null model; single factor model with no measurement error; all 29 variables in (baseline model).

Configurations with 7 first order factors:
M1: Initial model discussed above; all 29 variables included.
M2: 26 variables in; X25 X61 X74 out.
M3: 22 variables in; X15 X24 X25 X41 X54 X61 X74 out. 
M4: 18 variables in; X14 X15 X21 X24 X25 X34 X41 X54 X61 X62 X74 out. 
M5: 16 variables in; X14 X15 X21 X24 X25 X34 X41 X53 X54 X61 X62 X71 X74 out. 

Configurations with 6 first order factors: 
M6: PROMOTION and SUCCESS SHARING items linked to same factor; 21 variables; X15 X24 X25 X41 X42 X54 X61 X74 out. 
M7: PROMOTION and SUCCESS SHARING items linked to same factor; 15 variables; X14 X15 X21 X24 X41 X42 X53 X54 X61 X62 X71 X74 out. 

Configurations with 5 first order factors: 
M8: All PROMOTION and SUCCESS SHARING items removed; 10 variables; X12 X14 X15 X21 X24 X25 X33 X34 X41 X42 X43 X51 X52 X53 X54 X63 X64 X71 X74 out. 

Fit statistics for the alternative model analysis appear in Table 4.11. The results indicate that we can dramatically improve the fit of the CHANGE PROCESS model by eliminating indicators that display a theoretical or technical deficiency. The best fitting seven-factor model was M5, a 16 variable model that included at least two indicators per construct. This model produced a non significant chi-square (p=.022) and other fit measures that approached or exceeded technical benchmarks (GFI=.88, RMSR=.061, NNFI=.94). 

Table 4.11: CFA Results of Alternative CHANGE PROCESS Models 

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<tr>
<th>Model</th>
<th>χ²</th>
<th>Df</th>
<th>P-value</th>
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<th>RMSR</th>
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<th>AGFI</th>
<th>NNFI</th>
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<td>.84</td>
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In models M6 and M7, we reduced the number of factors by combining the items from PROMOTION and SUCCESS SHARING into a single “COMMUNICATIONS” construct—something that we proposed theoretically plausible in Chapter 3. Measures of fit for M6 and M7 were slightly inferior to the seven factor configurations with a comparable number of variables,
suggesting that combining \textit{PROMOTION} and \textit{SUCCESS SHARING} into a single construct holds little advantage. In M8, we investigated the effects of eliminating the \textit{PROMOTION} and \textit{SUCCESS SHARING} items entirely, to evaluate \textit{CHANGE PROCESS} in a highly parsimonious 10 variable five-factor configuration. Of all configurations, this model displayed the best technical fit. The ratio of variables to cases in this model also approaches the desirable ten-to-one ratio (Hair et al. 1998). However, we have certainly pushed the theoretical limit by eliminating a large number of variables for the sake of parsimony.

We also fitted some second order models that represented the \textit{CHANGE PROCESS} configuration proposed by Figure 3.10:

M9: Second order factor “causing” 7 first order factors (Fig. 3.10); all 29 indicators.  
M10: Second order factor “causing” 7 first order factors (Fig. 3.10); X15 X24 X25 X41 X54 X61 X74 out.

The second order factor models fit less well than comparable first order configurations (Table 4.11). Although it is generally accepted that second order models are more difficult to fit, we infer from our findings that the best way to view the \textit{CHANGE PROCESS} model is as a combination of correlated first order constructs as suggested by Figure 3.9.

We also attempted some path models with the change process constructs arranged to imply causal order, similar to the configuration proposed in Figure 3.11. However, we could not get these configurations through LISREL due to the “not positive definite” problem with the fitted covariance matrices. This problem frequently suggests misspecification. We suggest that the high degree of multicollinearity between many of the factors renders the path model problem intractable for our current data set.

It is also possible that a path model such as Figure 3.11 may not be empirically correct. We showed a number of managers who were familiar with the content of the CQM change model conceptual diagrams similar to Figures 3.9 and 3.11 and asked them to select the one that “rang true” with them. Other managers were provided Post-It notes with the 7 categories written on them and asked to arrange the cards in the order they thought most representative of the change.
process. Every manager we asked chose the model represented by Figure 3.9. When asked why, their comments included:

“We do these activities in parallel, not in sequence.”
“We don’t necessarily do these activities in any particular order.”
“For some changes, certain categories matter more than others.”

Although the evidence here is anecdotal, the notion that change process is perhaps best expressed as a group of activities done in parallel with no particular causal order is a significant one theoretically—one that merits further investigation.

**Summary**

Our analysis of the *CHANGE PROCESS* measurement model produced mixed findings with regards to construct validity. Findings from the EFA, such as the seven factor pattern matrices, significant loadings on latent factors that generally matched those predicted by theory, and decent communalities suggested significant levels of internal consistency among the indicators and their designated constructs. Subsequent CFA findings, such as the significant factors loadings and the high factor reliabilities reinforced this assessment of internal consistency.

However, the *CHANGE PROCESS* model demonstrated only mediocre degrees of external consistency. Fit statistics from the CFA were significantly below the desirable thresholds suggested in the literature. The problem is exacerbated by the high degree of multicollinearity between indicators and constructs. Although some correlation is desirable to establish relationships, excessive correlation between indicators of different constructs suggests that the indicators are not unidimensional—they measure more than one thing. This detracts from the model’s unidimensionality and helps define the limitations with which the model can be accurately employed as a measurement instrument.

It is possible to improve the fit of the *CHANGE PROCESS* model by reducing the number of indicators. When the number of indicators is reduced from the initial set of 29 to twenty or less, measures of fit for the *CHANGE PROCESS* model approach commonly accepted
thresholds for adequate model fit. The improvement in technical characteristics, of course, is obtained by sacrificing some content validity.

4.1.4 *CHANGE ACHIEVEMENT* measurement model

4.1.4.1 Exploratory factor analysis

*Design considerations*

*CHANGE ACHIEVEMENT* represents the output construct of the CQM change process model. Descriptive statistics of the 6-item scale appear in Table 4.12.

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<th>Variable</th>
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<th>StdDev</th>
</tr>
</thead>
<tbody>
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</tr>
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</tr>
<tr>
<td>Y85</td>
<td>2.0319</td>
<td>1.2044</td>
</tr>
<tr>
<td>Y86</td>
<td>2.0753</td>
<td>1.1909</td>
</tr>
</tbody>
</table>

Note that the mean scores in Table 4.13 are lower than most of the means in Table 4.4, suggested that *CHANGE ACHIEVEMENT* was rated lower that most *CHANGE PROCESS* variables by the survey respondents. Also note that Y82, a variable that assesses cost outcomes related to the change, appears to have a lower mean than the other variables in the set.

A close review of the inter-item correlations (Table 4.13) suggests that the strength of the relationships between indicators varies considerably. In particular, Y82 and Y83 appear to correlate relatively weakly to other scale items. Low inter item correlations hint at low internal consistency among indicators of the same factor.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Y81</th>
<th>Y82</th>
<th>Y83</th>
<th>Y84</th>
<th>Y85</th>
<th>Y86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y81</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y82</td>
<td><strong>.417</strong></td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y83</td>
<td>.177</td>
<td>.159</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y84</td>
<td><strong>.617</strong></td>
<td><strong>.280</strong></td>
<td>.229</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y85</td>
<td><strong>.545</strong></td>
<td>.170</td>
<td><strong>.413</strong></td>
<td><strong>.325</strong></td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Y86</td>
<td><strong>.298</strong></td>
<td>.021</td>
<td>.185</td>
<td>.185</td>
<td><strong>.521</strong></td>
<td>1.000</td>
</tr>
</tbody>
</table>

** p < .01

Table 4.13: Correlations Between *CHANGE ACHIEVEMENT* Indicators
Deriving the Factors and Overall Fit Assessment

The factor solution was derived using principle components analysis with an oblique rotation. Although only one factor is proposed, we assume that a multiple factor model would contain correlated factors.

The latent root criterion (eigenvalues greater than or equal to 1.0) was applied as the main criterion for selecting the number of components to be retained for further analysis. The results in Table 4.14 suggested that two factors should be retained. These two factors explained a relatively low 62% of the variance.

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
<td>Cumulative</td>
</tr>
<tr>
<td>1</td>
<td>2.579</td>
<td>42.983</td>
<td>42.983</td>
</tr>
<tr>
<td>2</td>
<td>1.127</td>
<td>18.784</td>
<td>61.767</td>
</tr>
<tr>
<td>3</td>
<td>.920</td>
<td>15.328</td>
<td>77.095</td>
</tr>
<tr>
<td>4</td>
<td>.694</td>
<td>11.569</td>
<td>88.664</td>
</tr>
<tr>
<td>5</td>
<td>.433</td>
<td>7.224</td>
<td>95.888</td>
</tr>
<tr>
<td>6</td>
<td>.247</td>
<td>4.112</td>
<td>100.000</td>
</tr>
</tbody>
</table>

The rotated component analysis factor matrix appears in Table 4.15, along with the communalities for each variable. The factor loadings and communalities suggest a number of problems. Y81 loads significantly on both factors. Communality of Y82 is particularly low. The patterns on neither factor are intuitive. Y82 appears to be a candidate for removal. We previously noted the low correlations of both Y82 and Y83 with other CHANGE ACHIEVEMENT indicators in Table 4.13. Y82 is intended to reflect the achievement of cost objectives associated with the change, and Y83 is supposed to reflect the degree to which the change’s implementation was on-schedule. Cost and time outcomes are classic objectives of project management (e.g., Grundy 1998).
Table 4.15: Initial Component Analysis Factor Matrix for CHANGE ACHIEVEMENT
Oblique Rotation
(Factor Loadings less than .3 Omitted)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y81</td>
<td>.339</td>
<td>.703</td>
<td>.744</td>
</tr>
<tr>
<td>Y82</td>
<td>.832</td>
<td>.637</td>
<td></td>
</tr>
<tr>
<td>Y83</td>
<td>.396</td>
<td>.247</td>
<td></td>
</tr>
<tr>
<td>Y84</td>
<td>.700</td>
<td>.598</td>
<td></td>
</tr>
<tr>
<td>Y85</td>
<td>.827</td>
<td>.782</td>
<td></td>
</tr>
<tr>
<td>Y86</td>
<td>.870</td>
<td>.699</td>
<td></td>
</tr>
</tbody>
</table>

However, such “hard” measures are lacking from many organizational change initiatives (Troy 1994). In some cases, cost and time may not be considered key success factors; Nadler and Tushman’s (1989) insights on the complexities associated with large scale change suggest that cost and time goals may be unrealistic and immeasurable. Empirical remarks from some practitioners support these assertions. For example, the CQO of an architect/design firm that participated in the study noted that cost was not an important measure of success in most of her company’s change initiatives. Changes in her firm were usually evaluated against criteria that reflected the firm’s core values—which related to customer service and satisfaction.

Table 4.16: Results of Second Extraction of Component Factors for CHANGE ACHIEVEMENT

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total % of Variance</td>
<td>Cumulative %</td>
</tr>
<tr>
<td>1</td>
<td>2.266</td>
<td>56.661</td>
</tr>
<tr>
<td>2</td>
<td>.947</td>
<td>23.687</td>
</tr>
<tr>
<td>3</td>
<td>.477</td>
<td>11.914</td>
</tr>
<tr>
<td>4</td>
<td>.310</td>
<td>7.739</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Extraction Sums of Squared Loadings</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.266</td>
<td>56.661</td>
</tr>
<tr>
<td>2</td>
<td>.947</td>
<td>80.347</td>
</tr>
<tr>
<td>3</td>
<td>.477</td>
<td>92.261</td>
</tr>
<tr>
<td>4</td>
<td>.310</td>
<td>100.000</td>
</tr>
</tbody>
</table>

Using this blend of theoretical, empirical, and statistical evidence, we removed both Y82 and Y83 and performed another EFA using the remaining 4 indicators. One principal component was extracted based on the latent root criterion (Table 4.16); the single factor only explained about 57% of the variance.
The indicator loadings and communalities for the 4-indicator model appear in Table 4.17. The loadings are significantly improved. However, two indicators, Y84 (a measure of the degree to which behavior is observed as supporting the change initiative) and Y86 (a measure of satisfaction with the way the change was implemented), exhibited relatively low communalities, suggesting the two variables contribute less to the overall factor solution than Y81 and Y85.

Therefore, an additional EFA was conducted with Y86 removed. The single factor suggested by the latent root criteria extracted 67% of the variance—a considerable improvement over the 4-indicator model. The component factor matrix (Table 4.18) finds high factor loadings with improved communalities.

Table 4.18: Third Component Analysis Factor Matrix for CHANGE ACHIEVEMENT
(Factor Loadings less than .3 Omitted)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Loadings</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y81</td>
<td>.898</td>
<td>.807</td>
</tr>
<tr>
<td>Y84</td>
<td>.797</td>
<td>.635</td>
</tr>
<tr>
<td>Y85</td>
<td>.748</td>
<td>.560</td>
</tr>
</tbody>
</table>

EFA Summary

The original CHANGE ACHIEVEMENT scale composed of six indicators exhibited a low degree of internal consistency. An argument for the removal of at least two items can be made. A three item scale appears to exhibit decent internal consistency. Those items, Y81, Y84, and Y85 all represent measures that are not directly tied to quantitative measures of change achievement. They represent a scale with greater psychometric character, since the indicators...
reflect the respondent’s perception of the change’s results at both the organization and individual level.

4.1.4.2 Confirmatory factor analysis

Measurement model specification

The measurement model specification for CHANGE ACHIEVEMENT is much simpler than the specification for the CHANGE PROCESS measurement model. The original 6 indicators are all hypothesized to load on a single latent factor. A few comparative models were run:

M0: Null model; single factor model with no measurement error; all 6 indicators.
M1: One first order factor; all 6 indicators
M2: One first order factor; Y82 and Y83 out.
M3: One first order factor, Y82, Y83, Y86 out; indicator error terms fixed using estimates from M2.

Our EFA above suggested low internal consistency with the 6 indicator original model. Y82, Y83, and Y86 were candidates for removal. A problem with fitting single factor models with a low number of indicators is that precious degrees of freedom are lost, making fit difficult to accurately assess. M3 was included as a provisional model where the indicator error terms were fixed using the estimates from M2 (fixing the error terms reduces the number of parameters to be estimated and increases degrees of freedom). The fit estimates should be considered highly provisional; they are included to provide some insight about the model’s fit with only three indicators.

Overall Model Fit

Results of the fit analysis of these models appear in Table 4.19. The initial 6-indicator model M1 exhibits marginal fit as suggested by our EFA above. M2, with Y82 and Y83 removed, exhibits no significant improvement—indeed, with 2 degrees of freedom, many of the adjusted fit statistics are actually poorer than M1. M3, which incorporates fixed error terms estimated from M2, exhibit significantly better fit characteristics, with most of the fit measures exceeding accepted thresholds.
Table 4.19: CFA Results of Alternative CHANGE ACHIEVEMENT Models

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>P-value</th>
<th>GFI</th>
<th>RMSR</th>
<th>RMSEA</th>
<th>AGFI</th>
<th>NNFI</th>
<th>NFI</th>
<th>PNFI</th>
<th>PGFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>M0</td>
<td>153</td>
<td>15</td>
<td>0.0</td>
<td>.63</td>
<td>.29</td>
<td>.31</td>
<td>.48</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>M1</td>
<td>40.6</td>
<td>9</td>
<td>.000006</td>
<td>.89</td>
<td>.095</td>
<td>.19</td>
<td>.74</td>
<td>.62</td>
<td>.74</td>
<td>.44</td>
<td>.38</td>
</tr>
<tr>
<td>M2</td>
<td>19.0</td>
<td>2</td>
<td>.000075</td>
<td>.91</td>
<td>.096</td>
<td>.30</td>
<td>.56</td>
<td>.51</td>
<td>.83</td>
<td>.28</td>
<td>.18</td>
</tr>
<tr>
<td>M3</td>
<td>1.76</td>
<td>3</td>
<td>.62</td>
<td>.99</td>
<td>.031</td>
<td>0.0</td>
<td>.98</td>
<td>1.02</td>
<td>.98</td>
<td>.98</td>
<td>.49</td>
</tr>
</tbody>
</table>

**Measurement Model Fit**

The patterns and values of the fitted residuals indicated no serious concerns. Cronbach’s alpha for the original six-item scale was .71. Reliability increased to .74 with Y82 and Y83 removed. It increased slightly to .75 with Y86 removed as well.

**4.1.5 Assessment of construct validity**

In this section we analyzed the measurement models that express the latent constructs of CHANGE PROCESS and CHANGE ACHIEVEMENT. Factor analysis and structural equation modeling permitted insight into the internal consistency (reliability) and external consistency (unidimensionality) of the measurement models.

The seven-construct model of CHANGE PROCESS was found to be internally consistent. Factor loadings and reliability measures were significant, suggesting a high degree of reliability. Internal consistency improved with the removal of weak indicators. Besides the fact that these indicators did not exhibit strong measurement properties, the removal of many of these indicators appeared theoretically justified on the grounds that they reflect a significantly different portion of the latent construct’s theoretical domain than the remaining items.

High internal consistency, however, does not ensure unidimensionality (Gerbing and Anderson 1988). Confirmatory factor analysis suggested that the 29-item CHANGE PROCESS measurement model possessed mediocre external consistency. Overall fit statistics fell short of accepted thresholds. Much of the problem appears related to a high level of multicollinearity among the indicators. It is also well known that fit gets more difficult as the number of constructs increase (Hair et al. 1998). A number of widely cited, multi-construct measurement models have
fit characteristics not unlike the CHANGE PROCESS model. For example, Kohli, Jaworski, and Kumar (1993) presented fit measures for their MARKOR model of market orientation that were similar to those obtained in this evaluation.

When items are removed from the original 29-indicator CHANGE PROCESS model, the technical fit improves (Table 4.11). As the number of variables approaches 20 or less, the measures of fit approach commonly accepted research benchmarks. The caveat, of course, is a loss of content validity for sake of construct validity. A more parsimonious model does help us overcome a severe limitation: small sample size. By reducing the number of variables, we increase of ratio of samples-to-variables deemed necessary to avoid over fitting the model (Hair et al. 1998).

The original 6 item CHANGE ACHIEVEMENT scale exhibited low internal consistency. Acceptable factor patterns and reliabilities required the elimination of 2-3 indicators from the scale. This seems acceptable from a theoretical standpoint, since the removed items reflected quantitative measures such as cost and time goal realization. The remaining indicators share psychometric character—the items reflect individual perceptions of change achievement rather than quantitative measures of the change. The external consistency of the reduced item scale is difficult to assess, since precious degrees of freedom are lost when indicators are removed. A provisional model where some parameters were fixed to boost degrees of freedom suggested that the reduced scale approaches acceptable fit. A review of the inter-item correlation matrix (Table 4.13) suggests that Y81, Y84, and Y85 are the strongest indicators of CHANGE ACHIEVEMENT based on their relationships to each other.

A final remark here relates to the appropriateness of conventional academic benchmarks for construct validity when evaluating a model to be used in empirical self-assessment. In this study, we have investigated a measurement model that differed in at least two ways from most models evaluated in the literature. First, the CQM model was developed empirically and induced primarily from data grounded in experience. Many academic models are developed logically by
deducing the model from previous theory. Second, the CQM model was developed for managerial use in a self-assessment mode. Many academic measurement models are used to confirm constructs and relationships deduced from conceptual theory and are rarely employed by practitioners.

As we view this model in the self-assessment context, a salient issue concerns the standards for evaluating measurement model validity for self-assessment as compared to the standards for pure research-based models. While high levels of construct validity (defined as exceptional unidimensionality) may be important for academic research, instruments for empirical self-assessment may have different minimum requirements. Why? One reason may be that many organizational constructs that are of practical interest are unavoidably multidimensional and highly intertwined. For example, scholars frequently cite difficulty with isolating processes for determining large-scale organizational change from activities for restructuring the organization to receive the change (e.g., Lindblom 1959, Mintzberg 1976). The nature of the organization as a system of complex, interactive systems (Churchman 1968, Ackoff 1970) makes it difficult to generate constructs of organizational activities that are not significantly correlated.

Another reason may be that the level of construct validity required for diagnosing organizational problems may be less than the level needed for many academic research problems. In our field research we have observed situations where the CQM measurement model provided effective diagnostic guidance about deficient CHANGE PROCESS categories that, upon reflection by the organization’s managers, revealed an obvious area requiring remedial action. Some field examples that we witnessed appear in Table 4.20.

In each of these situations, the indicators and their constructs were able to discriminate a problematic area from non-problematic areas, suggesting that the model’s construct validity may be “good enough.”
Table 4.20: Examples of Low-Scoring Survey Category and Actual Change Process Problems

<table>
<thead>
<tr>
<th>Low-Scoring Construct During Self-Assessment</th>
<th>Organizational Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRUCTURAL SUPPORT</td>
<td>No action plans or timelines generated to support the change objective had been generated.</td>
</tr>
<tr>
<td>CONTROL</td>
<td>No system was installed to monitor the change’s implementation.</td>
</tr>
<tr>
<td>CHANGE DETERMINATION</td>
<td>The goal of the change was never clearly stated.</td>
</tr>
</tbody>
</table>

4.2 Criterion-Related Validity

An important component of validity for a model to be used in organizational self-assessment is its predictive ability. After all, a self-assessment based on a model that does not connect a change in organizational activities to a change in results would be pointless to many managers. Indeed, Nadler (1980a) noted that most models used in organizational assessments usually couple variables that represent behavioral processes or activities with an organizational outcome or result variable. In the CQM model, the seven construct CHANGE PROCESS model is conceptually linked to the outcomes construct of CHANGE ACHIEVEMENT.

Assessing the relationship between CHANGE PROCESS and CHANGE ACHIEVEMENT helps us understand a model’s criterion-related validity. A model holds criterion-related validity when it can predict, or correlate with, an outside variable of interest.

We employ three approaches to evaluate the relationship between CHANGE PROCESS and CHANGE ACHIEVEMENT, all of them quantitative. Simple and multiple regression provides a familiar approach to assessing the strength of the relationship between independent and dependent variables. Our data set also allows us to utilize canonical correlation analysis to understand the strength and patterns among individual indicators in the CQM model. Finally, we estimate a path model utilizing the first order seven-factor model evaluated in the previous section on construct validity.
4.2.1 Simple regression

Data

Our data set stems from the same respondent survey group described in the previous section (see section 4.1.2). However, here we combine the individual indicators for each construct into a summated scale by calculating the average score of the indicators. For example, if a respondent recorded the following scores for the indicators under SKILL DEVELOPMENT: \( x_{31} = 3, x_{32} = 2, x_{33} = 3, x_{34} = 3 \), then the summed (average) score for PROMOTION for that individual would be \( (3+2+3+3)/4=2.75 \).

Summated scales provide two benefits. First, summated scales reduce measurement error by using multiple indicators to reduce the reliance on a single response; by using the average or “typical” response to a set of related indicators, the measurement error that might occur in a single question is reduced (Hair et al. 1998).

The second benefit is that summated scales help represent the multiple aspects of a complex concept that typify many organizational constructs. Multi-faceted constructs are often difficult to evaluate using factor analysis if indicators represent different enough spaces of the latent variable’s theoretical domain. In the previous section, constructs such as BEHAVIOR MANAGEMENT did not fare well in factor analysis—perhaps because the indicators, while related to the same general theory, were different enough to elicit a heterogeneous response from the survey subjects. The summated scale combines the indicators into a single measure representing the commonality among the items.

For our regression analysis, therefore, we calculated each individual’s average response to the questions representing each category of the survey instrument. Table 4.21 summarizes the summated scales and the indicators that they represent. Despite some of the findings in the previous section, we chose to include all indicators in the regression analysis. As noted above, summated scales helps homogenize scales where the indicators are theoretically valid; in Chapter 3 we found evidence to support the content validity of the indicators.
Table 4.21: Summated Scales Used in Regression Analysis

<table>
<thead>
<tr>
<th>Scale Label</th>
<th>Theoretical Construct</th>
<th>Indicators Represented</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>CHANGE DETERMINATION (CD)</td>
<td>x11, x12, x13, x14, x15</td>
</tr>
<tr>
<td>X2</td>
<td>STRUCTURAL SUPPORT (SS)</td>
<td>x21, x22, x23, x24, x25</td>
</tr>
<tr>
<td>X3</td>
<td>SKILL DEVELOPMENT (SD)</td>
<td>x31, x32, x33, x34</td>
</tr>
<tr>
<td>X4</td>
<td>PROMOTION (P)</td>
<td>x41, x42, x43</td>
</tr>
<tr>
<td>X5</td>
<td>SUCCESS SHARING (SH)</td>
<td>x51, x52, x53, x54</td>
</tr>
<tr>
<td>X6</td>
<td>BEHAVIOR MANAGEMENT (BM)</td>
<td>x61, x62, x63, x64</td>
</tr>
<tr>
<td>X7</td>
<td>CONTROL (C)</td>
<td>x71, x72, x73, x74</td>
</tr>
<tr>
<td>X8</td>
<td>CHANGE ACHIEVEMENT (CA)</td>
<td>x81, x82, x83, x84, x85, x86</td>
</tr>
</tbody>
</table>

To conserve space in the table, and to minimize the translation difficulties between variable labels and their constructs, we periodically abbreviate the constructs as follows: 

CHANGE DETERMINATION = CD, STRUCTURAL SUPPORT = SS, SKILL DEVELOPMENT = SD, PROMOTION = P, SUCCESS SHARING = SH, BEHAVIOR MANAGEMENT = BM, CONTROL = C, CHANGE ACHIEVEMENT = CA.

Scatter plots suggested a non-linear relationship between CONTROL and the other scales. The X7 (CONTROL) scale was transformed using an $X^2$ function to improve the linearity. The correlation matrix for the data set appears in Table 4.22. As noted in the previous section, considerable multicollinearity exists in the data. Indeed, all of the correlations are statistically significant except for two related to BEHAVIOR MANAGEMENT (X6).

Table 4.22: Correlation Matrix of the Summated Scales

<table>
<thead>
<tr>
<th></th>
<th>CD (X1)</th>
<th>SS (X2)</th>
<th>SD (X3)</th>
<th>P (X4)</th>
<th>SH (X5)</th>
<th>BM (X6)</th>
<th>C (X7)</th>
<th>CA (X8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD (X1)</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS (X2)</td>
<td>**.503</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD (X3)</td>
<td>**.303</td>
<td>**.566</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P (X4)</td>
<td>**.547</td>
<td>**.548</td>
<td>**.452</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SH (X5)</td>
<td>**.439</td>
<td>**.422</td>
<td>**.399</td>
<td>**.587</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BM (X6)</td>
<td>**.273</td>
<td>.175</td>
<td>.139</td>
<td>**.267</td>
<td>**.473</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C (X7)</td>
<td>**.351</td>
<td>**.397</td>
<td>**.527</td>
<td>**.346</td>
<td>**.385</td>
<td>**.465</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>CA (X8)</td>
<td>**.475</td>
<td>**.426</td>
<td>**.431</td>
<td>**.296</td>
<td>**.313</td>
<td>**.533</td>
<td>**.575</td>
<td>1.000</td>
</tr>
</tbody>
</table>

** p<.01

Note that each of the seven CHANGE PROCESS variables correlates significantly to the CHANGE ACHIEVEMENT variable X8. This finding provides us with initial support for the predictive validity of the model. Ranking the CHANGE PROCESS variables from highest to lowest correlation to CHANGE ACHIEVEMENT results in: CONTROL (X7), BEHAVIOR
MANAGEMENT (X6), CHANGE DETERMINATION (X1), STRUCTURAL SUPPORT (X2), SKILL DEVELOPMENT (X3), SUCCESS SHARING (X5), PROMOTION (X4).

Simple Regression

Initially, we examine the overall relationship between CHANGE PROCESS and CHANGE ACHIEVEMENT. CHANGE PROCESS is a composite of variables X1 through X7, determined by calculating the mean of seven variables for each individual survey respondent. The relationship between CHANGE PROCESS and CHANGE ACHIEVEMENT is portrayed in Figure 4.1. A positive relationship between the two variables clearly exists.

Figure 4.1: Relationship Between CHANGE PROCESS and CHANGE ACHIEVEMENT

Using a simple regression model $Y = b_0 + b_1 V_1$ (where $V_1$ is the independent variable of interest—in this case the CHANGE PROCESS composite), we find a significant positive relationship. The regression coefficient $b_1$ is highly significant ($b_1 = .803, t = 7.60$). The regression model indicates that for each one point increase in the composite CHANGE PROCESS measure, CHANGE ACHIEVEMENT increases by about .8 on average (95% confidence limits on $b_1$ are .594 to 1.013). The coefficient of determination ($R^2$) is .383.
Like the straightforward visual inspection of the correlation matrix (Table 4.24) performed above, a relatively simple regression analysis contributes strong evidence towards the criterion-related validity of the CQM model.

4.2.2 Multiple regression

Although the criterion-related validity of the overall model is supported by the simple regression above, it is important to understand the multivariate relationship between the seven CHANGE PROCESS variables and CHANGE ACHIEVEMENT. The multiple regression model is:

Predicted CHANGE ACHIEVEMENT = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7

where X_1 through X_7 are the seven CHANGE PROCESS summated scales.

Note that we include no terms to account for interaction effects in our multiple regression model. Interaction occurs when the relationship between an independent variable and a dependent variable is affected by a second independent variable (Jaccard, Turrisi, and Wan 1990). Although it is plausible to propose possible interaction effects between some or all of the CHANGE PROCESS variables, including such terms complicates our investigation and exacerbates our over-fitting problem by reducing the sample-to-variable ratio. We defer investigation of interaction effects for future research with the model.

a) Confirmatory Regression Model

First, we estimate what is often referred to as a confirmatory multiple regression model, where all seven independent variables are entered into the regression equation (Hair et al. 1998). Confirmatory regression models allow the researcher to maintain control over the regression variate and are viewed as appropriate in certain validation situations. However, a drawback to the confirmatory multiple regression approach is that multicollinearity saps the strength and significance of the independent variables on the regression equation.
Table 4.23 contains the results of our confirmatory regression. The adjusted coefficient of multiple determination is .505—higher than the $R^2$ of our simple regression above. This indicates that we can explain more of the variance in \textit{CHANGE ACHIEVEMENT} by examining the seven individual \textit{CHANGE PROCESS} variables.

The analysis of variance suggests a highly significant overall regression model. However, an examination of the regression variate itself finds that many of the standardized beta coefficients ($X_2$, $X_4$, $X_5$) are not significant at $p = .05$. Due to the multicollinearity between variables, it is misleading to interpret these variables as not contributing to the prediction of \textit{CHANGE ACHIEVEMENT}. After all, we noted above that each of the seven summated scales of \textit{CHANGE PROCESS} correlated significantly with \textit{CHANGE ACHIEVEMENT} (Table 4.22).

\begin{table}[h]
\centering
\begin{tabular}{lrrrr}
\hline
& \textbf{Sum of} & \textbf{df} & \textbf{Mean Square} & \textbf{F} & \textbf{Sig.} \\
\hline
\textbf{Regression} & 31.505 & 7 & 4.501 & 14.100 & .000 \\
\textbf{Residual} & 26.494 & 83 & .319 & & \\
\textbf{Total} & 57.998 & 90 & & & \\
\hline
\end{tabular}
\caption{Confirmatory Regression Results Using All Seven \textit{CHANGE PROCESS} Variables}
\end{table}

\begin{table}[h]
\centering
\begin{tabular}{llllll}
\hline
\textbf{Unstandard} & \textbf{Standardized} & & & & \\
\textbf{Coefficients} & \textbf{B} & \textbf{Std. Error} & \textbf{Beta} & \textbf{t} & \textbf{Sig.} \\
\hline
\textbf{(Constant)} & -.007 & .267 & -.026 & .979 \\
\textit{CD} (X1) & .305 & .094 & .309 & 3.244 & .002 \\
\textit{SS} (X2) & .113 & .094 & .123 & 1.205 & .232 \\
\textit{SD} (X3) & .175 & .085 & .214 & 2.056 & .043 \\
\textit{P} (X4) & -.125 & .101 & -.133 & -1.241 & .218 \\
\textit{SH} (X5) & -.132 & .086 & -.160 & -1.540 & .127 \\
\textit{BM} (X6) & .400 & .097 & .390 & 4.138 & .000 \\
\textit{C} (X7) & .044 & .019 & .232 & 2.293 & .024 \\
\hline
\end{tabular}
\caption{Unstandardized and Standardized Regression Coefficients}
\end{table}

In our case, the excessive multicollinearity between the independent variables makes interpretation of the confirmatory regression model difficult. Although control is maintained over the independent variables included in the regression variate, the cost is poorer prediction and explanation.
b) Stepwise Regression

An alternative to the “all variables in” confirmatory approach is stepwise multiple regression. Stepwise regression is a sequential approach where the variable having the highest statistically significant correlation with dependent variable is entered first. As new variables are entered into the model, the original variables as well as the new one are retested for significance in the expanded model. The procedure continues until no additional significant independent variables can be added.

Stepwise regression is not oblivious to the multicollinearity problem. Suppose highly correlated independent variables have about equal correlations with the dependent variable (for example, from Table 4.22, STRUCTURAL SUPPORT (X2) and SKILL DEVELOPMENT (X3) fit this scenario). If one of these variables enters the model, say X3, then it is unlikely that the other variable will also enter because these variables are highly correlated and there is little unique variance stemming from each variable separately. Thus, the prudent researcher returns to the original correlation matrix to assess multicollinearity to avoid the erroneous conclusion that the variables that do not enter the model are inconsequential.

The stepwise regression results for our model appear in Table 4.24. Three variables CHANGE DETERMINATION (X1), BEHAVIOR MANAGEMENT (X6), and CONTROL (X7) entered the model. The first variable to enter the model, CONTROL (X7), can be viewed as the variable having the most unique significant contribution to the model. This may not come as much of a surprise, since we previously identified CONTROL to have the highest correlation with CHANGE ACHIEVEMENT in our review of the correlation matrix (Table 4.22). CONTROL explains 33.6% (the $R^2$) of the total variation in CHANGE ACHIEVEMENT. Adding the second variable, CHANGE DETERMINATION (X1), improves the total amount of variation explained to 41.2%. BEHAVIOR MANAGEMENT (X6) makes an incremental significant contribution. The total amount of variance in CHANGE ACHIEVEMENT (X8) explained by these three variables is
about 47%. Note that the final $R^2$ values of the stepwise regression are slightly lower than the confirmatory regression above.

The partial correlations of the remaining variables are relatively small and insignificant, indicating that little additional explanation is gained by adding them to the predictive equation. Again, this may not be too surprising after examination the initial correlation matrix in Table 4.22. *SKILL DEVELOPMENT* ($X_3$), which just missed entering the model at the .05 level (it would have entered at the .10 level), correlates about the same to *CHANGE ACHIEVEMENT* as *STRUCTURAL SUPPORT* ($X_2$), and the inter correlation between $X_2$ and $X_3$ is high (close to .6). *STRUCTURAL SUPPORT* offers little unique contribution to the model. While *PROMOTION* ($X_4$) and *SUCCESS SHARING* ($X_5$) also correlate significantly to other independent variables, these two variables rank the lowest in their correlations to the dependent $X_8$ variable.

### Table 4.24: Stepwise Multiple Regression Results

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.586</td>
<td>.343</td>
<td>.336</td>
<td>.6541</td>
</tr>
<tr>
<td>2</td>
<td>.652</td>
<td>.425</td>
<td>.412</td>
<td>.6156</td>
</tr>
<tr>
<td>3</td>
<td>.698</td>
<td>.488</td>
<td>.470</td>
<td>.5844</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>28.285</td>
<td>3</td>
<td>9.428</td>
<td>27.605</td>
</tr>
<tr>
<td>Residual</td>
<td>29.714</td>
<td>87</td>
<td>.342</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>57.998</td>
<td>90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.252</td>
<td></td>
<td>1.126</td>
<td>.263</td>
</tr>
<tr>
<td>$C$ ($X_7$)</td>
<td>6.724E-02</td>
<td>.017</td>
<td>.357</td>
<td>3.957</td>
</tr>
<tr>
<td>$CD$ ($X_1$)</td>
<td>.272</td>
<td>.081</td>
<td>.276</td>
<td>3.350</td>
</tr>
<tr>
<td>$BM$ ($X_6$)</td>
<td>.292</td>
<td>.089</td>
<td>.284</td>
<td>3.260</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partial Correlation</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SS$ ($X_2$)</td>
<td>.148</td>
</tr>
<tr>
<td>$SD$ ($X_3$)</td>
<td>.195</td>
</tr>
<tr>
<td>$P$ ($X_4$)</td>
<td>-.094</td>
</tr>
<tr>
<td>$SH$ ($X_5$)</td>
<td>-.137</td>
</tr>
</tbody>
</table>
Before interpreting the regression variate, we examined standardized partial regression plots, residual plots, and normal probability plots and found no significant violations of linearity, homoscedasticity, or normality assumptions.

Using the standardized beta coefficients in the final model, the predictive equation is:

\[
\text{Predicted } \text{CHANGE ACHIEVEMENT} = .252 + .276X1 + .284X6 + .357X7
\]

The relative size and significance of the beta coefficients, along with their order of entry into the model, suggest that \textit{CONTROL (X7)}, \textit{CHANGE DETERMINATION (X1)}, and \textit{BEHAVIOR MANAGEMENT (X6)} merit more attention as predictors of \textit{CHANGE ACHIEVEMENT (X8)}.

Various measures are available for assessing the impact of collinearity. The tolerance value is one minus the proportion of a variable’s variance explained by the other independent variables. A high tolerance value indicates little collinearity. It’s reciprocal, the Variance Inflation Factor (VIF), is often used since it is easy to quickly view a VIF’s proximity to the ideal 1.0 level. A VIF of 10 (tolerance of .1) is a commonly held threshold for unacceptable collinearity. Table 4.25 suggests that none of the independent variables in the \textit{CHANGE PROCESS} model exhibit these extreme levels.

<table>
<thead>
<tr>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included variables:</td>
<td></td>
</tr>
<tr>
<td>CD (X1)</td>
<td>.866</td>
</tr>
<tr>
<td>X6</td>
<td>.774</td>
</tr>
<tr>
<td>X7</td>
<td>.725</td>
</tr>
<tr>
<td>Excluded variables:</td>
<td></td>
</tr>
<tr>
<td>X2</td>
<td>.686</td>
</tr>
<tr>
<td>X3</td>
<td>.679</td>
</tr>
<tr>
<td>X4</td>
<td>.673</td>
</tr>
<tr>
<td>X5</td>
<td>.666</td>
</tr>
</tbody>
</table>

Although it appears that multicollinearity does not substantially impact the estimated stepwise regression variate, it does impact the variate’s composition. As noted above, \textit{SKILL DEVELOPMENT (X3)} narrowly missed being included in the stepwise regression model. If \textit{SKILL DEVELOPMENT was} included in the model (which is possible with slightly relaxed rules
for entering and removing variables using the stepwise procedure), the chances of **STRUCTURAL SUPPORT** (X2) being included in the model would be slim, due to X2 and X3’s similar relationship to **CHANGE ACHIEVEMENT** (X8) and their strong relationship to each other. It is useful to realize that if either **STRUCTURAL SUPPORT** or **SKILL DEVELOPMENT** entered this model, the similarity of their effect on **CHANGE ACHIEVEMENT** requires only one of them in the predictive model.

The predictive contribution of **PROMOTION** (X4) and **SUCCESS SHARING** (X5) is less substantial than the other independent variables. Recall that these two variables ranked lowest in correlation to **CHANGE ACHIEVEMENT** (Table 4.22). In the confirmatory model (Table 4.23), the beta coefficients of **PROMOTION** and **SUCCESS SHARING** were the least significant of any of the seven independent variables. These two variables appear to provide little additional predictive improvement to the overall model. Indeed, based on review of the correlation matrix (Table 4.22), the confirmatory regression, and the stepwise regression, **PROMOTION** and **SUCCESS SHARING** appear to be the least effective predictors of **CHANGE ACHIEVEMENT**.

### 4.2.3 Canonical correlation

Canonical correlation analysis examines the association between composite sets of multiple dependent and independent variables. Indeed it is one of the few techniques available for examining relationships when there is more than one dependent variable (Hair et al. 1998). Since the original 6-indicator **CHANGE ACHIEVEMENT** scale can be viewed as six individual dependent variables (i.e., Y1 through Y6), we included canonical correlation analysis to further our perspective on the criterion-related validity of the CQM model.

Canonical correlation was originally developed by Hotelling (1935, 1936) to measure relationships in education, such as prowess in arithmetic to prowess in reading. The analysis focuses on the correlation between a linear combination of variables in one set and a linear combination of variables in the other set. The idea is to determine first the pair of linear combinations having the largest correlation, then the linear combination having the largest
correlation among all pairs uncorrelated with the initial pair. Theoretically, the number of canonical variates equals the number of variables in the smaller data set (usually the dependent Y variable).

Canonical correlation places the fewest restrictions on the types of data on which it operates. Therefore, it is often believed that the resulting information is of lower quality than the information obtained by more rigid techniques (Hair et al. 1998). However, its ability to handle sets of multiple dependent as well as independent variables makes canonical correlation an attractive option for assessing relationships in many multivariate studies.

Data and Assumptions

For our canonical correlation analysis, we revert back to the initial 35 indicator data set used in the first part of this chapter to evaluate construct validity (see Tables 4.1 and 4.3 for a descriptive overview). This data set includes 29 indicators of CHANGE PROCESS (the independent variables) and 6 indicators of CHANGE ACHIEVEMENT (the dependent variables). No indicators have been removed for this analysis.

Similar to other techniques we have employed in this analysis, canonical correlation analysis assumes linearity. Thus we continue to employ the transformed CONTROL scale that we have utilized previously. Normality is not strictly required but recommended (Hair et al. 1998). Multicollinearity confounds the ability of the technique to isolate the impact of any scale variable, making interpretation less reliable. We will need to interpret our findings in light of the multicollinearity that we have identified in our data set.

Deriving the Canonical Functions and Overall Fit Assessment

The canonical procedure resulted in six canonical variates—we get six variates because there are 6 variables in the dependent variable data set. Measures of overall fit for the six canonical variates appear in Table 4.26. Only the first two canonical correlations are statistically significant. The two significant canonical correlations, .870 and .792, are sufficient in size to be practically significant as well and thus merit further analysis.
Table 4.26: Canonical Correlation Results

<table>
<thead>
<tr>
<th>Variate Number</th>
<th>Canonical Correlation</th>
<th>Squared Canonical Correlation</th>
<th>F-Value</th>
<th>Prob</th>
<th>Wilks' Lambda</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.870</td>
<td>0.757</td>
<td>1.90</td>
<td>0.000</td>
<td>0.015</td>
</tr>
<tr>
<td>2</td>
<td>0.792</td>
<td>0.628</td>
<td>1.46</td>
<td>0.004</td>
<td>0.060</td>
</tr>
<tr>
<td>3</td>
<td>0.701</td>
<td>0.491</td>
<td>1.17</td>
<td>0.163</td>
<td>0.161</td>
</tr>
<tr>
<td>4</td>
<td>0.619</td>
<td>0.383</td>
<td>0.99</td>
<td>0.503</td>
<td>0.317</td>
</tr>
<tr>
<td>5</td>
<td>0.552</td>
<td>0.305</td>
<td>0.89</td>
<td>0.680</td>
<td>0.514</td>
</tr>
<tr>
<td>6</td>
<td>0.511</td>
<td>0.261</td>
<td>0.84</td>
<td>0.673</td>
<td>0.739</td>
</tr>
</tbody>
</table>

Note that the squared canonical correlations are higher than the coefficients of multiple determination from our earlier regression analysis. It is tempting to assume that the canonical analysis has revealed substantial relationships of interest. However, the squared canonical correlations represent the variance shared by linear combinations of sets of dependent and independent variables and not the variance extracted from the sets of variables (Alpert and Peterson 1972). A squared canonical correlation only tells us about the amount of variance that two canonical variates share, and does not necessarily reveal the possible significant overlap in variance between the two sets of variables (Stevens 1986).

Various attempts have been made to account for the informational overlap between the sets of variables used in canonical correlation. Stewart and Love’s (1968) redundancy index has often been promoted as a technique for capturing the overlap (see for example, Hair et al. 1998). However, a drawback to the redundancy index is its insensitivity to the degree of correlation between dependent variables (see Stevens 1986). Cramer and Nicewander (1979) recommended using the average squared canonical correlation as a measure of variance accounted for. With our six canonical variates, the average squared canonical correlation was .471, suggesting that about 47% of the variance is accounted for by the canonical variates.

Interpreting the Canonical Variates

Table 4.27 contains the canonical loadings and canonical cross loadings for the two canonical variates. Canonical loadings, also known as canonical structure correlations, measure
the linear correlation between an original observed variable in the dependent set or independent set, and the set’s canonical variate (which has been developed to maximize correlation to the other variate). The canonical loading reflects the variance that the observed variable shares with the canonical variable, and can be interpreted like a factor loading from the standpoint of assessing the relative contribution of each variable to each canonical function (Hair et al. 1998). The higher the loading, the more important the variable is in deriving the canonical variate.

One of the first things to notice about the first variate is that all variables exhibit a negative canonical loading. While all variables move in the same direction, this is an unexpected finding that might signal a problem with some variable(s) in the model. Indeed, in subsequent runs where some Y variables were removed from the model, the negative canonical loadings disappeared.

The first dependent variate has two loadings that exceed .7 (Y81 and Y85). These two variables, along with Y84, had earlier appeared to best represent the CHANGE ACHIEVEMENT scale in our confirmatory factor analysis of the construct. The high degree of inter-correlation between these variables suggests that either, or both, are representative effects measures. Y82 and Y83 do not appear to be representative effects measures of this variate.

The first independent variate exhibits a range of factor loadings from about .1 (X63 and X64) to above .6 (X15, X32, X72, X73). Note that this variate does not closely correspond to the dimensions extracted in our factor analysis above, but it should not be expected to since the canonical variates are extracted to maximize predictive objectives. Canonical analysis should correspond more to other dependence techniques, such as multiple regression (Hair et al. 1998). Note, though, that the first independent canonical variate does not quite mirror our earlier multiple regression findings. The indicators of BEHAVIOR MANAGEMENT, found to be a significant variable in our multiple regression, have poor canonical loadings. Conversely, indicators of SKILL DEVELOPMENT and PROMOTION, two scales that did not contribute significantly to our stepwise regression, performed somewhat better here.
### Table 4.27: Canonical Loadings and Cross Loadings for the Two Canonical Variates

<table>
<thead>
<tr>
<th>Function 1</th>
<th>Function 2</th>
<th>Function 1</th>
<th>Function 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlations between independent variables and</td>
<td>Correlations between independent variables and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>their canonical variates (X vs. X)</td>
<td>dependent canonical variates (X vs. Y)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X11 -0.272</td>
<td>0.149</td>
<td>-0.236</td>
<td>0.118</td>
</tr>
<tr>
<td>X12 -0.364</td>
<td>0.315</td>
<td>-0.317</td>
<td>0.250</td>
</tr>
<tr>
<td>X13 -0.253</td>
<td>0.159</td>
<td>-0.220</td>
<td>0.126</td>
</tr>
<tr>
<td>X14 -0.526</td>
<td>0.074</td>
<td>-0.458</td>
<td>0.059</td>
</tr>
<tr>
<td>X15 -0.608</td>
<td>0.105</td>
<td>-0.529</td>
<td>0.083</td>
</tr>
<tr>
<td>X21 -0.365</td>
<td>0.141</td>
<td>-0.318</td>
<td>0.112</td>
</tr>
<tr>
<td>X22 -0.195</td>
<td>0.010</td>
<td>-0.170</td>
<td>0.008</td>
</tr>
<tr>
<td>X23 -0.201</td>
<td>0.288</td>
<td>-0.175</td>
<td>0.228</td>
</tr>
<tr>
<td>X24 -0.488</td>
<td>-0.053</td>
<td>-0.425</td>
<td>-0.042</td>
</tr>
<tr>
<td>X25 -0.672</td>
<td>-0.116</td>
<td>-0.585</td>
<td>-0.092</td>
</tr>
<tr>
<td>X31 -0.494</td>
<td>0.118</td>
<td>-0.430</td>
<td>0.093</td>
</tr>
<tr>
<td>X32 -0.626</td>
<td>-0.064</td>
<td>-0.545</td>
<td>-0.051</td>
</tr>
<tr>
<td>X33 -0.485</td>
<td>-0.228</td>
<td>-0.422</td>
<td>-0.181</td>
</tr>
<tr>
<td>X34 -0.489</td>
<td>-0.015</td>
<td>-0.425</td>
<td>-0.012</td>
</tr>
<tr>
<td>X41 -0.372</td>
<td>-0.235</td>
<td>-0.324</td>
<td>-0.186</td>
</tr>
<tr>
<td>X42 -0.399</td>
<td>-0.179</td>
<td>-0.347</td>
<td>-0.141</td>
</tr>
<tr>
<td>X43 -0.440</td>
<td>0.041</td>
<td>-0.383</td>
<td>0.032</td>
</tr>
<tr>
<td>X51 -0.476</td>
<td>-0.028</td>
<td>-0.415</td>
<td>-0.022</td>
</tr>
<tr>
<td>X52 -0.356</td>
<td>-0.067</td>
<td>-0.310</td>
<td>-0.053</td>
</tr>
<tr>
<td>X53 -0.317</td>
<td>0.023</td>
<td>-0.276</td>
<td>0.018</td>
</tr>
<tr>
<td>X54 -0.198</td>
<td>0.275</td>
<td>-0.173</td>
<td>0.218</td>
</tr>
<tr>
<td>X61 -0.473</td>
<td>0.292</td>
<td>-0.412</td>
<td>0.232</td>
</tr>
<tr>
<td>X62 -0.433</td>
<td>0.151</td>
<td>-0.377</td>
<td>0.120</td>
</tr>
<tr>
<td>X63 -0.150</td>
<td>0.254</td>
<td>-0.131</td>
<td>0.201</td>
</tr>
<tr>
<td>X64 -0.149</td>
<td>0.487</td>
<td>-0.130</td>
<td>0.386</td>
</tr>
<tr>
<td>X71 -0.433</td>
<td>0.296</td>
<td>-0.377</td>
<td>0.234</td>
</tr>
<tr>
<td>X72 -0.623</td>
<td>0.057</td>
<td>-0.542</td>
<td>0.045</td>
</tr>
<tr>
<td>X73 -0.642</td>
<td>0.163</td>
<td>-0.559</td>
<td>0.129</td>
</tr>
<tr>
<td>X74 -0.471</td>
<td>0.143</td>
<td>-0.409</td>
<td>0.114</td>
</tr>
</tbody>
</table>

| Correlations between dependent variables and |
| independent canonical variates (Y vs. X) |
| Y81 -0.768 | -0.010 | -0.668 | -0.008 |
| Y82 -0.037 | 0.361 | -0.032 | 0.286 |
| Y83 -0.255 | 0.902 | -0.221 | 0.715 |
| Y84 -0.588 | 0.087 | -0.512 | 0.069 |
| Y85 -0.803 | 0.294 | -0.699 | 0.233 |
| Y86 -0.685 | -0.164 | -0.596 | -0.130 |

Keep in mind that this canonical variate includes all individual indicators of *CHANGE PROCESS* and *CHANGE ACHIEVEMENT* rather than the summated scales used in our regression analysis. The other noteworthy point is that canonical loadings of the first independent
variate appear to correspond to predicting a subset of *CHANGE ACHIEVEMENT*, Y81, Y84, Y85, and Y86.

The canonical loadings of the second dependent and independent variates are much lower overall than the loadings on the first variate. This suggests that the second variate is of little significance. The second dependent variate does contain one high loading (X84). There appears to be only one variable in the second independent variate, X64, that appears remotely related to the dependent variable set. Overall, the low loadings and the difficulty in interpretation suggest that this second variate, while found statistically significant, is of little explanatory value.

Canonical cross loadings have been proposed as alternatives to canonical loadings (Lambert and Durand 1975). The procedure involves correlating each of the dependent variables with the independent variable variate, and vice versa. Cross loadings are thought to provide a more direct measure of the dependent-independent variable relationships by directly linking the independent variables directly to the dependent variate (Hair et al. 1998). In Table 4.27, the canonical cross loadings, while lower than the canonical loadings, reflect the same general patterns as the canonical loadings.

The findings of our canonical analysis suggest one theoretically significant variate. The first dependent variate suggests that two variables, X81 and X85 best represent the effects of *CHANGE PROCESS* on change achievement. The loadings on most variables in the first independent variate are relatively low, suggesting that the percentage of variance of any individual variable is not well explained by the dependent variate. Multicollinearity, which we have previously highlighted in our analysis, has been found to confound the ability of canonical correlation to isolate the impact of any single variable; multicollinearity may be contributing to our inability to extract crisp meaning from this analysis.

Another technical issue with our canonical correlation analysis is the low sample-to-variable ratio. The 35-indicator model tested above provides less than a 3-to-1 ratio. This is far below commonly cited thresholds for canonical correlation analysis. Stevens (1986), for
example, proposed ratios of 20- to 40- to one as minimum requirements for effective canonical correlation analysis. This low ratio surely contributes to some of our interpretational problems and makes any conclusions highly tentative. To explore the possible changes in the analysis with a higher sample-to-variable ratio, we ran additional canonical correlation analyses on reduced sets of variables. While these reduced models still fell far short of the 20-to-1 benchmark of samples to variables, the information provides a useful comparison to our full model.

Tables 4.28 and 4.29 portray the canonical correlation analysis performed on one of these reduced models. In this model, we included 14 independent variable indicators (two from each of the seven constructs of CHANGE PROCESS) and 3 dependent variable indicators of CHANGE ACHIEVEMENT. This improved our sample-to-variable ratio to greater than 5.

One significant canonical variate was extracted (Table 4.28). The average squared canonical correlation of the three variates suggests that the amount of variance explained is about 25%—less than the canonical analysis performed on the full model. When interpreting the single variate that was significant (Table 4.29), notice first that the negative canonical loadings apparent in the full model reported above (see Table 4.27) have disappeared. The canonical loadings of the three dependent indicators are above .6; Y85’s loading is .9. The most significant independent variable loadings come from one variable of SKILL DEVELOPMENT (X32) and the two variables of CONTROL (X72 and X73).

Due to the recognized limitations of our canonical correlation study, we can conclude relatively little. We attempted the technique since it is one of the few methods for assessing the relationships between multivariate data sets when more than one dependent variable exists. Any conclusions drawn from our analysis must be highly tentative due to the multicollinearity between our variables, and our small sample size. Our analysis does suggest that the variables of CHANGE PROCESS appear to correlate to a single combination of CHANGE ACHIEVEMENT indicators (best represented by X81 and X85). There is also additional evidence of the relatively strong relationship between indicators of CONTROL and indicators of CHANGE.
ACHIEVEMENT. Concluding more from canonical correlation analysis will require a much larger sample.

Table 4.28: Canonical Correlation Results for Reduced Variable Set

<table>
<thead>
<tr>
<th>Variate Number</th>
<th>Canonical Correlation</th>
<th>Squared Canonical Correlation</th>
<th>F-Value</th>
<th>Prob Level</th>
<th>Wilks' Lambda</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.681</td>
<td>0.463</td>
<td>1.810</td>
<td>0.004</td>
<td>0.397</td>
</tr>
<tr>
<td>2</td>
<td>0.407</td>
<td>0.166</td>
<td>0.890</td>
<td>0.627</td>
<td>0.740</td>
</tr>
<tr>
<td>3</td>
<td>0.335</td>
<td>0.112</td>
<td>0.760</td>
<td>0.689</td>
<td>0.888</td>
</tr>
</tbody>
</table>

Table 4.29: Canonical Loadings and Cross Loadings for Reduced Variable Set

<table>
<thead>
<tr>
<th>Canonical Loadings</th>
<th>Canonical Cross Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function 1</td>
<td>Function 1</td>
</tr>
<tr>
<td>Correlations between independent variables and their canonical variates (X vs. X)</td>
<td>Correlations between independent variables and dependent canonical variates (X vs. Y)</td>
</tr>
<tr>
<td>X11 0.288</td>
<td>0.196</td>
</tr>
<tr>
<td>X13 0.336</td>
<td>0.229</td>
</tr>
<tr>
<td>X22 0.128</td>
<td>0.087</td>
</tr>
<tr>
<td>X23 0.210</td>
<td>0.143</td>
</tr>
<tr>
<td>X31 0.562</td>
<td>0.383</td>
</tr>
<tr>
<td>X32 0.721</td>
<td>0.491</td>
</tr>
<tr>
<td>X42 0.370</td>
<td>0.252</td>
</tr>
<tr>
<td>X43 0.475</td>
<td>0.323</td>
</tr>
<tr>
<td>X51 0.503</td>
<td>0.343</td>
</tr>
<tr>
<td>X52 0.415</td>
<td>0.282</td>
</tr>
<tr>
<td>X63 0.330</td>
<td>0.224</td>
</tr>
<tr>
<td>X64 0.342</td>
<td>0.233</td>
</tr>
<tr>
<td>X72 0.769</td>
<td>0.523</td>
</tr>
<tr>
<td>X73 0.797</td>
<td>0.542</td>
</tr>
</tbody>
</table>

| Correlations between independent variables and their canonical variates (Y vs. Y) | Correlations between dependent variables and independent canonical variates (Y vs. X) |
| Y81 0.630 | 0.429 |
| Y84 0.612 | 0.417 |
| Y85 0.917 | 0.624 |

4.2.4 Structural equation model

For a final perspective on the predictive validity of the CQM measurement model, we evaluated the relationship between the seven exogenous constructs of CHANGE PROCESS on the endogenous construct of CHANGE ACHIEVEMENT using structural equation modeling (SEM) techniques. SEM offers some advantages over other dependence techniques. Perhaps most
importantly, SEM can accommodate a number of interrelated dependence relationships in a single model. Unlike multiple regression, SEM can estimate many equations at once, allowing the researcher to model complex relationships that are not possible using other multivariate techniques. Thus, SEM can be useful in behavioral or social science situations, where the variables and their relationships are complex.

Our model is based on the proposed relationship between *CHANGE PROCESS* and *CHANGE ACHIEVEMENT*. Our earlier findings from the confirmatory factor analysis investigation suggested that the appropriate *CHANGE PROCESS* model was a first order model with correlated factors. A path diagram that portrays the proposed causal relationship for a seven factor first order model of *CHANGE PROCESS* and *CHANGE ACHIEVEMENT* that includes all original variables appears in Figure 4.2.

*Model Specification*

The general measurement models for *CHANGE PROCESS* and *CHANGE ACHIEVEMENT* were specified in our earlier CFA section. We do not repeat the specifications of these two models here (see the previous section on construct validity for the general model specifications).

Table 4.30 specifies the structural equation relationships that reflect the path diagram in Figure 4.2. To conserve space in the table, the constructs are abbreviated as follows: *CHANGE DETERMINATION* = CD, *STRUCTURAL SUPPORT* = SS, *SKILL DEVELOPMENT* = SD, *PROMOTION* = P, *SUCCESS SHARING* = SH, *BEHAVIOR MANAGEMENT* = BM, *CONTROL* = C, *CHANGE ACHIEVEMENT* = CA. b1 through b7 represent the structural coefficients for the hypothesized effect of each of the seven *CHANGE PROCESS* factors on *CHANGE ACHIEVEMENT*. The larger the coefficient, the stronger the relationship between the factors.
Figure 4.2: Path Diagram for Structural Equation Model

![Path Diagram](image)

Table 4.30: Structural Equation Relationships of Path Model

<table>
<thead>
<tr>
<th>Endogenous Variable</th>
<th>Exogenous</th>
<th>Endogenous</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CD</td>
<td>SS</td>
</tr>
<tr>
<td>CA</td>
<td>b₁</td>
<td>b₂</td>
</tr>
</tbody>
</table>

Model Estimation and Fit Assessment

As noted in our confirmatory factor analysis section, a limitation of our study is our small observation-to-variable ratio of about 3. This situation carries over to SEM and actually worsens as we combine the CHANGE PROCESS measurement model with the CHANGE

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ACHIEVEMENT measurement model. Previously, however, we have suggested that a reduction in variables may be theoretically justified. Variable reduction not only improves parsimony, but it also improves the technical fit of the model. By reducing the number of variables in the CHANGE PROCESS model to 20 or less, we approached benchmarks often associated with good model fit (see Table 4.11).

We use a similar competing model strategy here that we used during our confirmatory factor analysis step. We estimated a number of structural equation models. All of them consisted of first-order configurations with factors of CHANGE PROCESS “causing” CHANGE ACHIEVEMENT as shown in Figure 4.2. Table 4.31 displays the variables included in each model. Note that in addition to the models with seven factors (M1 through M5), we also estimated some models with some factors of CHANGE PROCESS removed (M6 and M7). Our regression analysis suggested that these factors had perhaps less predictive ability than the other models; we wanted to observe the effects when these factors were removed from the model.

Table 4.31: Variables Included in Structural Equation Models

<table>
<thead>
<tr>
<th>Model</th>
<th>CD</th>
<th>SS</th>
<th>SD</th>
<th>P</th>
<th>SH</th>
<th>BM</th>
<th>C</th>
<th>CA</th>
<th>Ratio of Observations to Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>X11 X12 X13 X14 X15</td>
<td>X21 X22 X23 X24</td>
<td>X31 X32 X33 X34</td>
<td>X41 X42 X43</td>
<td>X51 X52 X53 X54</td>
<td>X62 X63 X64</td>
<td>X71 X72 X73</td>
<td>Y81 X84 Y85</td>
<td>3.3</td>
</tr>
<tr>
<td>M2</td>
<td>X11 X12 X13 X14</td>
<td>X21 X22 X23</td>
<td>X31 X32 X33 X34</td>
<td>X42 X43</td>
<td>X51 X52 X53</td>
<td>X62 X63 X64</td>
<td>X71 X72 X73</td>
<td>Y81 Y84 Y85</td>
<td>3.8</td>
</tr>
<tr>
<td>M3</td>
<td>X11 X12 X13</td>
<td>X22 X23</td>
<td>X31 X32</td>
<td>X42 X43</td>
<td>X51 X52 X53</td>
<td>X63 X64</td>
<td>X71 X72 X73</td>
<td>Y81 Y84 Y85</td>
<td>4.6</td>
</tr>
<tr>
<td>M4</td>
<td>X11 X12 X13</td>
<td>X22 X23</td>
<td>X31 X32 X33</td>
<td>X42 X43</td>
<td>X51 X52</td>
<td>X63 X64</td>
<td>X72 X73</td>
<td>Y81 Y85</td>
<td>5.3</td>
</tr>
<tr>
<td>M5</td>
<td>X11 X13</td>
<td>X22 X23</td>
<td>X31 X32</td>
<td>X42 X43</td>
<td>X51 X52</td>
<td>X63 X64</td>
<td>X72 X73</td>
<td>Y81 Y85</td>
<td>6.0</td>
</tr>
<tr>
<td>M6</td>
<td>X11 X13</td>
<td>X22 X23</td>
<td>X31 X32</td>
<td>X42 X43</td>
<td>X51 X52</td>
<td>X63 X64</td>
<td>X72 X73</td>
<td>Y81 Y85</td>
<td>8.0</td>
</tr>
<tr>
<td>M7</td>
<td>X11 X13</td>
<td>X31 X32</td>
<td>X42 X43</td>
<td>X51 X52</td>
<td>X63 X64</td>
<td>X72 X73</td>
<td>Y81 Y85</td>
<td>9.6</td>
<td></td>
</tr>
</tbody>
</table>

The structural equation model was estimated with the LISREL program (Joreskog and Sorbom 1993). Measures of fit appear in Table 4.32. The first two models containing a large
number of the CHANGE PROCESS variables (M1 and M2) fit relatively poorly. However, as more variables were removed, measures of fit improved dramatically. The seven factor models with two or three variables per indicator (M4 and M5) displayed good fit characteristics as indicated by the non significant chi-square values, high GFIs, and low RMSRs. The models with the best measures of fit were those with some factors of CHANGE PROCESS removed (M6 and M7).

<table>
<thead>
<tr>
<th></th>
<th>CP</th>
<th>CA</th>
<th>Absolute Fit</th>
<th>Incremental Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>nk</td>
<td>nx</td>
<td>ne</td>
<td>ny</td>
</tr>
<tr>
<td>M1</td>
<td>7</td>
<td>26</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>M2</td>
<td>7</td>
<td>22</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>M3</td>
<td>7</td>
<td>18</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>M4</td>
<td>7</td>
<td>16</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>M5</td>
<td>7</td>
<td>14</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>M6</td>
<td>5</td>
<td>10</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>M7</td>
<td>4</td>
<td>8</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Notes:
CP = CHANGE PROCESS; CA = CHANGE ACHIEVEMENT
nk = number of X factors; nx = number of X variables
ne = number of Y factors; ny = number of Y variables
no:ni = number of observations/ number of variables

Structural Model Fit

Although the measures of overall model fit were encouraging, the structural fit of the models was less spectacular. Table 4.33 contains the estimated standardized structural coefficients of the factors of CHANGE PROCESS estimated from the models. The higher and more significant the coefficient, the greater the relationship between the factor and the endogenous CHANGE ACHIEVEMENT factor. The results indicate that relatively few of the path coefficients are significant. Interestingly, some of the path coefficients found significant in the models with large variable sets (M1 and M2), became non-significant as model parsimony increased. The path coefficients of CHANGE DETERMINATION and BEHAVIOR MANAGEMENT both decreased as variables were removed. Conversely, the CONTROL factor became more prominent as model parsimony increased. In the most parsimonious models (M6
and M7), SKILL DEVELOPMENT and CONTROL were the only factors that were significant—at the .10 level.

We faced a dilemma in selecting a number of variables for removal in this progression of models. Often, a variable that correlated highly with indicators of CHANGE ACHIEVEMENT, also correlated highly with other variables of CHANGE PROCESS. X62 was one such example. Essentially, we are restating our multicollinearity problem. In these situations, we usually chose to eliminate these variables to improve the unidimensionality of the exogenous factors. Unidimensional scales are usually preferred over scales with little discriminatory power (Gerbing and Anderson 1988). In effect, by improving the model’s technical fit through eliminating variables with little discriminant validity, we may have compromised the predictive performance of some of the factors in the model.

Perhaps the most interesting finding of our SEM analysis relates to the factors found least significant in their relationship to CHANGE ACHIEVEMENT. Similar to our regression analysis findings, PROMOTION and SUCCESS SHARING did not relate significantly to CHANGE ACHIEVEMENT. The STRUCTURAL SUPPORT scale also performed poorly.
It is also worth noting that those factors that did exhibit some degree of significance here (CHANGE DETERMINATION, SKILL DEVELOPMENT, BEHAVIOR MANAGEMENT, and CONTROL) were also the highest performers in our regression study.

4.2.5 Assessment of criterion-related validity

In section 4.2, we utilized a number of techniques to gain perspective on the CQM model’s criterion-related validity. In essence, we tried to understand how well the change process variables related to the key output of interest, the achievement of change.

A scatter plot of the dependent versus dependent variable (Figure 4.1) and simple regression suggested that the model possessed significant predictive capability. More advanced techniques, such as multiple regression, canonical correlation, and path modeling verified this finding to various degrees. The multivariate techniques also shed some insight into a more advanced research question: Which change process variables really matter?

Answering this question accurately is a subject for future work. The initial evidence suggests some possibilities, however. Simple review of the various correlation matrices consistently indicated CONTROL, BEHAVIOR MANAGEMENT, and CHANGE DETERMINATION as strong predictors of CHANGE ACHIEVEMENT. While CHANGE DETERMINATION has long been investigated for its purported effect on achieving change, particularly of the large-scale strategic variety (e.g., Andrews 1971, Hofer and Schendel 1978), the notion of CONTROL’s importance in change achievement has not been deeply investigated. Indeed, a significant contribution of this investigation is identifying CONTROL as an important process factor that merits additional study in the context of change management.

Are certain change process variables significantly less important than others? Again, more work is necessary. These initial findings suggest that the constructs related to communication, PROMOTION and SUCCESS SHARING, require more investigation for their influence on change achievement. Our multivariate analyses suggested that these two constructs contributed little unique explanatory power to the CHANGE PROCESS model. This is also an
interesting finding, since the role of communication is often hyped as a key factor in achieving change. We saw little evidence to support that claim here.

4.3 Evaluating the Propositions

Early in Chapter 3, we specified two theoretical propositions that guided our work in Chapter 3 and 4. We now evaluate the legitimacy of those propositions, based on our findings from the last two chapters.

Proposition 4.1: A model for assessing the change process includes constructs related to determining the change, structuring the organization to support the change, developing the necessary skills, promotion, sharing successes associated with the change, managing people’s behavior, and monitoring and diagnosis to control the change’s implementation.

In Chapter 3 we found considerable theoretical support for a conceptual model with elements of change process specified in this proposition. However, much of the theoretical support is fragmented and various theories must be knitted together to resemble the integrated CQM model. Of course, the complex, multidisciplinary nature of change implementation has been widely recognized by scholars (Barnard 1938, Anthony 1965, Hrebeniak and Joyce 1984) and any model of change should draw from a rich mixture of literature streams. Of the seven elements of change process specified in Proposition 4.1, the concept of managerial control as a prominent, high-order construct in a model of change process is perhaps the most distinguishing feature of this model when compared to other change models.

The model proposed in Proposition 4.1 appears to “ring true” among practitioners. Of course, the model was empirically derived which lent to its acceptance and perceived credibility. The enthusiasm displayed by managers when exposed to the model, and the model’s rapid diffusion rate among practitioners, suggests that the model’s content was perceived as accurate and useful.

The measurement model that expresses the conceptual framework strengthens Proposition 1. The latent factors of the change process model are highly interrelated. While high
levels of multicollinearity lends to the precision or reliability of the measurement model, it hurts the ability of various constructs to appear unique. Indeed, the measurement model displayed levels of unidimensionality lower than those viewed acceptable by scholars. However, note in Proposition 1 that we are proposing the elements of an assessment model. The model appears to harbor enough discriminatory power to provide useful diagnostic information during self-assessment.

**Proposition 4.2**: The higher the levels of change process variables, the higher the level of change achievement.

The CHANGE PROCESS variables are significantly related to CHANGE ACHIEVEMENT (Figure 4.1). We utilized a number of techniques to investigate this relationship. Due to our low sample-to-variable ratio, our regression analysis using summated scales provides the most reliable evidence of the relationship between the process and outcome variables. When we attempted to review the relationship at the individual variable level using canonical correlation analysis and structural equation modeling, we were faced with the low sample size problem and the potential for over-fitting.

A simple inspection of the correlation matrices (e.g., Table 4.22) suggests that each of the CHANGE PROCESS constructs appear related to CHANGE ACHIEVEMENT. However, our findings do suggest that certain constructs of CHANGE PROCESS may relate more strongly to CHANGE ACHIEVEMENT than others. One interesting finding is the relationship between CONTROL and CHANGE ACHIEVEMENT. The concept of managerial control has not been widely addressed in the context of change management. Our findings hint that perhaps more attention should be paid to this relationship both empirically and theoretically. CHANGE DETERMINATION, BEHAVIOR MANAGEMENT, and SKILL DEVELOPMENT (in about that order) were also found significantly related to CHANGE ACHIEVEMENT. Surprisingly, variables associated with communication processes (PROMOTION and SUCCESS SHARING)
were found to contribute relatively little to the relationship between CHANGE PROCESS and CHANGE ACHIEVEMENT.

4.4 Summary

In Chapters 3 and 4, we defined a model of change process and assessed its validity. The change process model is comprised of seven organizational or process constructs related to: determining the change to be implemented, providing organizational structure to support the change, developing the necessary skills and capabilities, promoting the change, sharing successes, managing behavior, and controlling the implementation. These variables of change process influence the outcomes construct related to change achievement.

The model has a high degree of conceptual validity when compared to the theoretical literature (content validity). The model also garners a high degree of acceptance among practitioners who “live” the model daily (face validity). The model as expressed in measurement form shows only mediocre ability to differentiate among the seven change process constructs (construct validity)—although this ability is improved as measurement items are removed to create a more parsimonious model. There is a relatively strong relationship between the change process variables, the predictors, and the outcomes variable (criterion-related or predictive validity).

4.4.1 Implications for managers

Our findings suggest that this change process model should be useful for organizational self-assessment. The content of the model reflects much of what is known about managing change. The model also appears to offer strong ability to predict outcomes. This means that managers can rightfully assume that higher scores on the survey questionnaire will translate into better change achievement.

The mediocre unidimensionality of the questionnaire items suggest that managers could be misled if they try to focus on individual question findings. For example, question 6.1 relating
to establishing individual roles related to the change, as it is currently expressed, may not be a unique indicator of the overall category of *BEHAVIOR MANAGEMENT*. That said, it is difficult to imagine a situation where the relatively low discriminatory power of certain survey items will really matter to managers. Indeed, we have seen the instrument in use numerous times and we have not yet encountered a situation where a survey question has misguided managers because of its low discriminant validity.

Are there variables that are missing from the model that should be included? Recall that even our best regression analyses suggested that only about half of the variance in change achievement is accounted for. If we were to add some questions, the additions would focus on change elements related to describing and configuring the actual organizational work that is affected by the change. The academic term for this is the “task.” In most organizational changes that we can think of, the task is changed in some manner. We like to think of the aggregate of all organizational tasks as something similar to Porter’s (1985) notion of the “value chain.” The value chain represents the configuration of all operational and support activities that result in the creation of valuable output by the organization. How the value chain is reconfigured as part of the change initiative under assessment is not clearly defined in the current model. We would add some items that make this crucial aspect of most change initiatives more prevalent in the survey.

Our findings also suggest that managerial resources and attention may be best allocated towards certain areas of the change process. In particular, activities related to controlling the change’s implementation—such as routine information gathering about the change’s status and taking effective corrective action when suggested by the information—are areas of high leverage for improving change achievement. Ironically, it is precisely these activities that are often found to be lacking in many change initiatives (see Troy 1994, Carr et al. 1996, and Buchanon, Claydon, and Doyle 1999 for representative data).
4.4.2 Implications for researchers

This study marks one of the rare occasions where a model of organizational change has been subjected to a rigorous evaluation of validity. Although the content of change models have been occasionally compared to the literature (e.g., Burke and Litwin 1992), or to empirical experience (e.g., Tushman and O’Reilley 1997), it is difficult to find published evaluations of change models expressed in measurement form.

In this study, we defined seven constructs related to the process of change. One unique feature is that the unit of analysis is the specific change event. Unlike other higher level models that attempt to capture organizational change in general (e.g., Nadler and Tushman 1980, Tichy 1983, Burke and Litwin 1992), the variables of this model are at a lower level of abstraction and tailored to represent important variables related to a specific change initiative. A ramification is that variables commonly observed as part of a general “structure” or “systems” categories in many scholarly models of change are disaggregated into more than one category. It could be argued that some of the CQM model’s constructs related to communication, managing behavior, and monitoring and control are all subsets of the more general “structure” or “systems” categories.

Specific variables of change process constitute both a strength and weakness of the CQM model. The more concrete variables get us closer to the actual change process and implementation than many theoretical models. Since implementation is chronically under-researched (Woodman 1989, Noble 1999), such a model should be helpful. However, since most of the model’s constructs stem from the same basic notion of “structure” and “systems”, they are highly correlated. Multicollinearity, as we’ve noted many time throughout this investigation, impedes our ability to quantitatively evaluate the validity of the model.

Our findings highlight certain aspects of change process that have rarely been emphasized. For example, the concept of managerial control in the context of change management has not been well examined in the change management literature, and the concept is
rarely specified as a substantial variable in most models of change. However, our findings suggest a strong relationship between managerial control activities and the achievement of change. Other constructs of the CQM model related to skills provision and managing individual behavior fall into this category to a lesser extent.

This investigation demonstrates again that models need not follow the conventional process typically laid forth by academics. The common process consists of careful deduction of a conceptual model from previous theory, followed by an expression of the model in measurement form that can then be verified. Not only was this investigation’s model derived by a group of practitioners, but it was also derived “backwards”—a survey instrument with measurement items preceded the development of a narrative describing the underlying theory. Of course, some researchers have confessed to using this process themselves, but not without apology (see Burke and Litwin 1992 for an example). It is our view that considerable opportunity exists for scholars who pay more attention to empirical observation and phenomenon as part of their formal processes for model development and evaluation.

4.4.3 Future work

This study generates more opportunities than answers. Although continued “flushing” of this model is warranted, we feel this change model is valid for research purposes. A number of research questions can be pursued using this model. For example, we can investigate the variables of change process from a temporal standpoint using the model. An interesting phenomenon that we witnessed repeatedly was that survey respondents could not answer the latter categories of the questionnaire—those categories related to SUCCESS SHARING, BEHAVIOR MANAGEMENT, and CONTROL. The reasons offered included “It’s too early to answer this category” or “We’ll be addressing these activities later.” In this investigation, we could not extract a path model that might have captured this sequence. But effort here should continue. What prompts some change managers to address variables of change process serially rather than in parallel?
It is difficult to imagine that all changes require attention to all variables of CHANGE PROCESS. An organizational restructuring likely requires a different critical set of variables than does a new product roll out. Burke and Litwin (1992) suggested that certain variables of change are more important to strategic change than for narrow, tactical changes. It may be possible to generate particular change profiles given the content of the change, and then compare them. For example, we might find a “high planning-low control” profile and a “high attention to people” profile that we could then compare or associate with other organizational variables.

We could also introduce antecedent and moderating variables to the model to generate more explanatory or predictive power. Variables that define contingencies and constraints are critical to meaningful organizational theory (Fry and Smith 1987, Whetten 1989). For example, the moderating effects of industry structure (Demsetz 1973, Porter 1980, Oster 1994) on the relationship between change process and change results could be assessed. Variables that help define sustainable competitive advantage, such as a change’s imitability (Barney 1991), could be inserted into the model. A change that is easily observable and imitated by rivals may reduce the relationship between CHANGE PROCESS and CHANGE ACHIEVEMENT, since competitors could compete away many of the change’s potential benefits. Other variables that might serve as useful context include those related to politics (Kotter 1982, Eisenhardt and Bourgeois 1988), factors related to organizational learning (Nevis et al. 1995), and the organization’s transfer climate (Bennett, Lehmood, and Frost 1999).

Another area that merits research consideration is the context in which this model was developed. The “study group,” where members from various organizations gather to solve a problem of mutual interest, constitutes another empirical phenomenon that is not well developed theoretically. The group of managers that developed the CQM model accomplished an astonishing amount of work in a relatively brief time period—while working regular jobs. The group’s deliverable was not only found useful to the respective organizations, but also found in this investigation to be competitive with many academically derived models. Although the
benefits of such mutual learning environments have been suggested (e.g., Burchill et al. 1993), this area remains largely untapped theoretically.
Chapter 5: Self-Assessment and Change Management

5.1 Introduction

As noted in Chapter 1, this study was motivated by two under-researched empirical phenomena. First, despite a gigantic volume of literature available on change management, managers continue to pursue technology for managing the implementation of planned change. We suggested that today’s manager is burdened with increased pressure to execute the organization’s strategy (see Charan and Colvin 1999 for an excellent empirical viewpoint here). Emphasis on execution has increased the value of implementation technology that works. Although considerable theoretical work has focused on processes for developing, and content of, planned change, particularly large-scale strategic change, scholars have contributed relatively little to the technology of change implementation. For the few contributions that have been made, practitioners often perceive academically derived work in change management as awkward and difficult to operationalize (Buchanon, Claydon, and Doyle 1999).

The second motivator was the phenomenon of self-assessment. The use of organizational self-assessment appears to be increasing—particularly as a means for evaluating and improving organizational processes and performance. The quality movement in particular appears to have motivated additional organizational interest in self-assessment (Ford and Evans 2000).

However, a strong theoretical framework for self-assessment and its relationship to performance is lacking. Few researchers have investigated the relationships between self-assessment and performance. Most of the extant evidence is anecdotal. For instance, practitioners have recounted a number of stories about the effects of Baldrige-based self-assessments on organizational performance (e.g., Herrington 1994, Meyers and Heller 1995, Markels 1999, Prybutok and Spink 1999). Most of these accounts suggest a positive relationship between self-assessment and performance. Few formal studies have been conducted. In a notable exception, Latham (1997) investigated the use of Baldrige-based self-assessments in a
military environment and suggested that the process produces positive organizational results under certain conditions.

A dearth of formal empirical research is perhaps expected, since little conceptual theory about self-assessment has been developed upon which testable hypotheses can be based. Literature exists on the general notion of organizational assessment (e.g., Lawler et al. 1980, Harrison and Shirom 1999). However, in the conventional organization assessment model, the role of the external consultant (often a scholar) is relatively large. The outside consultant is active in gathering, analyzing, and reporting the data to relatively passive clients within the organization.

Scholars have been slow to develop conceptual frameworks for the self-assessment situation. In self-assessment, the organization launches its own internal assessment with little or no outside help. Theorists have frequently acknowledged the self-assessment option (e.g., Tichy and Hornstein 1980) and have occasionally suggested conditions under which self-assessment might exist or be encouraged. Tichy and Hornstein (1980) proposed that self-assessment might be encouraged when the complexity of the assessment problem is low, when results are needed quickly, when minimum concern exists for contributing to scientific knowledge, and when there is a significant need for organizational commitment to the findings. Indeed, the organization’s active participation in assessment activities has been thought to facilitate adoption of any changes suggested by the assessment’s findings (Bennis, Benne, and Chin 1962, Beckhard 1969, Clark 1976).

Scholars have suggested that special characteristics and skills are required to conduct self-assessments. Harrison and Shirom (1999) suggested that an organization could conduct self-diagnosis if the organization was open to self-analysis and criticism, and if some members had the needed skills for gathering and interpreting the information. Beckhard (1975) suggested that organizations would require knowledge of the organization’s relationship to its external
environment and understanding of key organizational processes that influence change, such as power, reward systems, decision-making, information systems, and structural designs.

These theoretical comments are mostly fragmented, however. There has been little formal attempt to build a conceptual framework that integrates these views into a theory of self-assessment.

Initiating work on such a theoretical framework is the primary objective of this chapter. During the course of our investigation, we witnessed a number of self-assessment events, as organizations employed the change process model (the focal point of Chapters 3 and 4) to assess the progress or effectiveness of change initiatives in their organization. These field observations encouraged theorizing about the process of self-assessment.

In this chapter, we seek to identify salient theoretical categories and relationships that help answer one of three questions. First, what is the structure of self-assessment? It is difficult to advance theory too far without first defining the central phenomenon of interest. We seek to generate salient categories that represent the activities of self-assessment process. Second, what conditions encourage the use of self-assessment? Here, we are looking for organizational, environmental, and other contextual variables that suggest that organizations will use self-assessment. These contextual variables might help us understand why some organizations conduct self-assessments and others don’t. Third, what are the consequences of conducting self-assessments? As noted above, anecdotal evidence suggests a positive relationship between self-assessment and performance. How and why might such a relationship occur?

In this chapter, we derive more than one dozen propositions that can be applied towards building a theory of self-assessment in the context of change management. We combine these propositions into a provisional model of self-assessment that we hope will drive further theory development and testing (for a look ahead, see Figure 5.4).

Near the end of the chapter, we zoom in on one of the key conceptual elements of our self-assessment model: the concept of managerial control systems. Managerial control systems
provide some theoretical backing for the self-assessment model that we generate. It is our view that further crossing managerial control systems with research in change management should be fruitful, and we demonstrate how this can be so.

This chapter is organized as follows. §5.2 describes the research methodology of this chapter, which is conceptual and qualitative in nature. §5.3 provides a working definition of self-assessment to guide our investigation. §5.4 is a large section that describes key elements of the self-assessment process and important antecedent variables of self-assessment behavior. §5.5 elaborates the downstream consequences of self-assessment. §5.6 integrates the propositions generated in previous sections into a provisional model of self-assessment in the context of change management. §5.7 focuses on the notion of managerial control systems and its relationship to change management. §5.8 summarizes the implications of this chapter for both managers and researchers, and highlights opportunities for further research.

5.2 Methodology

5.2.1 Data sources
We draw from a number of data sources for the work in this chapter.

CQM study group activities. This researcher spent more than 18 months with the CQM study group that developed the CQM model. Extensive field notes were taken that captured observations, comments, and interviews. Primary data also resided in documents generated by the study group. By the end of this investigation, nearly 1000 pages of primary data related to the study group project had been accumulated.

Field observations of self-assessment activities. We witnessed 10 different self-assessment events, or cases (see Table 5.1). A variety of industry types (manufacturing, service, for-profit, non-profit) were captured by the cases. The general nature of the self-assessment event was the same in each case. Each case involved the assessment of an actual, pre-identified change initiative against the CQM model expressed in a survey format. Eight of these cases involved a
single organization where a group of organizational members, usually mid-to-upper level managers, gathered on-site for a self-assessment meeting. Two events involved multiple organizations in a “workshop” setting. In these workshops, multiple organizational groups evaluated change initiatives from their individual organizations, and then had the opportunity to share their findings with other organizations. Data obtained from these cases included observations, interviews, completed survey documents, and materials that supported the self-assessment events.

<table>
<thead>
<tr>
<th>Case</th>
<th>Organization Description</th>
<th>Change Initiative Being Assessed</th>
<th>Number of People Involved in Assessment</th>
<th>Composition of Assessment Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regional vocational school</td>
<td>Deployment of new mission &amp; values in organization</td>
<td>6</td>
<td>CEO &amp; direct reports</td>
</tr>
<tr>
<td>2</td>
<td>Auto parts manufacturer</td>
<td>Installation of ERP system.</td>
<td>8</td>
<td>CEO &amp; direct reports</td>
</tr>
<tr>
<td>3</td>
<td>Auto parts manufacturer</td>
<td>Implementing shared decision-making model in production depts</td>
<td>8</td>
<td>CEO &amp; direct reports</td>
</tr>
<tr>
<td>4</td>
<td>Auto parts manufacturer</td>
<td>Implementing shared decision-making model in production depts</td>
<td>12</td>
<td>Hourly workers</td>
</tr>
<tr>
<td>5</td>
<td>Auto parts manufacturer</td>
<td>Implementing shared decision-making model in production depts</td>
<td>6</td>
<td>Joint management-union steering team</td>
</tr>
<tr>
<td>6</td>
<td>Equipment distributor</td>
<td>Centralization of spare parts to corporate location</td>
<td>6</td>
<td>Mid-level managers from multiple functions</td>
</tr>
<tr>
<td>7</td>
<td>Architect/design firm</td>
<td>Implementation of Hoshin planning structure.</td>
<td>14</td>
<td>CEO and company officers</td>
</tr>
<tr>
<td>8</td>
<td>Metal castings &amp; components manufacturer</td>
<td>Strategic business unit restructuring</td>
<td>5</td>
<td>CEO &amp; direct reports</td>
</tr>
<tr>
<td>9</td>
<td>Multi-organization workshop—17 organizations total</td>
<td>Various</td>
<td>Average 3.2 per organization</td>
<td>Mid- to upper-level managers including 7 CEOs</td>
</tr>
<tr>
<td>10</td>
<td>Multi-organization workshop—8 organizations total</td>
<td>Various</td>
<td>Average 2.3 per organization</td>
<td>Mid- to upper-level managers</td>
</tr>
</tbody>
</table>

Data from CQM survey database. In this chapter, we periodically draw from the survey database that motivated our study of the change process measurement model in Chapter 4. Well-placed
quantitative data often provide an effective complement to a qualitative investigation (Strauss 1987, Miles and Huberman 1994, Yin 1994).

Visits to non-CQM organizations. CQM member organizations were nearly exclusive providers of the data for the categories noted above. Although the CQM consortium operates internationally and boasts over 120 members (including some of the largest companies in the world based on both sales and market value), we were sensitive to a potential bias from seeing everything through “CQM-colored glasses.” To combat this bias, we visited and interviewed managers in 4 non-CQM organizations. These organizations included a manufacturer of factory walkway equipment, a regional delivery service, a pharmacy benefits manager, and a computer equipment services firm. Of interest to us was how they managed and evaluated change in their organizations. Interviews, observations, and supporting documents were primary data sources.

Popular literature. Articles and books from the popular business press provided a source of secondary data. Magazine articles and book excerpts provide are often an underutilized and ignored source of data (Becker 1998). Over the course of this investigation, we read and marked up over 150 articles that described organizations in various change situations (see Appendix 3). Understanding these “change stories” provided another perspective outside the CQM realm. We also viewed it important to stay current on technological developments in change implementation and self-assessment—two areas were field innovations often precede academic development.

5.2.2 Research approach

We drew from a number of research methodologies developed by social science scholars for analyzing and generating theory from qualitative data. The guiding notion came from Glaser and Strauss’s (1967) seminal work for generating theory from empirical data and observation. While Glaser and Strauss’s grounded theory notion provides a useful conceptual framework, we found the methods presented by Strauss and Corbin (1990) and Miles and Huberman (1994) effective for operationalizing the development of theory from qualitative, empirical data in a systematic fashion. Other work that influenced our approach to data gathering and analysis were

Many qualitative researchers argue that theory building should be a purely inductive process. The researcher should focus solely on generating theory by inducing it from the data; previous theory should not enter the process. Indeed, it has been suggested that the researcher entering the field should have little or no prior bias, such as a favored theory derived from literature, that might taint the researcher’s objectivity (Strauss and Corbin 1990). The direction of the analysis is primarily an inductive one—from data to theory.

Although the grounded theory approach is intuitively appealing to some, inductive research is not the convention in organizational research. Most research is conducted according to the “scientific method.” The direction of the analysis using the scientific method is mostly deductive—moving from a hypothesis to data that verifies or falsifies the theory. The scientific method usually employs large sample sizes to exploit the power of statistical inference.

It is not our intention here to debate the merits of either approach. Countless papers document the debate—one that will never be resolved. Distinguishing the two approaches is pertinent, however, since data sources upon which this chapter is based are mostly qualitative (interviews, field observations, documents, etc.) from a relatively small number of cases. Since deductive/quantitative methods dominate the conventional research paradigm, a methodological “problem” is commonly perceived with qualitative approaches. The problem, usually raised by commentators or referees steeped in the tradition of large numbers hypothesis testing, is demonstrating rigor in a qualitative data analysis that is based on seemingly few samples.

Researchers with qualitative preferences have tried to overcome some of concerns about rigor by developing structured approaches for organizing and comparing qualitative data. Our
work has been particularly influenced by the techniques presented by Miles and Huberman (1994). These scholars, along with others (e.g., McGrath 1964, Strauss 1987) proposed that most qualitative data analysis alternates between inductive and deductive processes. A constant interplay exists between inducing plausible hypotheses from the data, and deductively testing them using empirical data, logical explanation, or connection with previous theory.

By constantly moving between data and hypotheses, the researcher leverages the data to conduct dozens or hundreds of “theoretical comparisons” (Glazer and Strauss 1967, Strauss 1987). Consider the context of our investigation, for example. One general theoretical category of interest to us is the “outcome” of the self-assessment event. In some cases that we observed, action items aimed at correcting problems with a change’s implementation were generated upon completion of the assessment. We might hypothesize that self-assessment of change initiatives results in the generation of activities to improve the change’s implementation. However, by comparing the outcome with other cases, we find that this hypothesis can be falsified. Some self-assessment events produced no observable items for action. The researcher can then return back to the data to ask why this might be so. Perhaps the action-no action result matches well to other theoretical categories, such as the level of authority or influence present in the assessment team, or the organization’s capacity for organizational learning. In any event, the researcher is constantly developing hypotheses, testing them against data, revising the hypotheses, retesting, and so forth.

The researcher keeps making theoretical comparisons until the marginal findings of additional comparisons are judged insignificant. What may be lost in large-numbers sampling for statistical purposes is frequently gained from pursuing differences revealed in theoretical comparisons. Pursuing these differences often unearths an array of variables and relationships that typify complex social systems. While theoretical models derived from quantitative methods usually strive for parsimony and variable reduction, theoretical models derived from qualitative methods usually seek to expand the number of variables and relationships in order to accurately
portray socially complex organizational situations. What usually emerges is a path or network diagram that specifies theoretical variables and their provisional relationships (the path diagram that resulted from our work appears in Figure 5.4).

The general research process that we utilized in this chapter is shown in Figure 5.1. The constant comparative method noted above is expressed in Figure 5.1 by the feedback loop between data and “memos.” The memo notion pervades qualitative research methodology. Some scholars have created an elaborate memo structure aimed at enhancing research organization and rigor (e.g., Miles and Huberman 1994). Our notion of a memo is less sophisticated. Any document that captures analysis of data constitutes a memo. A memo might contain reflective narrative about a model’s variables and relationships. A memo might also be a table or graph meant to organize data by conceptual category or to portray hypothesized relationships. The memo is the analytical driver of qualitative research (Strauss 1987). It represents the researcher’s work in progress—an expression of theory under development as it is teased out of data through theoretical comparisons and testing.

5.3 Defining Self-Assessment

We need a working definition of self-assessment in the change management context of this investigation. By the end of its activity, the CQM study group described self-assessment as a reflective activity where senior managers gather to diagnose change initiatives and to improve the organization’s processes for managing change (CQM Mobilization Training Manual Version 2.5, p.50). This working definition captures a number of salient dimensions that shape our perspective of self-assessment.

Self-assessment is a reflective activity, meaning that it is primarily related to the organization looking at itself. What separates self-assessment from literature-based views of organizational assessment (e.g., Lawler et al. 1980) is that the evaluation is done primarily by the organizational members with little or no outside assistance. Managers evaluate their
organization’s activities and behavior, and the evaluation serves as a mirror into which the organization can observe its own behavior and its connection to effectiveness.

**Figure 5.1: General Analytic Process Used in This Qualitative Research**

![General Analytic Process Used in This Qualitative Research](image)

Self-assessments are **diagnostic in nature**, and **often focus on a particular change initiative**. Information gleaned from self-assessment provides managers with an idea of what the problem is and some guidance on where to go to fix it. This makes the information more than simply a compilation of output measures (e.g., Kaplan and Norton 1992). Self-assessment provides information on where the problem is in the organizational change process. In order to
obtain this diagnostic information, managers usually reflect on a particular change initiative. Rather than a general assessment of “how we do change in general,” the self-assessment event is based on a reference change.

Although focused on a particular change initiative, self-assessments are process oriented. The diagnostic information provided by self-assessment event reveals change process variables that must be adjusted to enhance change achievement. The process orientation of self-assessment has been suggested in other contexts, such as the use of self-assessment to evaluate quality management practices (e.g., Ford and Evans 2000). Process levers can be adjusted to improve the implementation of the current change initiative. Longer term, these levers can be adjusted to improve the implementation of future change initiatives.

5.4 Self-Assessment Process and its Antecedents

In this section we examine aspects of the self-assessment process. What are the key variables that define the theoretical space of self-assessment? What are the antecedents of self-assessment process, i.e., under what conditions might we expect self-assessment to occur? Much of this effort is descriptive in nature. Ensuring a proper description of the phenomenon and teasing out key variables is necessary before advancing into the explanatory and predictive phases of building useful theory (Walton 1972).

First, we present some anecdotal accounts of some events that we observed in the field. These examples help highlight some of the salient properties of self-assessment and their theoretical ranges.

Example 1

A privately held manufacturer of automotive parts volunteered to participate in the “beta” test of the CQM study group’s survey instrument (which we examined in Chapters 3 and 4). The vice president of manufacturing and the quality director were both study group team members
and the CEO, an active participant in the local CQM chapter, had been designated as the chapter champion of the study group activity.

The study group had requested that senior management teams at all beta sites (there were 5 sites in total) complete the survey and then meet to discuss the results. The managers were asked to identify a particular change initiative, and then answer the survey questions in relationship to that change event. The vice president and quality director selected a current initiative, the implementation of an enterprise resource planning (ERP) system, for the management team to evaluate.

The quality director organized the senior staff meeting. The morning meeting took place at corporate headquarters in an executive conference room. The CEO and seven executives attended. Besides the quality director and the vice president of manufacturing, the CEO’s staff included the functional heads of other departments such as human resources, finance, and engineering. The quality director led the meeting. He asked the CEO to comment on the study group’s activity, and the CEO briefly endorsed the study group’s work and stated that he was looking forward to using “this important tool.” The quality director then distributed the survey, and provided additional background on how the study group’s work had resulted in this questionnaire. He then told the group that the survey questions were to be answered in relationship to current ERP implementation. For the next 30 to 40 minutes, the 8 members completed the questionnaire individually. The silence was occasionally broken when someone required clarification on the wording of some questions.

The completed surveys were given to an assistant for tabulation. It had been requested that each member put their name on their survey. Some members expressed reservations about this, but the quality director was able to obtain compliance stating, “We’re all friends here.” The analyst transferred each individual’s scores to a check sheet. The check sheet, a simple tool for visually organizing and reporting quantitative data (see Evans and Lindsay 1999 for an example) displayed the distribution of the individual responses for each question. Tabulation took about 40
minutes, whereby the meeting was reconvened. The quality director gave the completed surveys back to the individuals along with a copy of the tally sheet.

The quality director then led a discussion of the findings displayed on the check sheet starting with question 1.1 and working down through the questionnaire. Three types of response patterns tended to provoke discussion among the group. One type of response pattern was where all eight responses were tightly grouped towards the upper end of the scale. For example, the responses to question 2.1, which examined the extent to which resources had been provided for the change initiative, garnered all 4’s and 5’s (a high degree of systematic provision of resources) from the respondents, suggesting a relatively high level of performance and good agreement on the item. The comments here usually reflected satisfaction about the level of execution (“we’re doing a good job here”) or about how well the group agreed among themselves (“it looks like we’re all on the same page”). Discussion about this type of response pattern among the group was relatively brief—usually one minute or less.

Another attention-grabbing pattern were items where the variation among the 8 respondents was visibly large on the tally sheet. For example, responses to question 1.4, which examined the extent to which important stakeholders were involved during the change determination, ranged from 0 (I don’t know about any stakeholder consultation) to 5 (stakeholders were extremely involved). Individuals on the low and high ends either volunteered, or were asked to share, their rationale for their selected response. Sometimes this discussion appeared to help inform some people (“I didn’t know we did that”) while sometimes the discussion reflected concern about the exact status of the change initiative (“Where are we, really, concerning this issue?”). Discussions over survey items with this varied response pattern were relatively lengthy—5 minutes or more.

The third type of significant pattern was where all eight responses were tightly grouped at the low end of the scale. For example, responses to question 6.3, which examined the extent to which the reward system was reviewed and adjusted to support the change, received all 0’s and
1’s (little or no systematic evaluation of the reward system). The discussion tended to elicit responses about the group’s low level of execution (“Boy, we really stink here”). Time for discussing this type of response pattern varied considerably, from less than a minute to several minutes, usually depending on whether someone in the group thought some action should be taken to improve the performance level of the organizational variable reflected by the question.

Several times during the meeting, the CEO turned to this researcher, who was sitting away from the table and taking notes as an observer, and commented favorably about the usefulness of the survey (“You have a fine tool here.”). After the final question was discussed, the CEO asked the group what should be done for follow-up (“What does this group need to raise its awareness and score? [We need] to get information to us to get this team to a score of 4 or 5. Is there anything we need to address as result of this survey?”). Several members of the group expressed concern that they were unable to answer many of the survey questions as they pertained to ERP implementation. This particularly alarmed some members since the ERP installation was scheduled to “go live” within weeks. The CEO stepped over to the flip chart and suggested that each individual define his individual concerns. Rising emotions and tensions could be sensed in the room, as if individuals had been keeping some concerns to themselves and now were being asked if they wanted to release them. Since it was lunchtime, the group took a 20-minute break. The CEO asked the researcher if he had enough data to work with—he was politely asking the researcher to leave so that the group could discuss some sensitive issues.

At that point, the meeting had lasted about 3 hours. Subsequently, it was learned that CEO and his staff were meeting routinely to monitor the status of the ERP implementation—something that they had not been previously doing.

Example 2

Another beta test site was a privately owned commercial architect and design firm. Similar to the previous example, one of the study group members was the chief quality officer (CQO) of this firm and had “volunteered” her organization as a test site. The change selected for
evaluation was one that had been completely implemented at the firm—a Hoshin planning process had been installed over the past two years.

The firm’s “officers” were selected to complete the survey instrument. The officers included the CEO, his direct reports, and other influential managers. Prior to the meeting, the CQO distributed the survey to the officers and requested that they complete and return the questionnaire prior to the scheduled meeting date. Two of the officers returned the blank survey to the CQO, claiming that they were not involved in the Hoshin implementation and were not qualified to complete the survey. All other surveys, 12 in total, were returned prior to the meeting. The CQO used a tally sheet style similar to the previous example to capture the results, except that the results were posted on flip chart pages in the conference room rather than on 8½ by 11 handouts. Also, rather than generic tally marks, the initials of each individual were used to indicate their level of response on the scale. Although the CQO confided prior to the meeting that she was apprehensive about not preserving anonymity of the respondents, she decided to go ahead with this format. On the far right of each row of tallied responses, the mean response for the item was calculated.

The officers’ meeting was scheduled from 4 until 6 pm. In addition to the posted results of the survey, the CQO also posted a three item agenda for the meeting: 1) General feedback, 2) Detailed review of officer ratings: check for alignment, discuss variation in perception, 3) Consensus of where to focus for improvement.

The CQO led the meeting. Initially, she provided background on the study group’s activity. Unlike the previous example, the CEO gave no introductory remarks. A number of people had questions about how the survey was developed (“Where did these 7 categories come from?”). At end of the introductory discussion, the CQO initiated a question-by-question review of the survey results. At the outset she suggested that an important thing to look for was the degree of “alignment” among the group. When responses varied significantly, she said, “we want to talk about why some people answered a 5 while others answered a three.”
Similar to Example 1, the group’s discussion tended to reflect the three response patterns noted earlier. In addition, there was considerable discussion about the wording of the questions and differences in interpretation of certain questions and their various scale anchors. There was also some discussion about whether the Hoshin implementation was the appropriate change to evaluate here since it was already completed. Some thought that other changes that were just getting underway, such as a recent move towards an AutoCAD information system for designers and engineers, would be more appropriate for this evaluation.

The group was particularly enthusiastic about the response to question 7.4, which, in the beta version of the survey, reflected the degree to which positive results were obtained from the change. The scores on this item were relatively high, averaging 3.5 with a number of 5’s. This suggested to the group that the change had been successful. One officer remarked, “I think the entire assessment is summed up here.” Another officer agreed, adding, “This is all that matters.”

The meeting ended ten minutes early. At the end of the meeting, one officer suggested that he “could use this instrument tomorrow” with his project implementation teams. His thought was that each member of the team could be assigned one of the seven survey categories, and be responsible for ensuring that the change’s implementation proceeded so that these survey categories scored highly.

**Example 3**

As part of a visit to the local chapter, the CQM president spent some time at a member company that was experiencing some difficulties. One of CQM’s functions is to provide advising services to member organizations upon request; the president was highly regarded as an advisor and was frequently the CQM’s instrument for providing such diagnostic services. The company’s CEO had been struggling to reverse a three-year revenue decline in key market segments and to realize a major organizational restructuring that had been initiated.

The CQM president suggested that the survey instrument developed by the study group might be a useful tool for his visit with the company. Copies of the survey were sent to the CEO,
with instructions that the CEO and his staff complete the questionnaire beforehand. The findings
would be discussed during the president’s upcoming visit.

Upon his arrival, the CQM president spent the morning touring the corporate
headquarters and the manufacturing facility (the company manufactured metal castings and
components). He also spent time discussing various strategic initiatives, problems, and the firm’s
financial performance with the CEO and his executive staff. Over lunch in the executive
conference room, the results of the survey were presented and discussed. The survey results had
been compiled by one of the CEO’s reports. Results were summarized in a two-page handout in
tabular form. The rows of the table represented the questions from the survey; the columns
represented each individual’s response (from 0 to 5) to the question. At the far right, the mean
response to each question was included.

The CQM president opened with some remarks about the survey’s history and purpose.
The CEO had inscribed the change initiative to be evaluated as the company’s “organizational
and strategic readiness in 1999.” A few managers, including the CEO, noted that in retrospect,
this change may have been a bit vague and may have caused the five respondents to “not all be on
the same page.”

This did not deter the CQM president, as he preceded down through the survey, starting
with the results of category 1, Goal Setting. Rather than using a question-by-question review
approach, the president tended to look at the overall category scores, and then searched for
individual questions that may have influenced the overall category score. For example, after
asking for observations from the group and getting none to category 1, the president noted that
the scores in this category were relatively high and that the variation among respondents was
relatively low. He claimed, “When a score is 3 or higher, we feel this is a minimum level
necessary to be performing effectively. Many of the answers here are 4 or above. This category
appears quite strong. This would probably not be one that I’d invest resources in.”

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He continued down through the other seven categories of the survey. He noted other high scoring categories such as category four, Promotion (“This is one of your higher performing sections. It appears you communicated pretty well and there is consensus among most of you.”). He also highlighted low scoring items, such as some questions in category 6, Incentives and Rewards. For example, “[Question] 6.3 particularly sticks out with a two rating.” Some dialogue ensued among the executive team about how managerial incentives were developed by individual departments with little discussion or oversight by the senior management group.

In later categories of the survey, company managers began offering their analysis without the CQM president’s prompting. For example, the CEO moved the group into the findings of category 5, Sharing of Success Stories, by noting, “On 5.4, I don’t think we share success stories very well. I know we have a lot of time constraints, but we don’t do a great job of sharing.” His staff concurred, noting, for example, that a company newsletter designed to share successes had not been issued during the calendar year.

There were few indications that any of these discussions would lead to follow-up until the CQM president reviewed the findings of the eighth and final category of the survey. “From my view, 8.5 and 8.6 indicate that many here were not satisfied with the change. In particular, many were not satisfied with 8.6, the way the change was implemented. What I see here is a relationship between section two and section 8. These sections both score low (Researcher note: categories 2 and 8 had identical average scores of 2.2—the lowest mean category scores on the survey). The section two items that scored particularly low were those related to development of an action plan, steps, responsibilities, and timelines.”

Ensuing discussion revealed that, although overall business goals had been set for the last three fiscal years, management had not developed an integrated plan for how to achieve the desired financial results. The CQM president note, “What I thought I heard from people is that they look at the results measures and they are disappointing. Then I heard that there weren’t
The CEO agreed, “I go back to the 1999 strategic plan. We sat down and talked some of that through. Many individual goals sprang from that. But…we didn’t have a process in place. We didn’t step back and put it together strategically.”

The president responded, “Let me claim upfront that I know zero about your business. But what strikes me about the data as a whole is that this is a reasonable evaluation. Even though there is modest agreement, development of action plans was significantly lower than other responses. One problem that you have here relates to action plans and how the plans get implemented.”

The CQM president then proceeded to present some structured approaches for how to develop integrated strategic plans and controls for monitoring the plans’ implementation. Following the meeting, the company retained a consultant to provide further training and assistance with the development and implementation of a strategic plan.

It should be noted that the diagnostic portion of this meeting, where the president led a discussion of the survey findings, lasted approximately one hour. If fact, most of the discussion occurred between sandwich bites.

Example 4

One means by which the CQM attempts to differentiate itself from other groups is by promoting the value of societal networking. The belief is that learning is enhanced when individuals from different organizations gather to share their experiences. CQM chapters frequently arrange networking events to promote mutual learning.

One such network event arranged by the local CQM chapter was a “Mobilization Workshop.” Member and prospective organizations were invited to send management teams to a free-of-charge, off-site seminar that addressed how to assess an existing change initiative and how to plan for successful implementation of upcoming initiatives. Fifty-four managers from 17
organizations attended the half-day event, including 7 CEOs. The workshop was facilitated by the president of CQM—the same individual who facilitated the meeting in Example 3 above.

After some introduction about the importance of change, the president asked the senior representative from each organization in attendance to stand and say a few words about a change in their organization that went badly. Each representative was able to volunteer one. The topics of these changes ranged widely, from failed product rollouts to ill-defined implementations of a “TQM culture.”

The president then asked each organization to identify two changes. One change should be recently completed or active, and preferably one that is not going as well as desired. The other change should be one that is not yet implemented or in its early stages of implementation—“one that you’d like to hit a home run on.”

A structured process followed. The president introduced the participants to one of the eight survey categories, starting with category one, Goal Setting. Transparencies described the category’s content and the conceptual representations of the items and relationships that reflected the category’s domain. After about 15 minutes of lecture-like explanation, the president asked each individual to complete the portion of the CQM survey corresponding to the category that was just discussed. Each individual was to answer the questions relative to the struggling change initiative that should have been identified earlier by the organization. After about 10 minutes, the president asked for a show of hands as to how many 0’s, 1’s, 2’, etc. were marked for each question. He translated the counts into a histogram reflecting the distribution of responses.

The president suggested that the response scale represented an “increasingly more rigorous level of behavior. A ‘three’ should be considered a basic level of organizational performance, while ‘4’ should be considered competitive and ‘5’ superior.

He then asked each organizational team to reconvene, this time focusing on the “home run” change. He asked the groups to use the templates included in the course materials to generate plans for the home run change that would address the items in the survey category they
had just assessed for the unsuccessful change initiative. The plans, said the president, should consist of action item needed in order to execute the items in the survey category very well. These planning tables included spaces for the action item, person responsible, deadlines, and a measurable goal. Fifteen to twenty minutes were allocated to this activity.

Before moving to the next category, the president asked for reflections on the category the group had just completed. For example, when asked for reflections on category six (Incentives and Rewards), one manager responded, “We struggle especially with our middle managers. When should we do performance reviews, and how should reviews relate to rewards and recognition. Should it be public or private? Frequently we wind up reverting to just saying ‘Good job, thanks, we appreciate it.’” A manager from another organization commiserated, “We struggle with rewards, too. One problem we’ve had is making sure people are rewarded equally. For example, we’ve had people complain that he has a sweatshirt and I don’t.”

Others workshop participants often suggested remedies for these problems. Relative to the concerns about rewards expressed in the previous paragraph, some suggested informal thank-yous, giving presentations to senior managers to publicly recognize achievements, and involving middle management in a change’s rollout to remedy some of the reward-system problems.

This general sequence was repeated for each of the eight categories of the CQM survey instrument.

In concluding the workshop, the president noted that this survey could be used at various points in a change initiative. It could be used to plan an upcoming change, to diagnose problems with the change in progress, or to evaluate the effectiveness of a completed change. Each organization took with them an initial plan for implementing an upcoming change deemed important to the organization.

*Important categories of self-assessment process*

These examples highlight a number of important theoretical categories of the self-assessment process. A *model*, usually expressed in a questionnaire or other measurement
instrument, is used to provide a standard or basis for comparison. Because someone must provide
data, analyze data, and receive and discuss the findings of the self-assessment, there are different
**roles** that people must play in the self-assessment process. A specific change initiative is often
used as a frame of reference (a “**reference change**”) during the self-assessment. The **venue for**
**reporting and discussing the assessment findings**, such as the meetings noted in the examples
above, is an important part of the analytical process. Finally, there are important **outcomes or**
**consequences** of the self-assessment process. We elaborate these categories below.

5.4.1 Model used for self-assessment

The model used in self-assessment comprises a salient category (or variable) in a theory
of self-assessment. Hausser (1980) noted that all organizational assessments employ a model—
regardless of whether the model is explicit or not. The model helps determine what gets assessed.
In Chapters 3 and 4 we explored the content of the CQM change process model in considerable
detail. Here, we are more concerned about general dimensions of a self-assessment model. The
theorist might ask, “What separates a good self-assessment model from a bad one?” Or, “Can we
predict or explain why some self-assessment models are more readily adopted that others.” In
this section, we propose particular model properties and their dimensions that encourage self-
assessment.

**Conceptual domain.** One property of an assessment model relates to the model’s conceptual
domain. For example, there are models to assess motivation and satisfaction (Vroom 1964,
Alderfer 1972), group process and performance (Schein 1965, Smith 1973, Hackman and Morris
1975), leadership (Vroom and Yetton 1973), inter-group conflict (Filley 1975, Thomas 1976),
and organizational structure and design (Thompson 1967, Galbraith 1973)—among others. In our
investigation, the model used in self-assessment related to the domain of organizational
development and change. The CQM change model shares a domain with many scholarly models
of change, such as Nadler and Tushman’s congruence model (1980), Tichy’s change model
(1983), and the Burke-Litwin model (1992).
**Concreteness.** The degree to which a model is expressed in terms of tangible organizational activities, or concreteness, is another property of an assessment model. During the beta test phase of the CQM survey, respondents complained about the complex wording of the survey. “Too wordy,” “difficult to read,” “reads like an academic wrote it,” “don’t understand what is being asked” typified the complaints. After reviewing the complaints, the study group realized that the sentences in the survey were too long, and contained multi-syllable words and abstract terms that made navigation by busy managers difficult. For the next three months, the study group executed a major revision of the survey. Rather than changing the content, the focus of the re-write was adjusting the language to minimize lengthy sentences and abstract concepts. After the revision, no complaints were registered about the wording of the questionnaire.

For self-assessment, where organizational members primarily manage the assessment activities, the model must be at a low level of abstraction. A high-level model of overall organizational functioning, such as Lawrence and Lorsch’s (1967) open systems model, is too vague and abstract in its original to be useful for the self-assessment of an organizational change initiative. High-level academic models of organizational change must be distilled and expressed in concrete terms in order to be useful in the assessment of organizational activities. Burke (1995) provided a good example of how the conceptual Burke-Litwin model of organizational change was translated into a questionnaire that proved useful in an organizational assessment.

Indeed, the high level of abstraction in many off-the-shelf change models may have steered the CQM study group towards developing its own model. Although all study group members had been exposed to at least one change model offered on the open market, none of the change models was deemed useful enough to be adopted as-is by the group. A survey by Buchanan et al. (1999) suggested that many managers find much of the existing change management literature difficult to use in their organizations. Lack of concreteness likely contributes to the difficulty.
Another property of a self-assessment model relates its common language content—the degree to which the model reinforces the shared language of the model’s users. Early in the project, the study group needed to decide whether to base their change process model of the Seven Infrastructures framework developed by Shiba et al. (1993). The Seven Infrastructures model had been promoted as a useful change management framework in several CQM training courses and publications. Many member organizations were familiar with the term. The CQM president, who participated in most study group meetings during the first nine months, lobbied for the group to adopt the Seven Infrastructure headings for the survey categories. He suggested that the group make use of the equity that had been built in the Seven Infrastructures framework. He also argued that many “existence proofs” of the Seven Infrastructures model’s effectiveness were evident from his work with certain CQM member organizations that had employed the model in their change management efforts.

However, blindly adopting the Seven Infrastructures framework without considering change models outside the CQM paradigm concerned some study group members. Indeed, one charter member grew so frustrated about having the Seven Infrastructures model “pushed” on the group that he informally withdrew from the project. These concerns motivated the study group towards examining other change models and each member’s empirical experiences with change processes. Indeed, much of the group’s data gathering and analysis in the first three months of the project (see Chapter 3 for a description) can be viewed as comparing their experiences and beliefs against the change model suggested by the Seven Infrastructures framework.

The study group decided to adopt the Seven Infrastructure headings after an exercise that suggested all of the data that they had gathered about effective change processes could be categorized under one of the Seven Infrastructures headings. Upon seeing this, the group had no problem adopting the seven labels as titles to their survey categories. One study group member reasoned, “It really doesn’t make much difference to me what we call these categories. What
matters more is what questions are specified beneath each category. As long as we keep the
detailed data, we can label the categories any way we want.”

An effective self-assessment model includes wording that is familiar to the practitioner.
This is particularly true if the self-assessment model is developed inside an organization that
already has considerable equity invested in special terminology. Familiar terms embedded in a
new assessment tool provide a point of reference and familiarity for users that increases the
likelihood that the tool will be adopted.

*Diagnostic guidance.* A model for use in self-assessment provides some degree of diagnostic
guidance. Some would argue that a key feature of the CQM survey is that it provides quantitative
data about a change initiative. However, other performance measurement systems also provide
quantitative feedback on change progress. For example, a well-designed balanced scorecard
(Kaplan and Norton 1992) performance measurement system is capable of informing managers
about the effectiveness of strategic changes. While these systems inform managers about the
output or consequences of change, they provide considerably less guidance on where the
problems are or where to look for answers. Consider the experience of one chief quality officer
who was frustrated with the ineffectiveness of the measurement system used by her organization
to monitor progress towards their strategic goals:

> At each monthly meeting, most of our key indicators were flashing red at us—indicating that we
weren’t hitting our numbers. But the executive committee just looked at each other and asked,
‘What else can we do that we aren’t doing already?’ Our current system tells us that we have a
problem, but we have no idea of where to go in our processes to fix it.

The process→results orientation of the model studied here guides assessors towards
problem areas of change process. Low scores suggest a problem with some aspect of the change
process. The low scores urge managers to consider ways to improve the process in order to raise
the score. The inclusion of process variables improves the value of a model for organizational
self-assessment, since process data help managers diagnose problematic areas of the organization
that require adjustment in order to improve results.
Mode of expression. A self-assessment model can be expressed in a number of ways. The study group chose a questionnaire to be filled out by the assessors. This format is explicit, and provides quantitative data for use in analysis. A self-assessment model can also be expressed in narrative form. For example, quality management models, such as the ISO 9000 quality assurance standards or the Malcolm Baldrige Criteria for Performance Excellence (NIST 2000), are often presented in narrative form augmented by diagrams that help reinforce the relationships between the variables in the model. In these situations, the assessors must first gain understanding of the conceptual model before than can evaluate the process of interest. The people who conduct assessments using the narrative model as reference are often termed auditors or examiners, with some implication that they possess tacit knowledge or expertise about the model used to conduct the assessment.

What situations favor a model expressed in questionnaire form? Based on our observations of the study group project, an instrument-based expression is desirable when the assessors (the data gatherers) are managers. An early understanding among the study group was that the primary users of the survey would be the organization’s managers—possibly the senior management team. A questionnaire helps the managers grasp the conceptual model quickly and in concrete terms. In most of the assessment events we observed, the managers not only gathered the data, but they supplied it as well since they completed the questionnaires. This self-evaluation perhaps further enhances the desirability of the questionnaire format, since the concise format conserves management attention—a scarce organizational resource (Simon 1976).

Track record. A model with an established track record is more likely to be used by organizations for self-assessment than an unproven model. Track record can be established internally by positive experiences in early use. One CQM organization that participated in a “beta test” self-assessment using the survey perceived enough benefit in the initial exercise that the managers began discussing the date for their next assessment meeting. Establishing an internal track record has influenced the use of other self-assessment models as well. A number of
organizations began routine self-assessment programs using the Malcolm Baldrige Criteria for Performance Excellence after an initial positive experience (e.g., Meyers and Heller 1995).

Track record can also be established through promotion. Informally, promotion can occur through word-of-mouth, where someone learns of another’s success with using the model in casual conversation. More formally, track record can be promoted through mechanisms such as journal articles and seminars. After the study group model was developed, CQM conducted a number of no-charge workshops for member organizations that wanted to learn more about the self-assessment tool. As part of the workshop, members gained experience by assessing their own change initiatives and determining ways to better implement change. The track record of the Baldrige criteria as an effective self-assessment model has also been promoted. Each year, current Baldrige Award winners share their stories at “Quest for Excellence” conferences held around the country. In conferences and publications, Baldrige award winners have frequently cited the value gained from conducting self-assessments using the Criteria (e.g., Caravatta 1997, Blazey 1998). Promotions that demonstrate the model’s usefulness help establish its track record with users.

Affiliation. The other important property of the self-assessment model is its affiliation. Affiliation relates to the entities associated with the development and endorsement of the model. Affiliation lends credibility and confidence to the model. Although a model can be affiliated with an internal group, such as a particular department that conducts organizational assessments, credibility is usually enhanced when an external entity endorses it. The change process model developed by the study group was developed by CQM members and endorsed by the CQM organization. Such an affiliation greatly enhances the probability that CQM member organizations will try the model. However, organizations outside the CQM may perceive little value in the CQM affiliation. Indeed, when we visited non-CQM organizations as part of our “control group” due diligence, a discussion of the CQM change process model did little to excite non-members. None of them asked for more information or for a copy of the survey to try out.
In another example of affiliation, the Baldrige model (NIST 2000) is managed by two prominent organizations: National Institute of Standards and Technology (NIST) and the American Society for Quality (ASQ). This affiliation provides an impressive endorsement of the Baldrige model and is likely an important reason behind widespread use of the Criteria for self-assessment purposes.

A summary of the salient properties of a self-assessment model, and the particular dimensions of each property that encourage self-assessment using the model, appears in Table 5.2. The degree to which each property reflects these dimensions affects the value that an organization perceives in using the model for self-assessment. As the perceived value of the model increases, the probability increases that the organization will conduct a self-assessment using the model.

**Proposition 5.1:** *The higher perceived value of a model, the greater the use of self-assessment.*

<table>
<thead>
<tr>
<th>Property of the Model</th>
<th>Dimension of Property that Encourages Self-Assessment in Change Management Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual domain</td>
<td>Change management—developing and implementing change.</td>
</tr>
<tr>
<td>Concreteness</td>
<td>Vivid descriptions; few abstract concepts; simple wording.</td>
</tr>
<tr>
<td>Common language promotion</td>
<td>Utilizes Seven Infrastructure model widely diffused in CQM.</td>
</tr>
<tr>
<td>Diagnostic guidance</td>
<td>Low scores on change process variables suggest problematic areas.</td>
</tr>
<tr>
<td>Model of expression</td>
<td>Questionnaire.</td>
</tr>
<tr>
<td>Track record</td>
<td>Developing through internal trial use, external promotional events</td>
</tr>
<tr>
<td>Affiliation</td>
<td>Developed and endorsed by CQM—for use by member organizations</td>
</tr>
</tbody>
</table>

5.4.2 Self-assessment roles

In the literature (e.g., Lawler et al. 1980), three roles are played in organizational assessment. One role is simply termed the “organization.” The organization is the data provider—the source of the information that must be collected. The organization is usually the
target of the assessment—something about the organization needs to be evaluated. Another role is the “consultant,” who is responsible for using organizational theories and measurement tools to collect information about the organization and for analyzing the information. Finally, there is the “client,” who wants to learn something about the organization being assessed. The client usually marshals resources necessary to carry out the assessment.

Most scholarly work centers on a split-role model, where the consultant/analyst comes from an area outside the organization being assessed (Likert and Lippitt 1953, Barnes 1967, Walton 1969, Riecken 1972, Nunnally 1975, Shirom and Harrison 1999). Indeed, the consultant is often a scholar retained for his or her expertise. To some, sourcing the consultant from outside the organization or client group enhances the objectivity of the assessment. Since the external consultant has not been previously immersed in the organization under evaluation, the consultant’s analysis will be presumably less tainted or influenced by insiders.

The roles of the organization and client are frequently played by people from the same organization. Often, the client is a group of senior managers who want to know something about the workings of its organization. The senior managers rarely provide much of the data, however. Instead, the consultant usually must obtain data from somewhere else in the organization—usually at lower levels of the hierarchy. In the split-role model, the role of the organization is generally passive in nature. Employees from somewhere in the organization provide data to the consultant, but only upon request. The senior management client group idly awaits the consultant’s findings.

In Suchman’s (1971) view, a tradeoff existed when employing an external consultant. Outsiders were more objective but less sensitive to organization and likely to be less credible with recommendations. Insiders were potentially more informed and sensitive, but often blind to basic analytical assumptions—and prone to be less objective. Participation helps obtain the legitimization of, support for, and use of an assessment process (Thompson 1967, Van de Ven 1980).
The notion of self-assessment suggests a more active role of the organization in data collection and analysis. Essentially, the role of the consultant is internalized. This individual (or individuals) obtains or possesses knowledge of the organizational model to be used in the assessment. With the client’s blessing, the internal consultant gathers the necessary data from somewhere inside the organization. After the internal consultant collects the data and analyzes it, the analyst presents the findings to the client group. Except for the fact that the consultant comes from inside the organization, the work proceeds similarly to the split-role model.

An example of the internal consultant model is the process commonly reported by organizations that conduct self-assessments using the Malcolm Baldrige Criteria for Performance Excellence (see Myers and Heller 1995 for an example of this process). A group of internal “examiners” are trained to understand the Criteria’s performance management model that is to be used in the assessment. The examiners then gather data from the organization. The data can come to them—such as the data included in the “application report” required by the formal Baldrige Award process; or the examiners can go to the data—by stepping into the organization (a.k.a. a “site visit”) and making observations, conducting interviews, and collecting documents. The examiners conduct an analysis by comparing their findings to the Criteria’s management model. They then report their results to the client, usually the organization’s senior management group. The feedback is usually reported in written form (called the “feedback report”).

Baldrige-based self-assessments may not be totally self-contained within the organization. It is not unusual for an organization conducting “self” assessments to retain an outside consultant to assist in data gathering and analysis. The outsider, often an actual Baldrige examiner, might offer guidance in organizing the self-assessment program, or ongoing support in collecting or analyzing the data (see Herrington 1994, Blazey 1998 for examples). It is possible, therefore, for a fourth role to be played when organizational assessments become “self” assessments. That fourth role is the role of the advisor who provides guidance, expertise, or credibility not available inside the organization.
An alternative self-assessment structure was suggested by our fieldwork—a “convergent” model. In many of the self-assessment events that we observed, the three organizational assessment roles converged on the same organizational group—a group mid- to upper-level managers often headed by the CEO or other senior executive (Cases 1-4 and 7-10 in Table 5.3 below). The management group supplied the data for its own analysis by completing the questionnaire developed by the CQM study group. Someone from the management group with some computational skills, often the organization’s chief quality officer (CQO), compiled the raw data and summary reports. The anecdotes in Examples 1 and 2 above exemplify this situation.

In the convergent model, the consultant’s main job was to facilitate the analysis of the assessment data among the management group. Besides tabulating of the survey findings, the consultant/facilitator often organized a meeting for the group to discuss the findings, and to highlight points of discussion for the group.

Note that in some cases (cases 8, 9, and 10) the consultant/facilitator was an outsider. In these cases the outsider was either called in to help the organization diagnose pressing problems or the instructor in a multi-organization “workshop” event. Thus, there is some similarity between these events and the Baldrige-based model of bringing in outside experience to assist with the assessment.

However, even with an outsider present, organizational members in the self-assessments that we observed still played primary roles in data acquisition, reporting, and analysis. The outsider’s role was more passive, and helped guide the groups towards conducting a more effective self-diagnosis.

Two of the events, Cases 9 and 10 in Table 5.3, involved more than one organization. Case 9 was a “Mobilization Workshop” were CQM senior management teams were invited to learn about the Seven Infrastructures model and to use the questionnaire developed by the study group to self-assess a change initiative from their organizations. Case 10 was an exercise done as part of an executive training course. Here, managers were asked use the model to reflect on what
needed to be done back in their organizations to make better change. In both cases, discussion flowed not only between members of the same organization, but also between individuals from different organizations. Some organizations even offered remedies to other organizations’ problems. These group events still reflected the convergence model of self-assessment. The managers provided the organizational data and met to discuss the analysis.

**Table 5.3: Roles Played in Self-Assessment Events Witnessed**

<table>
<thead>
<tr>
<th>Case</th>
<th>Organization Description</th>
<th>Organization (The source of the data)</th>
<th>Consultant (Collects &amp; analyzes assessment data)</th>
<th>Client (Receives the results)</th>
<th>Outside Advisor Present?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regional vocational school</td>
<td>CEO &amp; staff</td>
<td>CQO collected data; CEO &amp; staff analyzed</td>
<td>CEO &amp; staff</td>
<td>no</td>
</tr>
<tr>
<td>2</td>
<td>Auto parts manufacturer</td>
<td>CEO &amp; staff</td>
<td>CQO collected data; CEO &amp; staff analyzed</td>
<td>CEO &amp; staff</td>
<td>no</td>
</tr>
<tr>
<td>3</td>
<td>Auto parts manufacturer</td>
<td>CEO &amp; staff</td>
<td>CQO collected data; CEO &amp; staff analyzed</td>
<td>CEO &amp; staff</td>
<td>no</td>
</tr>
<tr>
<td>4</td>
<td>Auto parts manufacturer</td>
<td>Hourly employees</td>
<td>CQO</td>
<td>Hourly employees</td>
<td>no</td>
</tr>
<tr>
<td>5</td>
<td>Auto parts manufacturer</td>
<td>Joint hourly-management steering group</td>
<td>CQO</td>
<td>Joint hourly-management steering group</td>
<td>no</td>
</tr>
<tr>
<td>6</td>
<td>Equipment distributor</td>
<td>Mid-level managers from multiple functions</td>
<td>CQO collected data; mid-level managers analyzed</td>
<td>Mid-level managers from multiple functions</td>
<td>no</td>
</tr>
<tr>
<td>7</td>
<td>Architect/design firm</td>
<td>CEO &amp; staff</td>
<td>CQO collected data; CEO &amp; staff analyzed</td>
<td>CEO &amp; staff</td>
<td>no</td>
</tr>
<tr>
<td>8</td>
<td>Metal castings &amp; components manufacturer</td>
<td>CEO &amp; staff</td>
<td>Member of executive staff collected data; CEO &amp; staff analyzed</td>
<td>CEO &amp; staff</td>
<td>yes</td>
</tr>
<tr>
<td>9</td>
<td>Multi-organization workshop—17 organizations total</td>
<td>Groups of mid- to upper-level managers including 7 CEOs</td>
<td>Each management group collected and analyzed its own data. Also gave and received analysis from other organizations.</td>
<td>Groups of mid- to upper-level managers including 7 CEOs</td>
<td>yes</td>
</tr>
<tr>
<td>10</td>
<td>Multi-organization workshop—8 organizations total</td>
<td>Mid- to upper-level managers.</td>
<td>Each management group collected and analyzed its own data. Also gave and received analysis from other organizations.</td>
<td>Mid- to upper-level managers.</td>
<td>yes</td>
</tr>
</tbody>
</table>

Noticeably less role convergence occurred in three cases (Cases 4, 5, and 6 in Table 5.3). In each of these cases there was also much less shared analysis of the findings of the assessment. In events 4 and 5, the consultant/facilitator actually never did formally present the findings of the assessment to the client. Rather, the assessment results were discussed informally among the
individuals who provided the survey data. In event 6, the mid-level managers were identified by the CQO to complete the survey instrument. At the meeting to discuss the results, many of the managers repeatedly noted that “I’m not qualified to answer this question” and “I don’t know what we did regarding this issue.” There was little discussion of the actual results of the survey.

Role convergence usually involves upper-level personnel in the organization. Senior managers want to know something about the workings of their organization (the client role), so they collect data from key representatives of the organization—themselves (the organization role)—and then convene a meeting to analyze the findings (the consultant/facilitator role). Sometimes, an outsider expert assists in interpretation and analysis (the advisor role).

Involvement of senior level personnel appears to influence the amount of activity dedicated to analyzing the data. Table 5.4 shows that the time associated with analytical discussions of the assessment findings was considerably higher for upper management groups than for lower level groups.

Table 5.4: Average Length of Self-Assessment Discussion Meeting

<table>
<thead>
<tr>
<th>Primary organizational level of personnel in meeting</th>
<th>Number of meetings observed</th>
<th>Average meeting time spent in discussion of findings (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>6</td>
<td>2.0</td>
</tr>
<tr>
<td>Middle</td>
<td>3</td>
<td>0.8</td>
</tr>
<tr>
<td>Lower</td>
<td>1</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Proposition 5.2: The more that upper-level personnel are involved in data collection and analysis, the greater the use of self-assessment process.

Nearly all organizations represented in the cases were CQM members. CQM membership is a selective process. Interested organizations submit an application that is reviewed by peers and CQM administrators for the organization’s commitment to continuous improvement. Particularly important in the review process is the demonstrated commitment of the prospect’s CEO to become involved and to contribute to core CQM activities of mutual learning and societal networking. Member organizations are also reviewed for their potential
contribution to the advancement of the overall chapter’s improvement. Lack of senior management commitment is the top reason for the rejection of an application for membership.

This selection process appears to admit organizations that exhibit characteristics of learning organizations. Nevis et al. (1995) identified a number of firm-specific factors that facilitate organizational learning, including a propensity to scan the environment for ideas, a concern for measurement, willingness to experiment, a climate of openness, and involved leadership. From the description of the CQM membership review process described above, it is easy to posit that applicants that do not possess organizational learning factors skills to a significant degree tend to be screened from the CQM organization.

Our observations during our site visits suggested that many of these learning factors were present in most CQM member organizations. A large amount of posted data, such as balanced scorecard performance measurement systems suggested a concern for measurement. Many of the case organizations contributed people to the study group effort, signaling a propensity to look outside the organizational for new ideas. Simply the willingness to try out the newly developed survey instrument and self-assessment process signaled tendency to experiment. The discussions in most of the meetings, particularly those of upper managers, were open and frank, with people often questioning current organizational policies and past decisions.

**Proposition 5.3:** The more the organization exhibits organizational learning tendencies, the greater the use of self-assessment.

We should also expect organizational learning factors to influence the degree to which senior managers are involved in data collection and analysis. Searching for good ideas outside the organization and the willingness to experiment will encourage senior management teams to try a new questionnaire and procedure that is suggested by an outside entity. The appetite for measurement is satisfied by the survey’s quantitative output. A climate of openness and involved leadership is important when the group gathers to discuss the findings of the assessment, since the discussion usually centers around current problems and how to improve them.
**Proposition 5.4:** The more the organization exhibits organizational learning factors the greater the involvement of upper management.

### 5.4.3 The reference change

A distinguishing feature of the CQM process model is that it prompts for an evaluation of the change process in light of a specific change initiative underway in the organization. There are a number of salient theoretical properties of this “reference change.”

**Implementation life-cycle status.** One dimension relates to the current status of the change. A change can be evaluated during one of three stages in the change’s implementation cycle: early (the change has not been implemented or implementation is in its early stages), during (the change is being implemented currently), after (the change has already been implemented).

All three of these life cycle phases were observed in the reference changes we observed (see Table 5.5). Case 3 involved the assessment of a new high performance work team decision-making process that was just beginning implementation (the early stage). Case 1 involved the deployment of the new mission & values statement whose implementation had been initiated approximately 6 months prior to the assessment (the during stage). Case 7 involved assessing the completed implementation of a Hoshin planning system that had been completely installed over a two-year period (the after stage).

The general orientation or focus of the self-assessment differed depending on where the reference change was in the implementation life cycle. An early life cycle change, such Case 3’s shared decision model implementation, corresponded to a planning orientation. The executive team that assembled to discuss the survey results usually found many of the scores low and some entire categories of the change unconsidered. Assigning responsibilities was a common objective of the discussion in these sessions.

If the reference change was assessed during implementation, a compare-and-control orientation dominated. For example, during the assessment of Case 8, it was found activities related to category 2, Organization Setting, were weakly executed. Ensuing discussion centered
around potential actions to improve the development of action plans and timelines necessary to improve performance in the Organization Setting category.

Table 5.5: Reference Changes Observed in Self-Assessment Events

<table>
<thead>
<tr>
<th>Case</th>
<th>Organization description</th>
<th>Reference change</th>
<th>Stage in implementation life cycle</th>
<th>Scope of change</th>
<th>Definability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regional vocational school</td>
<td>Deployment of new mission &amp; values in organization</td>
<td>During</td>
<td>Strategic</td>
<td>Fuzzy</td>
</tr>
<tr>
<td>2</td>
<td>Auto parts manufacturer</td>
<td>Installation of ERP system.</td>
<td>During</td>
<td>Towards strategic</td>
<td>Project</td>
</tr>
<tr>
<td>3</td>
<td>Auto parts manufacturer</td>
<td>Implementing shared decision-making model in production depts</td>
<td>Early</td>
<td>Strategic</td>
<td>Fuzzy</td>
</tr>
<tr>
<td>4</td>
<td>Auto parts manufacturer</td>
<td>Implementing shared decision-making model in production depts</td>
<td>Early</td>
<td>Strategic</td>
<td>Fuzzy</td>
</tr>
<tr>
<td>5</td>
<td>Auto parts manufacturer</td>
<td>Implementing shared decision-making model in production depts</td>
<td>Early</td>
<td>Strategic</td>
<td>Fuzzy</td>
</tr>
<tr>
<td>6</td>
<td>Equipment distributor</td>
<td>Centralization of spare parts to corporate location.</td>
<td>After</td>
<td>Incremental</td>
<td>Project</td>
</tr>
<tr>
<td>7</td>
<td>Architect/design firm</td>
<td>Implementation of Hoshin planning structure.</td>
<td>After</td>
<td>Strategic</td>
<td>Project</td>
</tr>
<tr>
<td>8</td>
<td>Metal castings &amp; components manufacturer</td>
<td>Strategic business unit restructuring.</td>
<td>During</td>
<td>Strategic</td>
<td>Fuzzy</td>
</tr>
<tr>
<td>9</td>
<td>Multi-organization workshop—17 organizations total</td>
<td>Various</td>
<td>All</td>
<td>Towards strategic</td>
<td>Both</td>
</tr>
<tr>
<td>10</td>
<td>Multi-organization workshop-8 organizations total</td>
<td>Various</td>
<td>During</td>
<td>Towards strategic</td>
<td>Both</td>
</tr>
</tbody>
</table>

If the reference change was assessed after implementation was completed, then a reflective orientation dominated. In many cases, the assessor remarked that it was often difficult to stay focused on a particular change while they completed the questionnaire. Rather than answering the questions relative to the reference change, the respondents found themselves answering the questions with regard to “How we do change in general.” The discussion was oriented towards how the process could be improved to better implement future changes.
Table 5.6 summarizes the relationship between the status of the reference change in the implementation life cycle, and the orientation of the self-assessment discussion.

Table 5.6: Orientation of Self-Assessment Meeting Related to Implementation Life Cycle

<table>
<thead>
<tr>
<th>Stage in Implementation Life Cycle of Reference Change</th>
<th>Orientation of Self-Assessment Meeting</th>
<th>Representative Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>Planning</td>
<td>Assigning responsibilities. Developing action plans. Insuring coverage of each survey category.</td>
</tr>
<tr>
<td>During</td>
<td>Compare-and-control</td>
<td>Looking for low scoring items or categories. Asking how the scores can be made better. Asking why the scores are so low. Obtaining corrective action ideas.</td>
</tr>
<tr>
<td>After</td>
<td>Reflective</td>
<td>Asking how the change process can be improved for the future. Asking what the organization should have done differently. Resolving to use the change model for upcoming initiatives.</td>
</tr>
</tbody>
</table>

Scope and definability. Scope and definability might be considered two separate theoretical properties but in practice they are often related. A change’s scope constitutes the degree to which the entire organization is impacted by the change. Nadler and Tushman (1989) labeled changes towards the high end of the scope continuum as “strategic” and changes on the low end as “incremental.” Strategic changes usually require reconfiguring most of the organization. They are associated with fundamental changes in business direction, power, and culture. The reference change in Case 8, a major restructuring of business units, is an example of a strategic change. Incremental changes often involve adjusting some small portion of the organization for better performance. Moving spare parts distribution to a central corporate location, the reference change in Case 6, is an example of an incremental change.

Most self-assessments that we observed involved changes that were strategic in scope. We view this as no accident. It is likely that self-assessment—particularly of the type that
involve senior-level organizational personnel—may be most appropriate for changes that matter most to the organization. Managers usually sacrificed 2-4 hours to conduct the self-assessments that we observed. In terms of compensation alone, the cost of these meetings easily ran into the thousands of dollars. More importantly, however, is the time and attention management dedicated to the self-assessment activity at the expense of other opportunities. Management attention is a scarce organizational resource that often constrains an organization’s ability to exploit opportunity (Simon 1976). Self-assessment activity involving senior managers will likely be limited to those change initiatives with large organizational impact.

Definability is the degree to which a change can be assigned a beginning and end. Definability can also be viewed in terms of how easy it is to measure effective implementation. A definable change resembles the conceptual notion of a project. Projects usually have an observable endpoint (Turner 1993). A defined set of responsibilities and tasks often accompany a project-oriented change; key measures of success are often defined in terms of cost, quality, and time (Grundy 1998). Case 2, where the reference change related to the installation of an ERP system, resembled a project change. On the opposite end of the spectrum are changes that are not easily definable. The endpoint of such a “fuzzy” change is difficult to determine; it is often difficult to derive key success factors associated with a fuzzy change. Defining and measuring cultural changes, for example, is notoriously difficult (Simons 1995). Deployment of a new mission statement and set of organizational values (Case 1) or installing a shared decision model among the workforce (Cases 3-5) were fuzzy changes that we observed.

Thus, the definability of the reference changes we observed was mixed between the project and fuzzy categories. For most of the events involving project changes, it appeared that the self-assessment event duplicated to some degree the activities being done elsewhere in the organization. For example, during Case 2 where the implementation of an ERP system was being assessed, the senior management committee spoke frequently about having the ERP project team “come up” to the senior management group and provide information about some of the items on
the questionnaire that the senior management team could not answer. During Case 6, which was a post implementation assessment of a project to centralize spare parts distribution, the managers doing the assessment frequently suggested that the project managers charged with implementing the initiative would be better positioned to answer the survey questions.

The point is that for changes that resemble a project, a management structure already exists in many organizations that might be superior to the self-assessment process observed here. The self-assessment process may be redundant and overkill when similar information may be transmitted in project progress meetings. Further, since the critical events and outcomes of a project are often identified and monitored, considerable data may already exist with which to assess the project’s implementation progress. The additional quantitative data provided by the self-assessment questionnaire may add only incremental value to many change initiatives that resemble a project.

On the other hand, fuzzy changes, such as Case 1’s implementation of a revised mission statement and organizational values may not be easily managed as a project. Changes that address “soft” issues in the organization, such as culture, are notoriously difficult to measure (Simons 1995). Without measurement, such changes are not easily managed using conventional project structure. Indeed, none of the fuzzy changes that were assessed in our cases appeared to have a pre-ordained project management structure. Rather, it appeared that the self-assessment questionnaire was providing some of the first data on the fuzzy change’s implementation. These metrics suddenly allowed managers to gauge the change’s progress, and helped form the basis for determining whether corrective action was necessary. Such data is crucial to the functioning of any diagnostic managerial control system (e.g., Merchant 1985). The self-assessment process appears to provide data for diagnostic managerial control that would otherwise be lacking.

Although our categories of scope and definability may be separate theoretical constructs, they are related in practice. Changes that are large in scope (those that are strategic in nature) are usually harder to define (they’re fuzzier). Indeed, Grundy (1998) proposed that strategic changes,
such as an organizational turnaround, are not easily manageable *until* they are broken down into smaller chunks that are definable and measurable as individual projects (see Figure 2.1).

Comments from CEOs further validate these claims. At one self-assessment meeting, the CEO and his staff engaged in the following discussion:

CEO: We make a lot of changes. What we’re talking about here is the precious 1, 2, 3 major change initiatives that WE can drive. Strategic changes. Especially if it’s cross grain, then it better get here in a hurry for us to evaluate.

Executive 1: I think any project of significance should come to us for review.

CEO: You’re talking about projects while I’m talking of major change initiatives. I’m not talking about any project here.

Executive 2: [Picks up the coffee cup and sets it down about 12 inches away]. Let’s say the change is moving this coffee cup from here to there. In moving the cup, this checklist might be useful for those six people somewhere in our company involved in movement. But for us, the checklist should be used for major changes. Which changes should we be involved with?

[The group identifies some past initiatives that appeared to fit the strategic category, such as implementing a balanced scorecard approach for organizational performance measurement, and installing a QS 9000 compliant quality assurance system]

Executive 3: Yep, we could have used this survey for those.

Executive 4: One problem I think we have is that we have some lower level people making these important decisions because they don’t think we need to know. And the decisions wind up backfiring.

CEO: If we have a communication link in place, then things will go more smoothly.

Consider also the view of the CEO whose executive staff evaluated the reference change in Case 7, the implementation of a Hoshin planning process. Near the end of the self-assessment meeting, someone in the group asked what type of changes would be most appropriate for the process the group had just gone through. “I thought about that,” the CEO replied. “At first I thought we should be evaluating a smaller, more finite change, like the (geographic) move from [old corporate headquarter location] to [new headquarters location]. But most changes I thought fit here were just like this one. There just aren’t that many changes that fit into this category.”

The self-assessment process appears most suited for strategic changes that are difficult to define. Large-scope change is difficult to implement (Nadler and Tushman 1989). Without the self-assessment process, it is more difficult to accurately adjust the change process for effective
change achievement. As well, changes that are ill-defined are difficult to measure; without the quantification that the self-assessment survey, little information may be available to help managers judge whether implementation of the change initiative is on track. The problems caused by strategic, ill-defined changes suggest that self-assessment using a quantitative expression of the change process model can be used effectively in these situations.

**Proposition 5.5:** The more strategic and ill-defined the change, the harder it is to accurately adjust change process for effective change achievement.

**Proposition 5.6:** The more strategic and ill-defined the change, the less information provided for managers to judge whether the implementation is on-track.

**Proposition 5.7:** The more strategic and ill-defined the change, the greater the use of self-assessment.

5.4.4 Venue for reporting and discussing

Scholars frequently frame the assessment process as a stream of temporal events involving the organization, the consultant, and the client (Kahn and Mann 1952, Argyris 1958, Junker 1960, Schatzman and Strauss 1973). Lawler et al. (1980: 497) portrayed the assessment process as divided into three temporal groups of activities. Pre-collection activities consisted of entry by the consultant/facilitator and planning the data collection. Formal data collection activities followed. Finally, there were the post-collection activities of analysis, reporting, data use, and termination. For comparison, Van de Ven (1980) proposed a six-phase process model for conducting organizational assessment: evaluation prerequisites, goal exploration, criteria development, evaluation design, evaluation implementation, data analysis, feedback, and evaluation.

If a manager fills out the change process questionnaire, has a self-assessment taken place? Not likely. To explain, consider a local restaurant company that volunteered to complete the survey (we were collecting data to evaluate the measurement model in Chapter 4). The CEO and four of his executive staff completed the survey using the roll out of a new menu item as the reference change. Each individual completed the survey at his or her convenience and returned
them to the marketing director, who then turned the completed questionnaires over to us. The important thing to note is that the individuals who completed the survey never saw a summary of the results. Perhaps more importantly, the individuals never met to discuss the results as a group—at least not formally. Although completing the survey independently may enlighten some individuals, we suggest that value of such enlightenment is rarely significant.

We propose that the defining or critical feature of the self-assessment process is the venue for reporting and discussing the findings. If the reporting and discussion venue is not effective, then the self-assessment process’s ability to provide diagnostic guidance about how to better achieve change is greatly reduced.

There are a number of ways to report the assessment findings. In the conventional organizational assessment model (e.g., Lawler et al 1980), the consultant (an outsider) analyzed the data gathered from the organization and prepared a report for the client (usually the organization’s management). Less has been articulated about how this report is used. Scholars have observed that feeding assessment data back to the organization does appear to affect performance (Nadler 1976). However, the literature suggests that managers have trouble interpreting findings of organizational assessments run by outside consultants, and frequently must retain the consultant to help them understand the findings (for example, see the cases described by Goodstein and Burke 1994, and Beer and Eisenstat 1996).

In the case of self-assessment, the most widely cited venue for reporting assessment findings is a written document. In the context of Baldrige-based self-assessments, the document is commonly termed the “feedback report.” The feedback report contains the organization’s strengths and weaknesses as identified by the consultants (“examiners” in the language of the Baldrige process) after the consultants compared the data gathered from the organization against the organizational model (the Baldrige criteria) used in the assessment (for some empirical examples, see Myers and Heller 1995, Caravatta 1997). Latham’s (1997) study suggested that the feedback report was important in driving any type of follow-up from Baldrige-based self-
assessments. Precisely how the feedback report is linked to follow-up action and subsequent organizational improvement in the Baldrige context is not well understood and certainly a target for future research.

The fieldwork in our investigation revealed a different reporting and discussion structure—a structure where the link between reporting and follow-up was more observable. In each of the ten self-assessments that we witnessed, a meeting was conducted to discuss the findings obtained from the CQM survey. Eight of these meetings were single organization events, where groups of anywhere from 5 to 15 individuals gathered to discuss the findings obtained from completing the survey. Two events involved multiple organizations. One or more individuals from an organization (commonly 2 to 3 per organization) completed the questionnaire, and then the findings were shared among the group. The four anecdotal examples cited earlier in this chapter capture both the single- and multi-group scenarios.

In some cases the questionnaires were completed and the data were compiled prior to the meeting. In other cases, the data where collected during the first part of the meeting and then discussed in the second part of the meeting after the data where compiled. In either case, the consultant/facilitator usually managed data collection and compilation activities.

In the single-organization cases, the self-assessment meeting was always held in a conference room, frequently an executive conference room since the group was often the senior staff. The multi-organization events took place in seminar rooms or classrooms where participants were seated around team tables—usually 5 or 6 people to a table.

The compiled data were reported in a number of formats. The most common way to present the data was using a check sheet (See Figure 5.2). The appealing features of the check sheet format appeared to be 1) it was easy and fast to develop, and 2) it readily displayed the information of interest. Indeed, the two key quantitative dimensions of the results that interested group members most were the central tendency (“Boy, we really scored low here”) and the spread (“We’re all over the map on this one”). Both of these quantitative dimensions are effectively
communicated by the check sheet format. Statistics (commonly the mean) were calculated in only two events. In both of these cases the surveys were collected prior to the meeting, which presumably provided the analyst with extra time to calculate the statistics.

**Figure 5.2: Example of Check Sheet Format Commonly Used to Present Survey Data**

(6 Imaginary Survey Respondents)

<table>
<thead>
<tr>
<th>Question</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The meeting was scheduled and led by the individual playing the role of the consultant facilitator. This person was often the organization’s CQO. If an advisor was retained, then this individual would lead the discussion. For simplicity, in the upcoming paragraphs, we will commonly refer to the person who led the discussion during the self-assessment meeting as the “facilitator.”

At some single site meetings, even where the surveys were completed before the meeting, the facilitator asked each individual at the meeting to call out their score for a particular question. The facilitator then penned a tally mark under the appropriate column on the check sheet. Matching the voice to the tally mark served to make the respondent more accountable to the group. It was easy to note some pressure (and some occasional shirking) in the room when people were calling out responses. We observed one instance where the CEO who had recorded his score as a 5 on the written survey document, called out a lower score to the facilitator to fall more in-line with his staff.

The self-assessment meetings that we observed tended to follow the same general sequence. First, the facilitator opened the meeting by explaining the objectives of the meeting, some background on the survey process developed by the CQM study group, and the reference change being evaluated. If this was a senior management group, the CEO often voiced his
support for the effort. Sometimes, the group asked some questions during this opening phase as well—particularly if they had completed the survey prior to this meeting and were confused about the content or presentation of the questionnaire.

If the surveys were not completed and compiled prior to the meeting, then the next phase related to data collection. When the surveys needed to be completed and compiled, about 1 hour was required for the individual to complete the survey and then transfer the results onto a check sheet. At some meetings, the participants had already completed their surveys, but the facilitator asked people to call out their responses individually, and then the facilitator subsequently marked the tally on a flip chart-sized check sheet.

The most significant phase of the self-assessment meeting occurred once the data were summarized and reported to the group—either on flip charts hanging about the meeting room or on paper documents handed out to the participants. The group commenced a discussion about the results. Usually, this discussion was sequential—i.e., question-by-question starting with the items in category 1 of the survey. The discussion was driven by the patterns observed in the data—particularly if the data were presented in the check sheet format similar to Figure 5.2.

Three patterns generated discussion. The first pattern resembled the one portrayed by the responses to 1.1 in Figure 5.2. In this example, the scores were fairly homogenous and grouped towards the upper end of the scale. The discussion around this pattern was usually a confirmatory one. Some representative remarks included:

“We’re doing pretty well here.”
“That’s what I call execution.”
“This fits my view of the situation.”

We rarely observed much diagnostic component to this discussion. For example, no one asked what exactly it was that the organization was doing correctly that merited the high scores. Discussion for the high-end, tightly grouped pattern was the briefest of all discussion categories.

The second pattern that precipitated discussion is represented by the responses to question 1.2 in Figure 5.2. Here, the responses were tightly grouped, but the grouping was
towards the low end of the scale. The discussion about this pattern generated a greater variety of themes. One category of comments involved observations of overall disgust about the level of the item (e.g., “We really stink here.”). Other themes were more reflective in nature. In some cases, individuals recounted the activities that related to the low score. Consider this discussion between the CEO of a regional vocational school and his staff when they observed the tightly grouped, low score to the survey question probing the degree to which data were used to determine the change objective:

CEO: If you talk about something that has data with it, then you can say how far you’ve gone. It gets muddy if you get immersed in a topic like this one that does not have a lot of raw data. In my mind, we looked at a lot of critical dimensions, but we had no hard data that told us to shift decision making to the operating level.

Executive 1: It wasn’t totally intuitive either. We read books, listened to others…

Executive 2: Yes, we did a LOT of listening and observing. Going with the gut. Informal instead of formal analysis.

In some cases, individuals questioned the need to score more highly. For example, the next response from the discussion above came from another executive:

Executive 3: Do you think quantitative perceptions will help us do better things for kids? We’re not making widgets here but producing better human beings. Is that an issue here?

Indeed, questioning the appropriateness of an item, usually in terms of the context of the organization or the change event was not uncommon. Often, groups agreed that the tightly-grouped low score was due to it being too early in the change process to have dealt with it (e.g., “It’s too early to be addressing that.”) We heard this response most for the later categories of the survey, particularly category 7 dealing with the CONTROL construct.

Considerable pent up emotion could be sensed in some responses, as if concerns about the change’s implementation had been building for a while. Consider this discussion about the low scores on some items from category 6 (BEHAVIOR MANAGEMENT) of the survey:

Executive 1: Everyone had performance goals before the strategic change but I’m not sure we reconsidered them once the change was being implemented.

Executive 2: We have a management bonus plan tied to 70% profit, 30% personal goals. Some probably were not retooled when the change was in place.
Advisor: Do you meet to discuss these?

CEO: Probably not enough. We have a two-month financial review and a quote review each month, but nothing that directly addresses rewards.

Executive 3: You know, we don’t share thoughts much as a team. I’ve tried to integrate our core values into my people’s performance ratings and quarterly performance reviews. I tell them how they are doing versus the numbers. We do base rewards on merit, goals, and objectives. But I don’t think some people here believe in doing that. In fact, I really don’t know how others do it. And that bothers me.

Executive 1: It’s always been different among our groups. Right or wrong, it’s just different.

CEO: I think we’re better at evaluating at the shop floor than perhaps at the professional levels. That is something I’ve talked to [Executive 4] about. [Executive 1] is copying some of the things [another organization] is doing here with his people. Some of this may be not as good with salaried people. I don’t think our approach at professional level is as sophisticated as it needs to be.

Often, the discussion turned towards ways to obtain higher levels of performance on the item (e.g., “What do we have to do to get to a 4 or 5 on this item?”). People followed with ideas of what to do. For example:

CEO: Let’s look at [question] 2.3 under Organization Setting. What does this group need to raise its awareness and score?

Executive: A deliverable. A timeline.

CEO: Let’s get a timeline. The project team needs to get information to us in order to get our team here to 4 or 5. Call a meeting to get us the information.

The final pattern that precipitated discussion is represented in question 1.3 of Figure 1. This was the dispersed pattern, where respondents showed little agreement on the item being evaluated. After an initial remark confirming the lack of agreement (e.g., “Boy, we’re all over the map on that one.”), the ensuing discussion usually involved individuals—particularly those people whose scores were the outliers—explaining the rationale behind their score. Sometimes their explanation was volunteered (e.g., “I gave that a ‘1’ and here’s why…”), while sometimes their explanation was requested (e.g., “John, why did you give that a ‘1’?”).

Responses to the “Why I answered the way I did” subject usually fell into two basic categories:
I’m sticking by my response and here’s why:

- Citing personal observations or experiences about the change initiative that supported the individual’s choice on the survey (“Here are the things I’ve been involved with that lead me to believe that our change initiative is this far along).
- Providing a more summative explanation of where the organization stands regarding the initiative (“This is my perception of where we are.”).

I may have chosen the wrong answer and here’s why:

- Noting only indirect involvement at best with the initiative under evaluation that may have caused an erroneous response (“I really wasn’t involved in this decision so I might not have all the information.”).
- Not having personal evidence to support the answer but guessing about the change’s status anyway (“This is how I thought we MUST be doing it.”).
- Misinterpreting the question (“I thought the question meant something else.”).
- Being torn between multiple responses (“I was on the line between a ‘1’ and a ‘2’ here.”).
- Drifting away from the reference change to some other basis for evaluation (“I was thinking here about how we do change in general rather than this specific initiative.”).

By citing various perspectives and explaining them, group members could express their various perspectives about the change and voice some of their concerns about the current approach. For example:

Facilitator: Question 3.1 shows significant disparity in response.

Executive 1: I’m a 5. I know the intensity of training among my people.

Executive 2: I gave it a 2 because I saw yesterday a matrix of training requirements requiring 70-80 people to still get training.

Executive 3: Looks like we have people at various stages of training.

Executive 4: I’ve sensed ad-hoc training in some parts of the company.

Facilitator: I really haven’t looked at training at the individual level yet to assess skill levels that they need.
Executive 1: The best you can do is provide skills for the new system, and hope people respond.

Executive 3: You know, training and having people ready was a problem at the installation at [the company's Mexican plant]. When it went live, they didn’t have the people skills ready. It was a key shortcoming of the project.

This discussion appeared to generate fresh information for some members of the group. Some meeting participants became informed of certain areas of the change that they had been ignorant about until the meeting (e.g., “I had no idea we were doing that.”). Upon learning that a communications initiative in another part of the operation, one manager proclaimed, “Just finding out about this takes me from a 0 to a 5 on this question just like that.”

Once people’s different views were expressed, there was often additional dialogue about how to close the difference between the various views, and about how to raise everyone’s general level of awareness. For example:

CEO: [This group] needs to have a better understanding of this project or it will never get done. If we score a 4 or 5 on this survey, it will mean that we have a shot at getting it done. Maybe our scores and lack of agreement help explain why we’ve been at this change for 3 or 4 years.

Executive 1: It bothers me that we have this level of management at various levels of score.

CEO: Let’s take goal setting. Not one guy scored this a 5...Question 1.1: three 3’s and three 4’s. As a group, shouldn’t this group be consistently at 4 or 5 to drive this change? What does this group need to do to get to 4 or 5 level? If we’re not at 4, why are we doing this?

Executive 2: But look at what it takes to get to the 5 level. It’s like motherhood and apple pie. I have no disagreement that higher score gets you to Utopia better...But 3’s and 4’s here are not all that bad. The [lower level team in charge of this project] should be the ones doing the homework here.

Executive 3: Yeah, but [the lower level project team] has had problems communicating their issues related to this change.

Executive 1: Is that so? Exactly what have these problems been?

Executive 4: Regardless, this is an issue for [the project team to work out].

CEO: I agree, but this team drives the company. What is it we need to get? Do we need to bring in financial numbers, productivity numbers? We need action steps so that WE can move from 3 to 4.

At every single-organization event that we witnessed, it was became readily apparent that this discussion generated information and facilitated the discussion of issues that had difficulty surfacing in other venues. Particularly when the group was composed of senior managers, the discussion usually became rich with managerial assumptions, challenges, and questions.
The theoretical parallel that comes to mind is the concept of *dialogue*. Dialogue is defined as a sustained collective inquiry into the processes, assumptions, and certainties that compose everyday experience (Isaacs 1993). A consequence of effective organizational dialogue is to reduce or eliminate “defensive routines” (Argyris 1985). A defensive routine is a policy, practice, or action that prevents people involved in a group activity from being embarrassed or threatened, and, at the same time, prevents people from learning how to reduce the causes of embarrassment or threat.

The consequences of defensive routines on strategy development and implementation have been suggested by Janis (1989). Argyris (1989) reported an experiment where executives learned to overcome defensive routines by engaging in dialogue that forced the managers to articulate their underlying assumptions and reservations about particular strategic decisions to be implemented in their organizations. After the experiment, most managers reported that their strategies were being implemented more effectively.

Scholars have suggested various group structures for promoting dialogue. For example, a “community of practice,” composed of members of an occupational group or team who share their common experiences, appears to promote dialogue (Brown and Puguid 1991).

Our early observations suggest that meetings where a group gathers to discuss self-assessment findings, represent another viable organizational structure for promoting dialogue. The self-assessment meetings provide fresh information to ignorant group members, raise important assumptions and concerns about the initiative underway and the underlying organizational assumptions that support them, and promote discussion for how to improve the situation.

The occurrence of dialogue appears more likely when the self-assessment meeting involves a single organization. In the two self-assessment events that we witnessed involving multiple organizations, the occurrence of dialogue was less apparent. A number of factors might reduce the possibility for dialogue in these instances. Often, the entire group (e.g., the senior
leadership team) necessary to support a rich discussion of the findings may not attend these multi-
organization events. On average, only 2 or 3 individuals attended these group workshops—less
than the entire executive staff.

Even if the entire team was present in these multi-group events, it is doubtful that the
group would engage in the rich discussion necessary to achieve dialogue. Most groups would
probably hesitate to air their dirty laundry in front of other organizations. We observed no heated
discussions in the group meetings as we had in many of the single-organization events. Another
factor working against dialogue in the group meetings is time. The multi-group events we
observed usually ran up against time constraints. Groups gathered and discussed their findings at
different paces and were often hurried along due to the amount of time allocated for the
workshop. Sometimes productive dialogue was cut off due to the need to move the entire
workshop group forward.

That said, one salient property of multi-group assessment events is the presence of other
groups from other organizations. Other groups can serve as sounding boards and sources of
advice for other groups who found, through completing the self-assessment instrument or ensuing
discussion, that they had a problem. During the multi-group assessments that we witnessed, once
the members of an organization completed their self-assessment questionnaire, they discussed
their specific findings minimally. In both sessions, however, the facilitator would conduct some
type of exercise to draw out responses and observations from the organizations.

In one session, for example, the facilitator would take a count after each of the eight
survey categories as to how many people scored a 1, a 2, etc. He would graph the scores on a
histogram drawn on a transparency. He would also ask for volunteer responses from the low
scores to share their observations as to why their organization scored so low (e.g., “Why do you
think diagnosis and monitoring is so difficult for your company?”).

At another session, the facilitator asked groups of organizations to identify individual
activities that they should implement in their organization that would improve the implementation
of the change initiative they assessed. Individuals recorded these activities on Post-it notes; then groups of 5-6 people, usually representing multiple organizations, grouped them on a flip chart according to their similarity. This exercise prompted individuals to share their findings and proposed remedies with individuals from other organizations, and to receive ideas, experiences, and critique of their implementation plans from others.

Thus, the discussion that occurs in multi-organization self-assessment gatherings appears different than the discussion in single-organization gatherings. In multi-organization settings, there is more discussion between organizations than within organizations. This discussion still possesses some of the character of dialogue noted above. The content of the discussion involves sharing viewpoints and assumptions about organizational policies and activities. However, this sharing is more between organizations than from within. Rather than organizational learning, the operative theoretical concept here resembles more of mutual learning or collaborative learning (Shiba et al. 1993, Burchill et al. 1996). Rapid learning has been observed in inter-organization groups that gather to develop new managerial technologies or to solve common problems. How mutual learning translates precisely into organization inside organizations has yet to be precisely identified. However, it appears that the multi-organization self-assessment groups provide structure for such learning to occur.

To summarize this section, we suggest that the venue for reporting and discussing the assessment findings is a critical notion in building and explaining a theoretical model of self-assessment. Unlike the written feedback reports that characterize other emerging self-assessment processes (e.g., Baldrige-based self-assessment), we observed a reporting venue based primarily on face-to-face discussion among individuals or between organizations. The discussion often turns into dialogue that promotes organizational learning, and encourages outcomes that can be applied towards better change management. In the next section, we identify and discuss those outcomes.
5.5 Consequences of Self-Assessment

5.5.1 Probing study of self-assessment effects

An overarching proposition suggested by this exploratory work is that self-assessment improves the implementation of change. A thorough test of this proposition suggests a longitudinal study where we could observe groups conduct the self-assessment at multiple points over the life of the change and connect the findings of the self-assessment to outcomes of the change. The luxury of such a study was not ours for this investigation.

However, during the course of this investigation, we were able to obtain some longitudinal data from two organizations (Cases A and B in Table 5.7 below). In both cases, the CEO and executive staff assessed a current change being implemented in their organization against the questionnaire developed by the CQM study group. The group then met to discuss the findings and any possible follow-up. We observed this meeting. The initial survey followed by the self-assessment meeting was labeled as Event 1 (E1 in Table 1). Then, approximately six months later, the same group completed the questionnaire again. This was Event 2 (E2). The completed surveys were forwarded to us. Table 5.7 summarizes some of the background information about these two cases.

Table 5.7: Background on Cases in Longitudinal Study

<table>
<thead>
<tr>
<th>Case</th>
<th>Organization</th>
<th>Reference Change</th>
<th>First Event (E1)</th>
<th>Second Event (E2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Regional vocational school</td>
<td>Deployment of new mission &amp; values in organization</td>
<td>CEO &amp; executive staff (6 total) completed survey and then met to discuss findings.</td>
<td>Same group completed the survey for the same reference change 7 months later.</td>
</tr>
<tr>
<td>B</td>
<td>Auto parts manufacturer</td>
<td>Implementation of shared decision making model in production depts</td>
<td>CEO &amp; executive staff (7 total) completed survey and met to discuss findings.</td>
<td>Six of original group completed the survey for the same reference change 9 months later.</td>
</tr>
</tbody>
</table>

If the initial self-assessment event influenced the change’s implementation, we should expect higher scores for CHANGE ACHIEVEMENT variables in E2 when compared to E1. Since
\textit{CHANGE PROCESS} relates positively to \textit{CHANGE ACHIEVEMENT} (see Chapter 4’s section on criterion-related validity), we should also expect higher scores in the seven categories of \textit{CHANGE PROCESS} variables.

In Tables 5.8 (Case A) and 5.9 (Case B), we compare the mean scores for each of the seven \textit{CHANGE PROCESS} categories and the \textit{CHANGE ACHIEVEMENT} category for E1 and E2. In both cases, the levels of \textit{CHANGE ACHIEVEMENT} improved significantly from E1 to E2, which supports the proposition that self-assessment improves \textit{CHANGE ACHIEVEMENT}. In most cases, the levels of \textit{CHANGE PROCESS} variables also increased. If we combine the findings from Tables 5.8 and 5.9, the \textit{CHANGE PROCESS} means increased significantly 64\% of the time (9 of 14 pooled observations) in E2. However, there were also three occurrences where the \textit{CHANGE PROCESS} category significantly decreased in E2.

We also observed the variance in the assessment groups’ response in E1 and E2. Although the differences in variance were rarely statistically significant, there is an overall tendency for the variance among respondents to decrease in E2. We will develop this notion with more intensity below, but these findings suggest a possible outcome of the self-assessment process as better agreement among the assessors about the current status of the change, which in turn positively influences change achievement.

This is obviously a probing study with severe limitations. We assume here that the higher scores from the second survey administration are related to the self-assessment meeting conducted in conjunction with E1. The organization is proposed to incur positive benefits from meeting to discuss the findings. Indeed, our fieldwork suggests that meeting to discuss the findings is a critical event associated with self-assessment.

However, an improvement in scores between two administrations of a questionnaire may not be related to the self-assessment process itself. A plausible rival hypothesis would be that the improved survey scores simply relate to other organizational activities that occur as part of the change process. When mean levels of \textit{CHANGE PROCESS} categories increase, activities related
the categories are reaching higher levels of sophistication and are seen as improving. For example, training people in change-related skills improves *skill development*, and communicating the rationale behind a change initiative adds to *promotion*. However, self-assessment need not be the source of these improvements. The improvements could be due, for instance, to a well-crafted initial action plan that is being executed according to plan.

**Table 5.8: Comparison of the Two Events for Case A**

<table>
<thead>
<tr>
<th>Comparison of Means</th>
<th>E1</th>
<th>E2</th>
<th>Diff</th>
<th>p</th>
<th>Comparison of Variances</th>
<th>E1</th>
<th>E2</th>
<th>Diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Change Process:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3.77</td>
<td>3.40</td>
<td>-0.37</td>
<td>0.003</td>
<td>***</td>
<td>0.254</td>
<td>0.248</td>
<td>-0.006</td>
<td>0.476</td>
</tr>
<tr>
<td>2</td>
<td>3.27</td>
<td>3.73</td>
<td>0.47</td>
<td>0.009</td>
<td>***</td>
<td>0.202</td>
<td>0.892</td>
<td>0.690</td>
<td>0.000</td>
</tr>
<tr>
<td>3</td>
<td>2.17</td>
<td>4.21</td>
<td>2.04</td>
<td>0.000</td>
<td>***</td>
<td>1.559</td>
<td>0.172</td>
<td>-1.387</td>
<td>0.000</td>
</tr>
<tr>
<td>4</td>
<td>3.61</td>
<td>4.11</td>
<td>0.50</td>
<td>0.013</td>
<td>**</td>
<td>0.252</td>
<td>0.575</td>
<td>0.324</td>
<td>0.049</td>
</tr>
<tr>
<td>5</td>
<td>3.25</td>
<td>3.00</td>
<td>-0.25</td>
<td>0.155</td>
<td></td>
<td>0.978</td>
<td>0.435</td>
<td>-0.543</td>
<td>0.029</td>
</tr>
<tr>
<td>6</td>
<td>3.38</td>
<td>1.79</td>
<td>-1.58</td>
<td>0.000</td>
<td>***</td>
<td>0.592</td>
<td>1.389</td>
<td>0.797</td>
<td>0.023</td>
</tr>
<tr>
<td>7</td>
<td>3.00</td>
<td>3.50</td>
<td>0.50</td>
<td>0.012</td>
<td>**</td>
<td>0.588</td>
<td>0.261</td>
<td>-0.327</td>
<td>0.035</td>
</tr>
<tr>
<td>ave</td>
<td>3.21</td>
<td>3.39</td>
<td>0.19</td>
<td></td>
<td></td>
<td>0.632</td>
<td>0.568</td>
<td>-0.065</td>
<td></td>
</tr>
</tbody>
</table>

**Change Achievement:**

| 8                                    | 4.00| 4.67| 0.67 | 0.037 | **                | 0.400| 0.267| -0.133| 0.334 |

*** significant at 99% level

** significant at 95% level

* significant at 90% level

Notes: Comparison of means = two sided t-test of individual observations in each category assuming unequal variances.

Comparison of variance = F-test of individual observations in each category.

Number of assessors: Jun-99 = 6; Nov-99 = 6.

Ideally, we would have wanted to trail the assessors around the organization once the self-assessment meeting that capped E1 was completed. We could have observed any follow-up that may have resulted from the meeting and linked it with changes in *change process* activities. A follow-up investigation with frequent researcher presence over a 6-8 month period would certainly be fruitful in this regard.
We could also improve this study by adding some “control” organizations that do not conduct the self-assessment meeting. By utilizing a design-of-experiments approach, we could treat some organizations with the self-assessment process while withholding the treatment from others. This would help us isolate the effect of self-assessment from other “normal” change process activities.

Table 5.9: Comparison of the Two Events for Case B

<table>
<thead>
<tr>
<th>Category</th>
<th>E1</th>
<th>E2</th>
<th>Diff</th>
<th>p</th>
<th>E1</th>
<th>E2</th>
<th>Diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change Process:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3.16</td>
<td>2.27</td>
<td>-0.89</td>
<td>0.000***</td>
<td>1.070</td>
<td>0.685</td>
<td>-0.385</td>
<td>0.112</td>
</tr>
<tr>
<td>2</td>
<td>2.49</td>
<td>3.23</td>
<td>0.75</td>
<td>0.039**</td>
<td>2.081</td>
<td>1.978</td>
<td>-0.103</td>
<td>0.448</td>
</tr>
<tr>
<td>3</td>
<td>1.57</td>
<td>3.25</td>
<td>1.68</td>
<td>0.000***</td>
<td>2.857</td>
<td>0.717</td>
<td>-2.140</td>
<td>0.001**</td>
</tr>
<tr>
<td>4</td>
<td>2.79</td>
<td>3.33</td>
<td>0.55</td>
<td>0.148</td>
<td>1.514</td>
<td>1.176</td>
<td>-0.338</td>
<td>0.302</td>
</tr>
<tr>
<td>5</td>
<td>1.07</td>
<td>2.04</td>
<td>0.97</td>
<td>0.001***</td>
<td>1.328</td>
<td>0.824</td>
<td>-0.504</td>
<td>0.124</td>
</tr>
<tr>
<td>6</td>
<td>0.79</td>
<td>1.50</td>
<td>0.71</td>
<td>0.008***</td>
<td>0.989</td>
<td>0.783</td>
<td>-0.207</td>
<td>0.286</td>
</tr>
<tr>
<td>7</td>
<td>1.10</td>
<td>2.29</td>
<td>1.20</td>
<td>0.001***</td>
<td>1.190</td>
<td>1.172</td>
<td>-0.018</td>
<td>0.482</td>
</tr>
<tr>
<td>ave</td>
<td>1.85</td>
<td>2.56</td>
<td>0.71</td>
<td></td>
<td>1.576</td>
<td>1.048</td>
<td>-0.528</td>
<td></td>
</tr>
</tbody>
</table>

| Change Achievement: |
| 8        | 0.43 | 1.50 | 1.07 | 0.005*** | 0.286| 0.300| 0.014| 0.468 |

*** significant at 99% level  
** significant at 95% level  
* significant at 90% level

Notes: Comparison of means = two sided t-test of individual observations in each category assuming unequal variances.  
Comparison of variance = F-test of individual observations in each category.  
Number of assessors in July = 7; in March = 6.

5.5.2 Categories of self-assessment consequences

However, if we ignore the shortcomings of this cursory study, and provisionally accept the proposition that self-assessment improves the implementation of change, how is this relationship explained? We propose the following salient categories of self-assessment consequences: 1) information generation, 2) follow-up action, 3) ability to influence the change process, and 4) consensus.
5.5.2.1 Information generation

First, the self-assessment process as described in previous sections brings information to managers that they may not have otherwise had. The categories of information include change-specific diagnostic information, general information about the organization’s change process, and information that equalizes perspective among individuals.

**Change-specific diagnostic information.** Information is generated about the status of the reference change being evaluated. The information helps managers answer the questions such as “How are we doing?” and “Where are the problems?” that are frequently asked in order to grasp the status and effectiveness of a change’s implementation. In the self-assessment events that we observed, quantitative information about the level of change implementation was obtained from responses to the questionnaire. A unique aspect of these measurements is quantification of *CHANGE PROCESS* variables that may not be available elsewhere in the organization.

Qualitative information about the change is also obtained. Participants sometimes provided a brief verbal synopsis of the status of the change initiative from their viewpoint. Such a progress report was often requested by others in the group if a particular individual was closer to the change initiative (e.g., the project team leader or designated champion) than others in the group.

The survey results also provided diagnostic guidance to the group. For example, low scores on certain questions related to *CHANGE PROCESS* suggested that a particular element of the change process was problematic and required attention. At one event, an executive team observed that the scores on *BEHAVIOR MANAGEMENT* items were relatively low compared to questions from other categories. The facilitator noted this and asked for comments from the group. The subsequent discussion revealed that the executive team had never discussed how reward systems were set throughout the company; every department had a different way of doing it, which appeared to be sending mixed signals throughout the company.
Sometimes even the diagnostic information was qualitative and came from individuals who had some thoughts on where problematic areas were located. Occasionally these ideas contained high emotional content, as if the individual were venting some concern that had been stored under pressure. Consider the response of one individual who had consistently scored the survey questions lower than the rest of the group. After someone in the group again noted his low score on an item, he burst out:

Maybe I’m misunderstanding what we’re trying to do here. But my view is that we are looking for evidence that communications were formalized and in place. I’m a structured guy. I like to see structure. Do we have a written-down plan of what we’re trying to do? No. We don’t have a formal structure for communicating this change to the organization. That’s my problem. My focus was evaluating against the existence of a formal process, moving from A to Z, here’s what we were going to do. We don’t have that here.

Thus, one category of information generated by self-assessment is information specific to the reference change. This information is both quantitative and qualitative, and provides some degree of diagnostic guidance about problematic areas of change process in relationship to the specific change being evaluated.

**General change process information.** Participants sometimes commented that they had difficulty staying focused on the reference change when completing the survey. They confessed to answering the survey questions relative to how the organization implemented change in general. This tendency sometimes carried over into the self-assessment discussion. For example, after observing the low scores on the CONTROL category, one manager concluded out loud, “You know, we just aren’t good finishers.” She then cited a number of change initiatives where, once the change was underway, the executive team never monitored the implementation’s progress.

The tendency to generalize about “how we do change in general” was also evident during the multi-organization assessment meetings. In one multi-group meeting, each organization was asked to complete the first category of the survey related to CHANGE DETERMINATION. Each group then verbally summarized its score for the group, where it was tallied by the facilitator.
The facilitator, noting the overall low level of the scores, inquired, “What are the observations here? Why do you suppose your organizations appear to be so bad at goal setting?” Some of the responses from the organizations included:

“We try to swallow the elephant in one bite rather than breaking up the change into pieces.”

“It’s a leadership thing. You need a high-up person who understands it and has the horsepower. The bigger the change, the more it’s needed. Often, we don’t put a senior-enough person in charge of the change.”

“We’re often so quick to get to market that we ignore the planning.”

We must emphasize the connection between the generation of dialogue as noted in the previous section, and the generation of information about the organization’s overall change process. When the self-assessment discussions advanced towards dialogue, participants began to reveal and reflect on “process problems” and to share thoughts as to why these problems were occurring. The more the self-assessment discussion advanced towards dialogue, the greater the generation of information about the organization’s overall change process.

**Equalizing information.** Due to the various perspectives shared during the self-assessment meeting, individuals usually obtained information about the change that they didn’t previously have. By the end of the meeting, information about the change had been more equally distributed across the group members. In our observations, equalizing information was usually produced when a large amount of dispersion was observed in the responses to a particular question (“We’re all over the map on this one.”), and individuals subsequently explained the rationale behind their response. Often, the explanation revealed activities related to the change’s implementation that other group members were not aware of. For example, a manager might learn of a specific training initiative that was going on in another area of the organization.

Common remarks that signaled the delivery of equalizing information included, “Jeeze, I forgot all about that” or “I had no idea that was going on.” Indeed, one manager remarked near the end of one assessment meeting, “Some of this sharing we’ve done today gets me from a 0 to 5 just like that.”
To summarize, the three categories of information generated from self-assessment are information specific to the change being evaluated, information about the organization’s general processes for implementing change, and information that reduces the information asymmetry among organizational members. These information categories are primarily a consequence of discussions about the assessment findings. The three categories of information generated by self-assessment are summarized in Table 5.10.

Table 5.10: Categories of Information Generated From Self-Assessment

<table>
<thead>
<tr>
<th>Information Category Generated by Self Assessment</th>
<th>Common Sources</th>
<th>Important Questions that the Information Helps Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change-specific diagnostic information</td>
<td>Survey scores. Individual status reports at the self-assessment meeting.</td>
<td>How are we doing? Where are the problems?</td>
</tr>
<tr>
<td>General change process information</td>
<td>Generalizations about the organization’s overall change process triggered by assessing the reference change.</td>
<td>How well does our organization implement change in general?</td>
</tr>
<tr>
<td>Equalizing information</td>
<td>Unique individual knowledge about the change shared with others.</td>
<td>What don’t I know about the change that someone else can tell me?</td>
</tr>
</tbody>
</table>

5.5.2.2 Follow up action

Follow up action is the downstream consequence of information generation. At some meetings we witnessed, items for follow-up were explicitly noted. In other meetings, no items were identified for specific follow-up. In either case, we subsequently interviewed at least one member of the assessment group to discover what actions may have been precipitated by the self-assessment event.

Table 5.11 captures some of the follow-up actions from the self-assessment events we observed. There are two categories of follow-up activity: corrective action and preventive action. Corrective action is follow-up that applies mainly to the reference change under assessment. For example, in the ERP implementation project noted above, the executive team began daily
meetings to track project progress. This action was intended to adjust or correct the change process involved with implementing the ERP initiative.

Preventive action is follow-up that, once implemented, prevents problems from occurring in future implementation efforts. For example, one executive team, after the self-assessment meeting discussion revealed that the team rarely generated action plans and timelines when implementing change, sought training in strategic planning and annual goal deployment from a consultant. Once mastered, such skills can be applied towards better CHANGE PROCESS in future change initiatives.

Of course, it is possible that follow-up fits both the corrective action and preventive action categories. For example, the assessment of a reward system’s effectiveness (see the item listed under the Corrective Action section of Table 5.11) results in changes to the reward system, the revised reward system will likely impact the implementation of future change initiatives as well. Decisions about reward systems, like many organizational design decisions, usually require commitment (Ghemawat 1991). Such decisions are lasting and difficult to quickly unwind.

Table 5.11: Follow-up from Self-Assessment Events

**Corrective Action** *(Applied mainly towards the substantive reference change)*
- Daily meetings to track project progress.
- Presentations from project implementation teams to inform senior management.
- Sending people to training seminars to obtain technical skills associated with the initiative.
- Development of action plans for the change’s implementation and a timeline.
- An assessment of how the reward system could be adjusted to encourage change-related behavior.
- Obtaining survey data from lower levels of the organization about the change.
- Writing an article about the change in the employee newsletter.

**Preventive Action** *(Applied mainly towards improving the process for future change initiatives)*
- Distributing the CQM survey questions to all project teams around the company.
- Assigning future teams each a category to manage for improvement.
- Assessing various change initiatives using the questionnaire to look for similarities and differences.
- Hiring of a consultant to provide training on strategic planning.

The notion of corrective action can be related to the concept of single loop learning (Argyris and Schon 1978). Single loop learning is the most common level of learning, and encompasses the organization’s ability to perceive deviations from perceived performance and
“fix” them. Single loop learning occurs, for example, when managers detect that a significant difference exists between the results achieved from implementing a particular change initiative and the objectives of the initiative, and then take action to correct the deviation.

Corrective action is a consequence of single loop learning. The primary concern is the near term; managers use the information obtained from the self-assessment meeting to correct the course of the current change initiative so that the change is better achieved.

This detect-and-correct sequence also has much in common with the concept of the diagnostic managerial control system (Anthony 1965, Lorange and Scott Morton 1974, Otley and Berry 1980, Merchant 1985, Simons 1995). Indeed, researchers have detected a relationship between factors of organizational learning and managerial control systems (e.g., Kloot 1997). In the context of change management, a diagnostic managerial control system includes a source of information about the status of the change that managers can understand. The system also includes taking corrective action when the information suggests that the change is deviating significantly from the target or objective. The self-assessment process provides information that has a status component (Are we on track?) and a diagnostic component (What do we need to change to get things back on track?). The self-assessment process, therefore, adds to the organization’s propensity for diagnostic managerial control.

While corrective action relates to single loop learning, preventive action resembles Argyris and Schon’s (1978) concept of double loop learning (Argyris and Schon 1978). Double loop learning is more sophisticated, since the organization must review the underlying assumptions that created the problem to be “fixed” in the first place, and adapt a better set of assumptions to support future performance. Extending our earlier example, in addition to correcting the immediate deficit from plan, managers might also step back and question their assumptions and policies that led them to believe that the change initiative was advisable and implementable. Such questioning might cause the managers to revise some key organizational processes, such as leadership processes or processes for understanding market behavior, so that
future strategic initiatives will be more effectively implemented. Diagnosis of assumptions and processes, and subsequent improvements characterize double loop learning.

We have previously noted the connection between the discussions at the self-assessment meetings and the theoretical notion of dialogue. An important consequence of effective organizational dialogue is the reduction of “defensive routines” (Argyris 1985). A defensive routine is a policy, practice, or action that prevents people involved in a group activity from being embarrassed or threatened, and prevents people from learning how to reduce the causes of embarrassment or threat. Defensive routines can adversely impact the organization’s ability to implement change, particularly large-scale strategic changes (Janis 1989).

Dialogue encourages the surfacing of defensive routines so that organization members can understand and reduce their adverse effects. Argyris (1989) reported an experiment where executives learned to overcome defensive routines by engaging in dialogue that forced the managers to articulate their underlying assumptions and reservations about particular strategic decisions to be implemented in their organizations. After the experiment, most managers reported that their strategies were being implemented more effectively.

The self-assessment process can be a source of double loop learning as well as single loop learning. As the discussion in the assessment meeting takes the character of dialogue, more concerns and assumptions are raised about “how we do change in general.” Defensive routines that hinder good decision-making are better understood. Follow up activity that addresses these concerns relates to “changing the change process” for better performance in the future.

The information generated from the self-assessment meetings generates follow-up action. When the information relates to the current change initiative under investigation, the follow-up has a single loop learning character, since it focuses on adjusting the change process to “fix” problems with the current change initiative. When the information reflects insight on the organization’s general process for managing change, the follow-up action has a double-loop
learning character, since the action focuses on “changing the change process” for the better implementation of future change initiatives.

**Proposition 5.8:** The greater the use of self-assessment, the greater the generation of diagnostic information about the status and problems of the change being evaluated that can be used for corrective action.

**Proposition 5.9:** The greater the use of self-assessment, the greater the generation of information about the organization’s general process for implementing change that can be used for preventive action.

### 5.5.2.3 Ability to influence the change process

Self-assessment generates information and follow-up activities that improve the organization’s ability to adjust the organization’s change process so that change is more effectively implemented. We label this conceptual notion *PROCESS INFLUENCE*. *PROCESS INFLUENCE* is improved when information is generated from the self-assessment process that can be used for corrective or preventive action, or both. Higher levels of *PROCESS INFLUENCE* result in more accurate adjustment to *CHANGE PROCESS*. We will elaborate the *PROCESS INFLUENCE* construct in a later section of this chapter.

**Proposition 5.10:** The greater the generation of information for corrective and preventive action from self-assessment, the greater the organization’s *PROCESS INFLUENCE*.

**Proposition 5.11:** The greater the organization’s *PROCESS INFLUENCE*, the more accurately the change process is adjusted for implementing change.

In Chapter 4 we found that accurate adjustment of *CHANGE PROCESS* (implied by higher scores on the items in the CQM change process measurement model) results in better results, i.e., higher levels of *CHANGE ACHIEVEMENT* (see section 4.3 for a review). We restate the proposition here, since it is important for our integrative model of self-assessment:

**Proposition 4.2:** The more accurately change process is adjusted for implementing change, the higher the change achievement.

### 5.5.2.4 Consensus

In the beginning of this section, we presented findings from two case studies that suggested a possible relationship between the self-assessment process and higher levels of change
achievement. Significantly higher mean scores of the change process and results variables were observed 6-9 months after the assessment meeting. Also observed was a tendency for reduced variation among respondents after the 6-9 month period.

This is an interesting preliminary finding, since it encourages hypothesizing about the possible effects of self-assessment on improving agreement among managers and the subsequent achievement of change. Such a relationship has theoretical precedence in the research stream on top management team consensus. Ginsberg (1990) described consensus as the socio-cognitive capacity to synthesize diverse opinions into a shared understanding, which helps the top management team interpret its environment. The proposition that pervades the consensus literature is that agreement among senior managers about strategic issues relates to organizational performance. Top management team consensus has been thought to contribute to a necessary integrated logic and basis for action within the organization (Hambrick 1997). Senior executives that independently pursue their own objectives constitute a fragmented top management team, which is thought to impair performance and adaptability (Hambrick 1995).

Empirical research aimed at verifying the link between consensus and performance has produced mixed results. Bourgeois (1980) found a significant correlation between the degree to which management teams agreed upon the methods their firms were using to compete and the firms’ performance, but no correlation between agreement on goals and performance. Iaquinto and Fredrickson (1997) found that top management team agreement about the consequences of its strategic decision process was positively related to performance. They also found that top management teams from smaller organizations tended to exhibit more agreement that did teams from larger firms.

Conversely, West and Schwenk (1996) found no significant relationship between goals consensus, means consensus, and performance variables after controlling for team demographics variables and industry stability variables. Some scholars have suggested possible intervening variables, such as whether the organization’s strategy was under revision (Wooldridge and Floyd
(1989), industry variables (Priem 1990), and conflict management skills of the top management team (Knight et al. 1999), that might moderate the consensus-performance relationship.

Smith and Kofron (1996) argued that an important flaw in top management team research design has been failure to consider the intervener of implementation on achieving strategic goals. Most research, they observed, has examined management’s agreement on goals and the relationship between this agreement and performance variables; little consideration has been given to implementation variables as moderators. The researchers added that there has been little research linking top management teams with strategy implementation processes. This is despite conventional wisdom that top managers spend a significant portion of their time engaged in routine activities such as communication, evaluating, and controlling (Barnard 1938, Newman 1940, Mintzberg 1973, Kotter 1982)—activities that are viewed strongly associated with implementing strategic change (Hrebeniak and Joyce 1984).

Our preliminary findings add to the conversation of consensus research since the findings consider top management consensus on change implementation—a missing link in previous consensus research (Smith and Kofron 1996). The reductions in variation among respondents reflected in Tables 5.8 and 5.9 suggest a possible relationship between self-assessment, consensus among managers on a change’s level of implementation, and performance.

To further explore the possible relationship between the degree of management agreement about a change’s implementation and performance, we returned to our survey database that we utilized in Chapter 4 (see section 4.1.2). We found 16 cases where 3 or more individuals from the same organization completed the survey for the same reference change. For each question in the survey, we calculated the standard deviation across respondents. For example, if three people responded to question 1.4, and their individual responses were 2, 3, and 3, then the standard deviation for that item was 0.577. Next we found the mean of the standard deviations determined from each of the 29 questionnaire items representing CHANGE PROCESS. This
average standard deviation was our representation of “consensus” among organizational members about the current status of the change initiative.

We used item 8.1 of the CHANGE ACHIEVEMENT category as a representation of “performance.” Item 8.1 asks the respondent for an assessment of how well the change has achieved business results. This item was used because it was present in all versions of the CQM survey and performed well in the measurement analysis in Chapter 4.

Therefore, our data set consisted of 16 data points where the $X$ variable was the standard deviation of the management team about the current level of CHANGE PROCESS, and the $Y$ variable was the average response to the level of change achievement. The relationship between consensus and performance appears in Figure 5.3. A significant relationship is observable. Performance (CHANGE ACHIEVEMENT) decreases as variation among respondents on the level of change process increases. The regression coefficient (-3.92) is significant (p=.0056); the adjusted $R^2$ of this relationship is 0.39.

These results hint at a relationship between management’s consensus on the current level of change implementation and the level achievement of change. These findings support the theoretical intersection of top management teams, consensus, and change implementation proposed by Smith and Kofron (1996). Our findings suggest that a relationship between consensus and performance may exist when the degree of consensus on change implementation is evaluated. Assessing consensus using measures that capture the degree of agreement on implementation may be desirable as an addition to, or a replacement of, the conventional consensus measures that capture the degree of goal agreement.

Why should this be so? Senior managers affect organizational activities and performance in large part through the decisions or strategic choices they make (Cyert and March 1963, Hambrick and Mason 1984). Due to their decision-making authority, executives also control how resources are deployed in the organization (Tannenbaum 1967). Managers that do not agree on the levels on the change process variables that influence implementation may be deploying
resources in ways that inhibit change achievement. The managers may be uninformed, or they may not be aware of the contribution they need to make. Measuring agreement on implementation variables captures a dynamic component of consensus that has not been widely examined.

**Figure 5.3: Performance Versus Consensus**

As noted above, self-assessment generates equalizing information among the members of assessment group. We suggest that this information improves consensus among managers on the status and direction of a change initiative. To understand how this might occur, consider the following example. Near the end of one self-assessment meeting, some executive team members expressed concern about their low, uneven response to many of the questions posed by the survey. This was a concern because the ERP installation being assessed was scheduled to “go live” across the organization within a month; the consequences of a poor start-up of the system would be costly. Here is part of the dialogue:

Executive 1: I have some anxieties about this. I can’t answer all the questions

Executive 2: Boy, I agree. If we can’t answer all the questions related to this project, and it’s due to go live in a couple weeks, then we’re asking for trouble.
CEO: OK. Let’s assemble each individual’s concerns. There’s a flip chart. Let’s catalogue them. [Executive 3], you’re first…. 

The managers proceeded to list their concerns, which were then discussed among the group. The group then generated a list of action items that they agreed needed to be done in order for the implementation to be successful. In addition, the executive staff began daily meetings to monitor the progress of the project.

Equalizing information generated from self-assessment improves consensus. When consensus is improved, managers are better able to deploy resources necessary to make the change happen. Consensus on where the change is headed enables functional managers to more effectively share and coordinate resources with others. Coordinated effort is difficult unless functional managers understand the importance and sequence of the various implementation activities, and release the proper resources at the proper time. Consensus on the status of a change’s implementation improves managerial efforts to deploy resources toward effective implementation. Consensus, therefore, improves the organization’s PROCESS INFLUENCE.

**Proposition 5.12:** The greater the use of self-assessment, the greater the generation of equalizing information about the change that encourages consensus among group members.

**Proposition 5.13:** The greater the consensus among managers about the level and direction of the change, the better the organization’s PROCESS INFLUENCE.

### 5.6 An Integrated Self-Assessment Model

In Figure 5.4, we integrate the theoretical variables and relationships into a model of self-assessment in the context of managing change.

In the context of managing change, self-assessment occurs when organizational members gather to evaluate the implementation of a change initiative in their organization. Self-assessment is encouraged when the organizational members have access to a model of change that is perceived as valuable. Self-assessment is also encouraged when senior managers are actively involved in the process, and when the organization exhibits characteristics of a learning...
organization. If the change is large in scale and ill-defined it will be difficult to implement. Self-assessment may be desirable in this case, since it provides information for evaluation and control of the change’s implementation that may not be available elsewhere.

The assessment process, through reporting and discussion venues, generates information about the implementation status of the change being evaluated and about necessary corrective action. If dialogue occurs, the self-assessment process surfaces issues and exposes defensive routines that make the existing change process dysfunctional and points towards preventative action necessary to improve future initiatives. Finally, the sharing of views and understanding of future adjustments necessary promotes better consensus among those at the self-assessment gathering on what needs to be done.

Figure 5.4: Variables of the Self-Assessment Model and Their Proposed Relationships

- **Upper mgmt involvement** (+) P5.3
- **Learning and experimenting tendency** (+) P5.2 (+) P5.4 (-) P5.9 (+) P5.1 (+) P5.12
- **Information about long-term barriers to change that encourages preventive action**
- **Information that equalizes people’s understanding of the change and encourages consensus on direction** (+) P5.8 (+) P5.10 (+) P5.13
- **Information on implementation status that encourages corrective action**
- **Accuracy adjustment to CHANGE PROCESS during implementation** (+) P5.11 (+) P4.2
- **Ability to revise the change process (PROCESS INFLUENCE)**
- **Perceived model value** (+) P5.1
- **Use of self-assessment process** (+) P5.7
- **Scope & ill-definition of change** (-) P5.5 (-) P5.6 (+) P5.10 (+) P5.12
- **Accurate adjustment to CHANGE PROCESS during implementation** (+) P5.11 (+) P4.2
- **CHANGE ACHIEVEMENT**
Each of these direct outcomes affects the organization’s ability to effectively revise the elements of the change process. As the organization’s ability to revise the change process improves, the change process is more accurately adjusted to encourage better change implementation. As the levels of change process variables improve, the level of change achievement improves also.

We might note here that the relationships portrayed here are unidirectional. That is, we have proposed no complex feedback loops that might better capture the dynamic of the self-assessment process under real conditions. For example, we might propose that positive results that accrue as a result of self-assessment might feed back to the organization’s propensity to use the self-assessment process in a reinforcing fashion. Such causal loops are certainly plausible (if not probable) additions to this model in future, more sophisticated investigations. For an example of how causal loop diagrams can improve the explanatory value of a model, see (Burchill and Kim 1993, Burchill and Fine 1997).

5.7 Some Comments on Managerial Control and Change Management

5.7.1 Theoretical and empirical motivation

During this investigation, we evoked a number of theoretical concepts outside the mainstream organizational change literature to help build and explain an integrative model of change process and its use in self-assessment. Do any of these outside streams hold particular promise for building theory in change management? We are enthusiastic about research on managerial control systems, and the potential contribution of mixing concepts from this stream into change management research.

Simply stated, managerial control systems help organizations “keep things on track” (Merchant 1985). The diagnostic managerial control system is perhaps the most widely deployed and certainly the most studied type of managerial control system. Typical examples of diagnostic
control systems in organizations include profit plans and budgets, management by objectives systems, standard cost accounting systems, and project management systems (Simons 1995: 61).

A conceptual diagram of a diagnostic control system appears in Figure 5.5. In a diagnostic managerial control system, the output (or result) of an organizational process is measured and compared to a predetermined target or goal. If the results deviate too far from the goal, managers take corrective action by changing variables associated with either the organizational process, inputs to the process, or both. Corrective action continues until the results are within an acceptable range of the goal or objective. Therefore, to control a process, it must be possible to (1) develop preset standards or goals for the process’s output, (2) measure the output, (3) correct deviations between the output measure and the standard (Lawler and Rhode 1976, Otley and Berry 1980, Merchant 1985).

Figure 5.5: Basic Representation of a Diagnostic Control System

In the context of strategic management, managerial control theorists have suggested that a diagnostic control system provides essential structure for implementing decided-upon programs (Anthony 1965, Lorange and Scott Morton 1974, Merchant 1985). Control targets and variables, extracted from program plans, are used to monitor the organization’s compliance with achieving the program.

The conceptual importance of managerial control systems has bled into other disciplines as well. For example, strategic management scholars have prescribed monitoring and control structure as part of effective strategic process (e.g., Andrews 1971, Hofer and Schendel 1978, Hrebeniak and Joyce 1984). Organizational theorists have also incorporated the notion of
managerial control systems into frameworks of organizational change. Managerial control systems are often part the organizational “structure” or “systems” constructs specified in many prominent models of organizational change and development (e.g., Nadler and Tushman 1980, Tichy 1983, Burke and Litwin 1992). The emphasis on managerial control systems is somewhat diluted, however, since control systems are often buried beneath an abstract, higher order structure or systems construct.

Despite the acknowledged theoretical importance, evidence suggests that managerial control systems are both underutilized empirically and under researched by scholars in the context of change management (Goold and Quinn 1990). Commentators have cited the failure to monitor organizational change initiatives as a major cause of failed change initiatives (e.g., Beer, Eisenstat, and Spector 1990, Kotter and Schlesinger 1992, Kotter 1995). Surveys of empirical change management practices suggest that at least 50% of all organizational change initiatives go unmeasured or unmonitored (e.g., Troy 1994, Morgan and Schiemann 1999, Buchanan, Claydon, and Doyle 1999). In a well-written empirical article, Charan and Colvin (1999) provocatively argued the connection between the degree to which a CEO monitors and controls the organization’s major strategic initiatives and the degree of the CEO’s success.

Little empirical research has explored managerial control systems in the context of change management. Of the extant research, most has come from scholars in managerial control. For example, Lorange and Murphy (1984) interviewed managers at 25 large firms to identify barriers that inhibited the implementation of strategic control systems. The inability to set appropriate performance measures, limitation in manager’s ability to process and respond to control signals (because of vested interests or fears of being proven wrong in strategy formulation), and lack of perceived effectiveness of strategic control systems among organizational coalitions were identified as barriers to control system implementation. Goold and Quinn (1990) added that managerial control systems are often poorly designed, since they are
inflexible to changes in implementation of strategy, frequently try to replace rather than assist management judgment, and commonly destroy mutual confidence among levels of management.

Simons (1994) studied how a group of top managers utilized control systems to promote strategic change and renewal. In addition to the traditional measuring and monitoring functions, control systems were also used to overcome organizational inertia, to communicate new strategic agendas, to establish implementation timetables and targets, and to ensure ongoing attention to new strategic initiatives.

5.7.2 Relevant findings from our study

5.7.2.1 The CONTROL construct in a model of change process

Our findings contribute to a conversation of managerial control systems in the context of change management in a number of ways. Unlike other models of organizational change, the model developed in this investigation considers managerial control as one of seven primary constructs of change process. The control construct’s prominent position in the model permits more direct study of the managerial control concept in terms of its interaction with other change process variables, and in terms of its affect on change achievement.

Emphasizing a control construct in a model of change process appears valid. In Chapter 3 we found considerable support from the theoretical literature and from practicing managers for including a managerial control construct in the model. The four questionnaire items developed to reflect CONTROL (see Table 3.6) reflect the following dimensions of managerial control’s theoretical domain:

1. Obtaining information about the status or progress of an initiative.
2. Taking action when the information suggests that it is necessary.
3. Demonstrating effective adjustment of the process based on the corrective action.
4. Reviewing the process itself for improvement opportunities.

In our evaluation of the construct validity of CONTROL in Chapter 4, we found high internal consistency among the first three items listed above. These three items (obtaining information, taking corrective action, connection of action to substantive results) largely reflect
characteristics of diagnostic control systems discussed earlier. Since diagnostic control systems are primarily focused on “fixing problems” with little or no reflective component, they resemble a single loop (Argyris and Schon 1978) learning mechanism. The fourth item listed above, was not internally consistent with the other CONTROL items in our Chapter 4 measurement model analysis. This item, reviewing the process itself for improvement, requires reflective activity more characteristic of double loop (Argyris and Schon 1978) learning. Ineed, this conceptual difference helps us explain the lack of unidimensionality in the four-item CONTROL construct from a theoretical standpoint.

Although the notion of managerial control expressed in our model is somewhat intuitive and has theoretical roots (Forrester 1958, Anthony 1964, Churchman 1968), measurement models that enact the notion are rare in the literature. In the mainstream change management literature, we could find no examples of published empirical research that included a measurable representation of the managerial control construct. The expression of managerial control in our model will perhaps spark more conversation in this regard.

Managerial control appears significantly related to the achievement of change. Among the seven constructs of CHANGE PROCESS investigated in Chapter 4, CONTROL was among the best predictors of CHANGE ACHIEVEMENT. CONTROL exhibited the highest correlation coefficient with CHANGE ACHIEVEMENT (Table 4.22). The construct also contributed significantly in multivariate models of CHANGE PROCESS and CHANGE ACHIEVEMENT (Tables 4.23, 4.24, 4.32, 4.33).

A scatter plot of CONTROL and CHANGE ACHIEVEMENT appears in Figure 5.6. The data in Figure 5.6 come from the summated scale data set used to conduct the regression analysis in Chapter 4 (see section 4.2.1). The relationship below reflects the CONTROL data prior to the transformation we employed to improve linearity. Of the seven constructs of CHANGE PROCESS, CONTROL was the only construct whose data set exhibited significant curvilinear behavior when plotted against the data from other constructs.
Although the curvilinear behavior may be due to a sampling anomaly, it is interesting to hypothesize about increasing returns to scale when the levels of the managerial control variable increase. Stated another way, the marginal benefits of increasing managerial control activities may be insignificant until a certain threshold is reached. If such a proposition were true, it might help guide theory and practical work towards designing control systems of sufficient enough influence or sophistication to make a difference in change achievement. Further work is needed to explore this relationship.

5.7.2.2 Self-assessment’s relationship to managerial control structure

Earlier in this chapter we proposed an integrated model of self-assessment in the context of change management (see section 5.6). Based on the outcomes of the process, it is evident that self-assessment contributes to the organization’s managerial control structure. To understand how this can be so, let’s revisit the integrative model portrayed in Figure 5.5.

Figure 5.7 repeats our earlier diagram, with the exception that we have drawn a dotted line around the portions of the model that capture concepts commonly associated with managerial
control systems. Information about the status of the change improves the ability to revise the change process. Improved ability to revise the change process relates to more accurate adjustment of organizational process during the change’s implementation. A more accurately adjusted change process relates to better change achievement.

**Figure 5.7: Self-Assessment Framework With Managerial Control Portions Emphasized**

The circled variables in Figure 5.7 reflect components of a diagnostic managerial control system. Such systems are aimed at “fixing” problems at the substantive level, with little further questioning about the deep organizational policies and assumptions that generated the problem in the first place. This focus on the substantive problem with little further reflection reflects single
loop learning (Argyris and Schon 1978). This helps explain why some of the other consequences of self-assessment as portrayed in Figure 5.7 were not circled. These consequences, related to identifying barriers to long term change and achieving consensus, tend to a deeper reflective process.

By addressing these longer-term barriers to change, double loop learning (Argyris and Schon 1978) occurs, enabling longer-term process change that prevents future problems from occurring. Another type of managerial control system, the interactive control system (Simons 1995), provides a useful theoretical basis for viewing double loop learning in the context of managerial control.

An interactive control system assists managers in identifying situations that require the organization to reset its strategic direction. Interactive control systems have four defining characteristics (Simon 1995: 97). (1) Information generated by the system satisfies an important and recurring agenda of the highest levels of management. (2) The interactive control system demands frequent and regular attention from operating managers at all levels of the organization. (3) Data generated by the system are interpreted and discussed in face-to-face meetings of superiors, subordinates, and peers. (4) The system is a catalyst for the continual challenge and debate of underlying data, assumptions, and action plans. Such a system features a double loop learning mechanism since it promotes organizational members at various levels to interact and to frequently question their assumptions that drive daily activities.

Systems designed for other purposes often double as interactive control systems. In a study of 30 health care products businesses, Simons (1991) found that senior managers typically used a number of systems interactively, including project management systems, profit planning systems, brand revenue budgets, intelligence systems, and human resource systems.

While many of these systems can be effective, Simons (1995) argued that managers should use few systems interactively. Interactive control systems impose significant costs, since more managerial attention must be allocated to interactive systems in comparison to diagnostic
systems. Managerial attention is a scarce organizational resource and typically constrains the organization from exploiting all opportunities available (Simon 1976). Interactive control systems also deliver higher quantities of complex information that challenges managerial capacity to process it effectively. Finally, the most effective system to be used interactively typically depends on the organization’s strategy. For example, a capital budgeting system may a poor choice for an interactive control system if the firm has low capital requirements, or if discussion about capital budgeting does not promise to spark discussion about the firm’s key strategic assumptions and policies.

Many characteristics of the self-assessment process noted earlier in this chapter suggest that self-assessment, particularly the meeting to discuss the assessment findings, can serve as an interactive control system. When senior executives are involved, self-assessment meetings generate considerable discussion. The CEO’s participation allows subordinates to observe higher-level personnel in action, and stimulates exchange between levels thought to enhance organizational learning (Lave and Wenger 1990). The visual display of results also invites and spurs discussion among members. Frequently the discussion advances towards dialogue (Isaacs 1993), where individuals surface tightly held reservations and assumptions about the change initiative and how the organization managed change in general. Dialogue generates information for long-term improvement to key organizational change processes.

We suggest that self-assessment process can serve an important function in both diagnostic and interactive managerial control. The self-assessment process generates diagnostic information on the substantive change; this information can be applied towards diagnostic control. The self-assessment process can also generate information about organizational assumptions and defensive routines (Argyris 1985) that impede long term change. Such information assists interactive control.
5.7.3 The construct of \textit{PROCESS INFLUENCE}

Near the end of section 5.5 we introduced the construct of \textit{PROCESS INFLUENCE}. The label for this construct was inspired by the work of Simons (1995). An essential condition for effective diagnostic control is the ability to correct deviations. In systems theory, a system is controllable if the system can be forced from one state to another by adjusting system variables (Amey 1979). However, the ability to \textit{influence} a system requires only that adjustment causes the system to move from one state to another, incompletely defined state (Simons 1995:72). In the organizational context, Simons observed that managers usually influence organizational processes and performance variables rather than strictly controlling them. Managerial control systems are therefore effective when managers can influence processes significantly.

\textit{PROCESS INFLUENCE} is the skill or capability to influence the organization’s change process. The higher the \textit{PROCESS INFLUENCE}, the more accurately the organizational variables associated with the change process can be adjusted or revised to facilitate effective implementation. Effective implementation results in better \textit{CHANGE ACHIEVEMENT}. The sequence can be viewed as:

\begin{itemize}
  \item Information acquisition \rightarrow Enhanced \textit{PROCESS INFLUENCE} \rightarrow Accurate \textit{CHANGE PROCESS}
  \item adjustment \rightarrow \textit{CHANGE ACHIEVEMENT}
\end{itemize}

This arrow diagram suggests the important role of \textit{PROCESS INFLUENCE} in change management. \textit{PROCESS INFLUENCE} bridges the relationship between information acquisition and adjusting the change process for better change achievement. Inserting the \textit{PROCESS INFLUENCE} variable into the sequence is conceptually enlightening to us, since it helps us explain a phenomenon that intrigued us during our fieldwork.

That phenomenon was the disconnect between the gathering of data and successful change achievement. Of the 12 organizations that we visited during this study, at least two-thirds of them had a system for gathered and reporting important data about organizational performance. Many of these systems were textbook examples of Kaplan and Norton’s (1992) balanced
scorecard approach. These organizations routinely aggregated information on key customer, financial, operational, and human resource dimensions and posted the tables and graphs in well-traveled areas so that people at all levels, including senior level managers, could monitor organizational performance. In at least 4 organizations, our hosts showed us links between unsatisfactory levels or trends in a performance indicator, and organized activity aimed at improving performance.

It was much more difficult to see where these organizational activities (project teams, task forces, quality improvement teams, etc.) had actually improved performance. Our hosts proposed a number reasons for this disconnect. Some examples:

“The task force hasn’t determined the cause of the problem yet.”
“We’ve had fires to put out that have distracted our improvement efforts.”
“It will take time for the solutions to show up in the data.”
“The champion of the team has left and we need to find another.”

We talked to a CQO following a presentation of her firm’s successful implementation of a Hoshin planning process. Hoshin planning is a structured approach to setting and deploying a focused set of organizational goals, usually on an annual basis. The firm was now in its second annual planning cycle using the Hoshin process. Like many strategic planning processes, Hoshin encourages the identification and monitoring of key indicators of performance. At this firm, the executive team met monthly to discuss status of the Hoshin-related goals. What caught our attention was that the overall Hoshin objective, a 12% sales increase for the firm during the fiscal year, was not achieved. We wondered how this was handled during the monthly review meetings. Here is the CQO’s response.

That was a frustrating thing for us. We developed a simple green-yellow-red color-coded format for our key measure reports so that our people could easily pick out the measures that indicated problems. After a couple of months, a number of our indicators were blinking red at us. In some cases, the person responsible volunteered to try something new in his or her area. Other times, we didn’t know what to do. Some of the meetings during the year were agonizing because we had these red lights blinking at us telling us that we had a problem—but we didn’t know what to do to change it.

We witnessed something similar during the self-assessment meetings. At many of the meetings, the survey results revealed a number of low scoring areas of CHANGE PROCESS that
suggested some type of follow-up action. For example, at one event all respondents had scored the questions related to BEHAVIOR MANAGEMENT at 1 or less. However, after some discussion about the low level of scores, nothing was resolved about what to do about it. Even though the group had information that suggested action should be taken, they didn’t follow-up. We witnessed such a situation in a number of cases.

Our point here is that managerial control is not about measurement and information. It is often said that “what gets measured gets done” or “what gets measured gets managed.” Indeed, we suspect that the initial images in many people’s minds when the phrase “process control” is uttered relate to data, measurement, and reports. We suggest that in many organizations, getting the information may be the easy part. What matters is what is done with the information. PROCESS INFLUENCE moderates the relationship between information and, change process, and performance. Information improves an organization’s capability to influence the process. This capability affects the actual adjustment of organizational processes that make change

Although viewing PROCESS INFLUENCE as an organizational capability is useful, the construct is reflected mainly by the behavior of the organization’s senior managers. Executives represent the dominant coalition in most organizations (Cyert and March 1963) and their decisions exert considerable influence on organizational activities and outcomes (Kotter and Heskett 1992). However, senior managers rarely change operational variables themselves. Rather, through indirect mechanisms (direct order, threat, verbal persuasion, inspirational example, monetary reward, etc.), managers influence others in the organization to adjust behavioral variables that will make change happen better.

What might be included in a construct of PROCESS INFLUENCE? A number of dimensions seem plausible.

Value chain understanding. Porter (1985) argued that a trait of successful firms was senior management’s exceptional understanding of the firm’s critical operating and support processes. Porter termed these operational and support processes the value chain. Value chain
understanding allowed them to make good strategic decisions. Indeed. When implementing change, it helps to have a sense of what will happen when a process variable is changed. Changing the wrong variable, or adjusting it the wrong way, can impede effective change.

As we write this, investors are punishing the stock of Procter & Gamble Company after the company warned of lower than expected sales and earnings growth for the third consecutive quarter. Concurrent with this announcement was the sudden retirement of the CEO, who only 18 months earlier had been installed as a change agent to restructure the organization for more innovation and responsiveness. The new CEO attributed some of P&G’s performance problems to decisions that shifted resources to the wrong areas. For example, he cited disproportionately high capital allocations to fund new product development and marketing at the expense of maintaining established product lines as contributing to depressed company performance (Nelson and Deogun 2000). In an area related to supply chain management, the distribution of some product lines had been reallocated across a larger number of retailers, alienating a core group of long-time retailers that had previously been granted exclusive distribution privileges. Many of these previously loyal customers defected (Nelson 2000). Insiders also claimed that the former CEO practiced a punitive approach to behavior management that caused a number of talented managers to leave the company (Lombaerde and Frazier 2000).

It seems unlikely that this CEO would make these changes if he knew that the changes would result in unreasonably poor performance. Perhaps what he lacked was an understanding of the firm’s value chain, and how reconfiguring it would affect results. Better value chain understanding would have facilitated more effective process adjustment and more favorable consequences for many of the company’s stakeholders.

This is not an isolated example, only a convenient one. The “change stories” in the popular business provide myriad examples of organizations that appear to “change the wrong thing.”
Not knowing what to change might also paralyze the organization into doing nothing. In our Hoshin planning example noted earlier, managers had data that performance was unacceptable, but they did not know what to change. The consequence was inactivity.

**Initiating revision.** The ability to initiate revision is another dimension of *PROCESS INFLUENCE*. A sub-dimension relates to recognizing that revision is needed, based on the information. There are cognitive limits to a manager’s rationality and information processing ability (March and Simon 1958). The information processing abilities of managers can vary significantly (Eisenhardt 1989). Indeed, “information overload” is a commonly cited managerial problem. As one CEO in our study eloquently stated during one of the self-assessment events, “I’ve had 20 years in the business and I’m exploding with feedback…More feedback is not what I need. Maybe the rest of you do, but not me.”

Managers that cannot perceive a significant deviation between performance and target will not initiate corrective action necessary for process revision. The capacity to work with data and process information appears an important dimension of *PROCESS INFLUENCE*.

Initiating revision also requires managers to get action going. The following narrative by Colvin and Charan (1999) captures one way that this concept can be operationalized in the context of managerial control:

With their initiatives firm, effective CEOs implement them through a process that seems simple, even obvious, but has profound effects. Watch the likes of [General Electric CEO Jack] Welch or EDS’s Richard Brown or [former Allied Signal CEO] Lawrence Bossidy or any other proven implementer in a meeting. Near the end he’ll grab a pen and start writing: He’s noting exactly what is supposed to be done by whom, by when. He’ll go over this with everyone before the meeting closes, and he’ll probably send each one a reminder afterward (p.76).

Managers might “get things going” through other means. Practices commonly associated with the leadership construct, such as developing and communicating a compelling organizational objective, are thought to influence the organizations ability to act (Zaleznik 1977, Burns 1978, Weiner and Mahoney 1981, Bennis and Nanus 1985, Torbert 1987). Managers can entice others to act by selling or promoting the need for change (Hambrick and Cannella 1991). Setting a good
example, or “walking the talk,” by effectively modeling desirable new behaviors might encourage others to take action (Wood and Bandura 1989, Steyrer 1998).

**Ensuring execution.** A third dimension of *PROCESS INFLUENCE*, and perhaps the conceptually richest one, relates to ensuring that the initiated revisions to the change process are completely executed and effective. High levels of *PROCESS INFLUENCE* are attained when managers ensure that the organization follows through on adjustments to the process, and that the adjustment are effective. On the low end of the scale, execution is not monitored at all. Larry Ellison, the flamboyant founder and CEO of software maker Oracle Corp., was chastised for twice initiating company wide strategic changes initiatives and then taking an extended leave of absence (Schlender 1999). In both cases, the initiatives floundered in his absence.

As we move up the scale, the construct begins capturing sub-dimensions related to checking on the status of execution, obtaining commitment, making people accountable, and taking additional corrective action if a deviation from target persists. Review meetings, email exchanges, follow-up phone calls, visits with outside stakeholders, routine reports, and hallway talk are all possible activities that could contain a monitoring component. Studying the various organizational structures that facilitate the monitoring of execution—how these structures work and the situations in which certain structure is most effective—appears ripe for further study.

We sense that somewhere in the *PROCESS INFLUENCE* construct there is room for a dimension related to the personal characteristics of managers that contribute to, or detract from, *PROCESS INFLUENCE*. For example, a CEO who displays withdrawn, timid tendencies may not have the wherewithal to stimulate action—nor the stomach to challenge subordinates who are not effectively executing the corrective action. In more than one self-assessment event that we witnessed, we sensed that a more demanding or aggressive CEO would have urged more follow-up on the assessment findings.

The dimensions of *PROCESS INFLUENCE* appear in Figure 5.8. They are conceptually dense, and suggest issues related to implementation that have received little integrative scholarly
attention. This construct entered into our minds at the periphery of our investigation. It was the product of constantly questioning, “Where do the breakdowns occur in implementing change?” Our formative data lead to the proposition that, in many cases, a breakdown commonly occurs after information indicates that a mid-stream correction to the change process is necessary. When PROCESS INFLUENCE is low, the organization lacks the ability to accurately revise the change process for better results—even in the face of information shouting that the current settings of the change process variables are ineffective.

Without influence, an organization must be good at initial implementation planning—or lucky—since initial change process settings will be difficult to accurately revise. Conversely, an organization that possesses high levels of PROCESS INFLUENCE can afford to misadjust the change process initially, since accurate process revision is likely once information about the progress of implementation is available. Investigating this construct in the context of change management should produce theoretical reward.

Figure 5.8: Dimensions of PROCESS INFLUENCE

5.8 Summary

In this chapter, our objective was to initiate a theoretical conversation about self-assessment in the context of change management. We generated a number of theoretical propositions and a provisional model of self-assessment, its antecedents, and its consequences. In
addition we elaborated the relationship between managerial control systems and change management, and introduced a promising related construct.

5.8.1 Implications for Managers

The key take-away for managers from this study is the importance of the venue for reporting and discussing self-assessment findings. The venue investigated in our investigation was the self-assessment meeting, where managers often collected the data, analyzed the results, and determined corrective action at the same gathering. When managers gather to discuss the findings of self-assessment, information is generated about the substantive change under assessment and about general policies and barriers that generally impede organizational change. This information can be converted into action to better implement existing and future changes. It is difficult to how this information could be generated without group discussion. This is important, since it implies that self-assessment projects that don’t include a managerial discussion of the results may be a waste of time. Without the generation of information and the collective learning that occurs in these gatherings, the likelihood that self-assessment will contribute to successful change management is proposed to be small.

Organizational assessments require a model (Hausser 1980). The model helps define what gets assessed. To stimulate self-assessment in an organization, a valuable model must be available to the organization. Value, however, is in the eye of the beholder. Managers might perceive value based on a number of dimensions, including the conceptual domain represented by the model, the concreteness of the wording of the model, the model’s ability to reinforce the organization’s common language, the diagnostic guidance that the model provides, how the model is expressed (questionnaire, narrative, other), the model’s track record, and the model’s affiliation. Without a valuable model, it is doubtful that self-assessment will be attempted much less institutionalized.

The self-assessment process that we observed and described appears appropriate for changes that are important to the organization. When the scope of the change is narrow and
resembles a project, the organization most likely has other, more effective, structures for managing the change. Changes that are large in scope are usually strategic and usually carry high-stakes (Hickson et al. 1986). Strategic changes are often difficult to define and measure as well (Nadler and Tushman 1989). Self-assessment provides structure for senior managers to obtain information about the strategic change that may not be available through other channels. By reserving self-assessment for important organizational changes, managerial attention, a scarce organizational resource (Simons 1976), is conserved.

Most changes do not go as planned and require midstream revision (Quinn 1980). However, systems for monitoring and control of change implementation appears lacking in at least 50% of all organizational change initiatives (Troy 1994, Carr, et al. 1996, Buchanan et al. 1999). Managers are well advised to consider the value of strengthening processes for monitoring and controlling the implementation of change.

Self-assessment can add to managerial control structure and ultimately to better change achievement. The immediate outcome of self-assessment is information about the status of a change initiative and where to go in the process to correct or prevent problems. This information may be difficult to obtain through other channels. However, in order to influence results, this information must be used. Our study suggests that converting information from self-assessment (or from any information system for that matter) into corrective or preventive action is not a given. It is more like a talent or competency. Recognizing the need to act based on the information, initiating actions to revise the change process, and checking to ensure effective execution of the revisions are key dimensions of this talent. Further research should add more light on the practical dimensions of an organization’s ability to influence its change process (i.e., the construct of PROCESS INFLUENCE).

5.8.2 Implications for researchers

Our main theoretical objective was to initiate a research conversation about self-assessment in the context of change management. Although we observe the self-assessment
phenomenon empirically, researchers have not developed it well theoretically. In this chapter, we have proposed a number of theoretical categories or variables related to self-assessment and established provisional relationships between them. These propositions, of course, require more testing, and will hopefully stimulate further research.

We have also attempted to reduce the deficit in implementation research noted by many scholars (e.g., Noble 1999). In this chapter, we investigated the self-assessment process as essentially an “implementation technology.” Preliminary findings suggest that self-assessment may be an effective implementation technology under certain conditions.

Much of the research presented in this chapter was descriptive in content. We consider this a necessary early step in building a theory of self-assessment. Before much explanation and prediction can take place, we must first understand the self-assessment phenomenon and its salient properties and dimensions (Walton 1972). We defined a number of properties and dimensions in this chapter, including the model used in self-assessment and some of the dimensions that determine the model’s perceived value; the various self-assessment roles and the situation where all roles “converge” on a single organizational group; and the reporting and discussion venue, including the concept of the assessment meeting where results are discussed and action items are determined.

The self-assessment process contains elements that are readily related to the literature on organizational learning (e.g., Huber 1991). We have suggested that the degree of organizational learning obtained from self-assessment is directly related to the degree to which groups gather to discuss the assessment findings. The discussion generates information that encourages single- and double-loop learning (Argyris and Schon 1978). If the discussion progresses to dialogue (Isaacs 1993), then barriers that impede effective change implementation, sometimes referred to as defensive routines (Argyris 1985), are surfaced and understood.

It is difficult to find any mention in the literature of a self-assessment model where the roles of the organization, consultant/facilitator, and client “converge” on a single group. The
predominant model that we observed was one where senior management teams essentially assumed all three of these roles. They not only commissioned the self-assessment study (the “client” role), but they also gathered data from themselves through completing the survey instrument and analyzed the results (the “organization” and “consultant” roles). In other emerging self-assessment models, such as the one associated with Baldrige-based self-assessments (e.g., Latham 1997), these roles are played by different groups. The “convergent” model appears an innovation that merits further investigation in self-assessment research.

One outcome of the discussion generated during the self-assessment meeting appears to be a reduction in information asymmetry among members. We have argued here that this information leveling may improve consensus among managers. The notion of consensus has been a well-developed construct among scholars (Ginsberg 1990, Dess and Priem 1995, Hambrick 1997) but empirical research supporting the relationship between consensus and performance has produced mixed results (Bourgeois 1980, West and Schwenk 1996, Iaquinto and Fredrickson 1997, Knight et al. 1999). However, implementation variables have rarely been considered in these studies although their impact on realizing strategic change is large (Smith and Kofron 1996). Our preliminary findings suggest a significant relationship between consensus and performance when consensus is measured as the degree of agreement among managers on implementation variables.

The downstream consequences of self-assessment resemble concepts typically associated with managerial control systems (e.g., Anthony 1965, Lorange and Scott Morton 1976, Merchant 1985). Indeed, self-assessment can be viewed as contributing to managerial control structure. Self-assessment generates information that encourages action to revise the change process. Effective revision to the change process improves change achievement.

Crossing research in managerial control with change management research appears theoretically promising. The notion of managerial control systems (Anthony 1965, Merchant 1985, Simons 1995) is largely absent from the mainstream change management literature.
However, Chapters 3 and 4 suggest that managerial control is a valid and important construct in a model of change process. We have introduced the notion of *PROCESS INFLUENCE* as a potentially useful construct in elaborating the theoretical structure of managerial control systems in the change management context.

Our model proposes that the process of self-assessment and its consequences positively influence the achievement of change—mainly through the generation of diagnostic information that facilitates more accurate adjustment of change process levers. What are some plausible rival hypotheses to the one suggested by our model? As mentioned earlier, one plausible alternative is that change achievement merely occurs as a consequence of other activities related to a change’s implementation—regardless of whether a self-assessment is conducted. For example, training done as part of the change’s action plan for implementation merely moves the organization closer to change achievement.

Another plausible alternative is that the self-assessment event serves as a symbol or as a legitimation (Thompson 1967, Thompson and Tuden 1959) of the importance of change to the organization. Although many definitions of legitimation exist (Hybels 1995), it is often viewed as an appraisal of action in terms of shared values in the context of the involvement of the action in a social system (Parsons 1960: 175). Managers might use self-assessment to send a signal to lower level employees about what really matters to the organization. Or, self-assessment may be a tool for managers to address political issues in the organization (Brown 1994). Self-assessment might serve as a source of amassing or displaying power in social interactions (Giddens 1979, Sewell 1992). Managers might use the findings of self-assessment to verify or reinforce their previous actions, which may lead to favorable consequences for those managers, such as financial compensation or enhanced perception in the eyes of subordinates. Indeed, research suggests that various organizational systems and structure can be employed in some sort of legitimizing or symbolic capacity (e.g., Czarniawska-Joerges 1988).
5.8.3 Future research

Our previous remarks have suggested a number of research opportunities. Here we provide some closing remarks on future research.

Although we spent many hours in the field, we sometimes felt that our observations were a mile wide and an inch deep. Of course, qualitative researchers rarely feel as if they have enough data (Schatzman and Strauss 1973, Miles and Huberman 1994, Becker 1998) since they are constantly seeking additional theoretical comparisons. One problem we faced is that implementing organizational change takes time—sometimes lots of it. Effective data gathering in this regard required commitment to a longitudinal investigation that unfortunately required more time that we could afford here. More fieldwork is needed to trace the follow-up activities that stem from self-assessment. A clearer understanding of how initial actions intended to revise the change process progress through the organization and get executed (or die out) will improve the validity of the propositions generated in this study, as well as providing more conceptual density for the proposed consequences of self-assessment process. Implementing change involves working with complex social systems (Anthony 1965, Hrebeniak and Joyce 1984). Many variables that effect the execution of change strategies are possible. Careful longitudinal fieldwork is required to identify these dynamic aspects of change implementation.

Indeed, it is easy to see why implementation research lags other areas! Problems related to access, time, and measurability, along with the number of salient theoretical variables to manage, make implementation research extremely challenging.

More rigorous evaluation of the effects of self-assessment on change achievement is necessary. As we suggested in section 5.5, an experiment could be designed where some organizations receive the “treatment” of the self-assessment process, and other organizations serve as the “control” with no treatment. Surveys could be administered to both the trial and control group initially, and then once again after a period of time that would allow for the self-assessment treatment to take effect (perhaps 6-9 months). Analysis of variance (ANOVA)
techniques would allow separation of self-assessment effects from other activities that influence change achievement. This is assuming, of course, that we could design our two groups to control for other possible influencing variables, such as differences in the scope of the change being evaluated, the organizational learning tendencies of different organizations, and the ability of various organizations to translate information from self-assessment into effective process change (a.k.a. PROCESS INFLUENCE).

How often should self-assessments be conducted? The significant managerial attention requirements of the self-assessment process, and the lag between processes changes and their effect on results, suggest, hints of a relatively low frequency for conducting self-assessments. The preliminary longitudinal data obtained here required a 6-8 month interval before the organizations (and the researcher) both felt that an additional round of survey evaluations would be useful. This appears consistent with assessment frequencies in other contexts. For example, Baldrige-based assessments have rarely been reported at anything less than an annual frequency. Research, probably longitudinal in nature, is required to define the variables and consequences associated with self-assessment frequency.

What does it take to institutionalize a self-assessment process like the one we have defined inside an organization? Interestingly, none of the organizations that conducted the self-assessment events included in our investigation are using the process routinely. What are the factors that encourage or impede routine use? Beer and Eisenstat (1996) suggested that organizations lack the social technologies necessary for implementing many of administrative innovations. Tying research on institutionalizing self-assessment with previous work on managing innovation (Burns and Stalker 1961), particularly administrative innovations (Hage and Dewar 1973, Daft 1978, 1982, Daft and Becker 1978, Kimberly and Evanisko 1981) appears prudent.

Finally, we advise more research that crosses managerial control systems with change management. These two theoretical conversations have rarely intersected. However, our analysis
suggests that the successful implementation of change often rests on variables related to the managerial control construct. Interesting research is often generated when a concept from one theoretical domain is brought into another domain (Reisman 1988). This appears to be one of those times.
Chapter 6: Concluding Remarks

This investigation was motivated by two empirical phenomena: managers’ ongoing pursuit of technology to help them implement change, and the increasing tendency of organizations to self-assess their systems and performance. Although practitioner interest in these areas is significant, our theoretical understanding of these phenomena is underdeveloped.

In many ways this investigation was a Tale of Two Theses. In the first part of our study, we proposed a model of change process and explored its validity. Although a large number of change models have been developed (Burke 1995), relatively few have been rigorously validated. An important contribution of this study is that we were able to demonstrate the validity of a change process model from both a conceptual and measurement perspective. A valid model of change process is an important tool for advancing research in change implementation.

Indeed, certain characteristics of this change process model should be attractive for future research. The model is expressed in the context of a particular planned change. Change models focused around individual change initiatives are rare in the literature. This is interesting since the theoretical notion of planned change (Lippet, Watson, and Westley 1958) implies a deliberate identification of a change’s content and specific activities to ensure its implementation. Those change models that are expressed in the context of a particular planned change (e.g., Lewin 1958, Beckhard and Harris 1977) are usually at a high level of abstraction and not readily translated to a form that permits quantitative data gathering and analysis.

The seven theoretical categories that reflect our change process model (determining the content of the change, structuring the organization to support the change, developing the appropriate skills and capabilities, promoting the change, sharing successes related to the change, managing individual behavior, and monitoring and controlling the implementation) are not unique themselves. However, the specific combination of these categories into a common model is indeed unusual. The model elevates a number of variables typically buried in general scholarly
constructs of “structure” and “systems” into more prominent positions. For example, the model specifies variables related to promotional communication and managerial control—constructs that rarely appear as major variables in most academic change models.

The prominence of particular theoretical categories in this change process model should spark further inquiry. Although some categories of the model have been well researched, such as the process of change determination—particularly large-scale change (Ansoff 1965, Andrews 1971, Hofer and Schendel 1978), other categories have received relatively little attention in the context of change management research. For example, the theoretical category of managerial control systems (Anthony 1965, Ouchi 1977, Merchant 1985, Simons 1995), which was found significantly related to the achievement of change in this investigation, has received relatively little attention in the change management context.

Research using the existing model can take a number of directions. Initial work should extend our confidence in the measurement model’s validity. Due to the relatively low ratio of observations-to-variables present in this study, our findings suffered from some degree of over-fitting. The small sample size constrains our ability to generalize our findings to larger populations. In addition, we found the measurement model’s construct validity, the ability of the indicators to discriminate between the seven constructs of the change process model, to be mediocre relative to conventional standards. The model’s discriminatory power improved as we deleted indicators. The parsimony comes at a price, however, since removing indicators compromises content validity, thus challenging the model’s theoretical meaning. A larger number of respondents will facilitate more accurate assessment of the measurement model’s validity against conventional academic benchmarks.

Another portion of the model that requires attention is the output variable. Although the change process model exhibited considerable criterion-related validity (the ability of the process variables to predict or correlate with a variable of change achievement), it is fair to argue that the output construct was less than ideal. We strove for an output construct that captured the
multidimensional properties of change on organizational effectiveness suggested by scholars (e.g., Goodman and Pennings 1977, Cameron 1980). Of course, specifying such a multifaceted construct can wreak havoc on a measurement model’s unidimensionality. To improve unidimensionality, we reduced the number of output indicators considerably. The result was a construct with a purer psychometric orientation, thought to be desirable among some scholars (e.g., Nunnally 1967). The change achievement construct includes items that reflect the rater’s assessment of the change’s overall effect on the organization, rather than requiring a direct association to quantitative indicators of organizational performance (i.e., financial, productivity, etc.). Obtaining accurate measures of change output has been a chronic concern in change management research (see Zmud and Armenakis 1978 for one perspective). Although change output measures based on hard performance data such as productivity or financial performance seem desirable, such metrics are often unavailable or unrelated to the change being evaluated. Therefore, the use of subjective qualitative measures to measure organizational change has been encouraged by a number of scholars (Kilmann and Herden 1976, Lindell and Drexler 1979, Randolph 1982). Indeed, some researchers have employed self-reported measures of change output to generate insight in a number of interesting studies in change implementation (e.g., Nutt 1986, 1987, 1989, Miller 1997). Although the modifications made during the course of this investigation may indeed be desirable, further work is necessary to strengthen the content and construct validity of the change achievement construct.

The model’s current shortcomings should not prohibit its use in change management research. The measurement model can be employed to research a number of questions that would be difficult to evaluate without quantitative data. The findings of this study, for example, suggested that some variables of change process might matter more than others. The constructs of CHANGE DETERMINATION, SKILL DEVELOPMENT, BEHAVIOR MANAGEMENT, and CONTROL all demonstrated significant relationship to the achievement of change. Surprisingly, variables related to communications (PROMOTION and SUCCESS SHARING) offered little
unique explanatory power. Although we have repeatedly noted the need to consider the effects of multicollinearity in this model, the findings are interesting nonetheless and merit further investigation.

The model can also be used to explore various patterns or typologies in the change process variables that might exist. In our work, for example, we often observed a situation where organizations scored highly on constructs related to CHANGE DETERMINATION, STRUCTURAL SUPPORT, and PROMOTION, but low on categories related to BEHAVIOR MANAGEMENT and CONTROL. Indeed, such a pattern is similar to a category of “good change planning but poor change control” suggested by commentators speculating about the causes of poor change achievement and poor execution (e.g., Kotter and Schlesinger 1979, Eglehoff 1993, Colvin and Charan 1999). Our fieldwork prompts us to speculate that a number of common change process patterns or types may be discernable among organizational change initiatives.

It is also possible, if not highly likely, that the change’s content influences or relates to different change process variables. Indeed, Burke and Litwin (1992) proposed that certain variables in their change model would be more important for large scale change than for incremental change. For example, a merger or acquisition probably requires attention to different change process variables than would installation of a new piece of office equipment. Our measurement model could help test hypotheses about the relationships between change content and the levels and relationships of variables of change process.

The model could be employed to investigate relationships between change process, change achievement, and a variety of possible contextual and moderating variables. Contextual and moderating variables help us understand the limitations or conditions under which a theory applies—an important aspect of organization and management theory development (Whetten 1989). In addition to the change content identified above, other possible contextual variables include organization size, the leadership traits of senior management, the degree of turbulence in the organization’s environment, and the number of changes the organization has previously
implemented. Variables that might moderate the relationship between change process and change achievement include the ease by which competitors can observe and imitate the new behavior (thus reducing the impact of the change on certain aspects of organizational performance), and the tendency for political processes to influence organizational change activities.

In the second part of our study, we proceeded to investigate the change process model’s use by organizations to self-assess change initiatives and change processes. Since the literature on self-assessment has established relatively few theoretical precedents, we shifted our research approach to a more exploratory stance. Exploratory methods are appropriate when few research paths have been previously specified (Walton 1972). Our primary objective was to synthesize a provisional theoretical framework as a foundation for further inquiry. We generated a number of propositions about salient variables of self-assessment process, its antecedents, and consequences (Figure 5.4). We were careful to incorporate facets of accepted qualitative research methodology in our investigation (e.g., Glaser and Strauss 1967, Straus 1987, Eisenhardt 1989, Miles and Huberman 1994, Yin 1994). However, since our research orientation was primarily exploratory, we placed more emphasis on the usefulness of the insights and on the generation of propositions that fit reality rather than on structured research process (Sofer 1959).

For organizations that self-assess their change initiatives, a critical theoretical category relates to the venue for reporting and discussing the assessment findings. When organizational members, particularly senior managers, gather to discuss the assessment findings, organizational learning (Argyris and Schon 1978, Huber 1991, Isaacs 1993) is encouraged. The information generated can be applied towards better implementation of the existing change initiative, and the improvement of the change process for future initiatives. Importantly, if there is little or no discussion of the results among organization members, the effectiveness of the self-assessment process is predicted to be minimal. This extends the work of Latham (1997) whose findings suggested the importance of the written feedback report to the effectiveness of Baldrige-based self-assessments. Our findings suggest that active exchange between managers—such as that
obtained in a group meeting—is necessary to benefit significantly from the self-assessment process.

The roles played by the organization as part of the self-assessment events that we witnessed differed from those widely treated in the organizational assessment literature. The predominant model that we observed was one where the senior management team assumed all three roles conventionally specified in the literature. The managers not only commissioned the self-assessment study (the “client” role), but they also gathered data from themselves through completing the survey instrument, and then analyzed the results (the “organization” and “consultant”). In other emerging self-assessment models, such as the one associated with Baldrige-based self-assessments, these roles are played by different groups. The “convergent” model appears to be an innovation that merits further investigation in self-assessment research.

It was natural to relate our self-assessment model to the concept of managerial control systems (Anthony 1965, Merchant 1985, Simons 1995). For one, the importance of managerial control in the achievement of change—as suggested by the findings in the first part of our investigation—was fresh in our minds. In addition, our provisional model of self-assessment and its consequences contained elements that closely resembled the salient elements of a managerial control system (Figure 5.7): generation of information about the degree of congruence between reality and the objective, influencing revision or change in the process when suggested by the information, and achieving sufficient goal congruence (Anthony 1965).

We suggested a theoretical construct meant to reflect the organization’s ability to influence revision or adjustment of organizational processes. PROCESS INFLUENCE bridges the chasm between acquiring information and effective change process adjustment. Theoretically, two organizations with identical information systems but different levels of process influence are proposed to realize different levels of change achievement. The notion of process influence merits further thought, since the construct captures dynamic dimensions of implementation and change management that have been difficult to understand.
We have attempted to suggest why an organization might use self-assessment, and that a positive relationship exists between the use of a self-assessment process and the achievement of change. Our provisional explanation draws mainly from theory in organizational learning and managerial control systems. Essentially, self-assessment facilitates organizational learning and generates information that enhances the organization’s ability to adjust the change process for better change achievement.

Plausible rival explanations stem from the notions of intentionality and legitimation in the organizational literature (Thompson and Tuden 1959, Thompson 1967). A self-assessment event may serve symbolize or validate of the importance of change to the organization. Although many definitions of legitimation exist (Hybels 1995), it is often viewed as an appraisal of action in terms of shared values in the context of the involvement of the action in a social system (Parsons 1960: 175). Managers might use self-assessment to send a signal to lower level employees about what really matters to the organization. As these values and signals are demonstrated during self-assessment events, lower level employees obtain an idea of what is important or what needs to be done.

Self-assessment may be a tool for managers to address political issues in the organization (Brown 1994); it may provide a resource for amassing or displaying power in social interactions (Giddens 1979, Sewell 1992). Managers might use the findings of self-assessment to verify or to reinforce previous actions, which may lead to favorable consequences for those managers, such as financial compensation or enhanced perception in the eyes of subordinates (Thompson 1967). Empirical research suggests that various organizational systems and structure can be employed in some sort of legitimizing, symbolic, or power capacity (e.g., Czarniawska-Joerges 1988).

Finally, self-assessment may be conducted to appease powerful entities in the organization’s external environment (Thompson 1967, Pfeffer and Salancik 1978). It could be argued, for example, that the organizations that conducted self-assessments for this study did so merely to satisfy the CQM organization at large. To a degree, ongoing membership in the CQM
organization depends on the member’s participation in research and social networking events. Managers from other CQM member organizations may exert peer pressure on colleagues to participate in the study group’s research activities, or to utilize the tool that was collectively developed by the consortium. Drawing on the notion from previous paragraphs, use of the self-assessment process could help legitimize the CQM research process among member organizations. It is plausible that the CQM organization would attempt to influence its members to utilize the technologies developed through the study group process to legitimize the consortium’s value in the eyes of its members.

As with most plausible rival theories, all of these conjectures likely possess some degree of validity. Further research could shed light on situations under which we can expect self-assessment to be conducted according to the various underlying motivators. Further research should also be able to inform us about the impact of these various motivators on downstream consequences, such as the achievement of change. Longitudinal investigation, most likely employing case-based or other qualitative research methods will be necessary to illuminate these issues.

We know little about the institutionalization of the self-assessment process inside organizations. Currently, none of the organizations that conducted the self-assessment events included in our investigation are using the process routinely. Beer and Eisenstat (1996) suggested that organizations lack the social technologies necessary for implementing many administrative innovations. Tying research on institutionalizing self-assessment with previous work on managing innovation (Burns and Stalker 1961), particularly administrative innovations (Hage and Dewar 1973, Daft 1978, 1982, Daft and Becker 1978, Kimberly and Evanisko 1981), seems prudent.

We have also attempted to reduce the deficit in implementation research noted by many scholars (e.g., Noble 1999). In this chapter, we investigated the self-assessment process as
essentially an “implementation technology.” Preliminary findings suggest that self-assessment may be an effective implementation technology under certain conditions.

Finally, we advise more research that crosses managerial control systems with change management. These two theoretical conversations have rarely intersected. However, our analysis suggests that the successful implementation of change often rests on variables related to the managerial control construct. In the empirical world, the notion of “execution”—the ability to deliver effective results from plans, promises, and programs—has been assuming a prominent and well-regarded position in the management lexicon. Monitoring a change’s implementation, and effectively adjusting change process variables when implementation requires improvement, seems a critical component in an organization’s ability to execute.

It is our hope that this investigation stimulates further inquiry towards advancing our technology for managing change.
References


Tannenbaum, R. (1971). Organizational change has to come through individual change. *Innovation*, 23: 36-43.


Appendix 1: CQM Survey – Executive Version 4.0

1. GOAL SETTING: The degree to which the objective was understood.

1.1 Was fact-based data used to identify the need for change?
Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>No attempt was made to collect data prior to making a decision to change.</td>
</tr>
<tr>
<td>2</td>
<td>Some data was collected but little analysis was done.</td>
</tr>
<tr>
<td>3</td>
<td>A reasonable attempt was made to collect and analyze data prior to deciding the change was needed.</td>
</tr>
<tr>
<td>4</td>
<td>A comprehensive analysis of fact-based data seemed to substantiate the need for change.</td>
</tr>
<tr>
<td>5</td>
<td>The need for change resulted directly from extensive data-driven analysis.</td>
</tr>
</tbody>
</table>

1.2 Did organization leaders evaluate the current condition (financial, competition, labor, etc) prior to setting goals for the change?
Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>No effort was made to assess current conditions prior to setting goals.</td>
</tr>
<tr>
<td>2</td>
<td>An evaluation was made of a few areas based primarily on opinion.</td>
</tr>
<tr>
<td>3</td>
<td>A reasonable attempt was made to evaluate the current state based on available facts.</td>
</tr>
<tr>
<td>4</td>
<td>A comprehensive, fact-based evaluation of multiple aspects of the organization was completed.</td>
</tr>
<tr>
<td>5</td>
<td>A complete, fact-based evaluation of the organization resulted in a commonly shared view of current conditions.</td>
</tr>
</tbody>
</table>

1.3 Was the gap between “where we are” and “where we want to be” determined?
Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>No attempt was made to define the distance from here to there.</td>
</tr>
<tr>
<td>2</td>
<td>Some casual discussion in general terms took place.</td>
</tr>
<tr>
<td>3</td>
<td>Some objective comparison of specifics was done and documented.</td>
</tr>
<tr>
<td>4</td>
<td>The gap was translated into measurable terms.</td>
</tr>
<tr>
<td>5</td>
<td>The extent of measurable change required to get from here to there was clearly defined for all key people.</td>
</tr>
</tbody>
</table>

1.4 Was feedback from affected people (customers, employees, shareholders, suppliers, etc.) included in the goal-setting process?
Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>Feedback was not collected in the goal setting process.</td>
</tr>
<tr>
<td>2</td>
<td>Feedback was collected but not used.</td>
</tr>
<tr>
<td>3</td>
<td>Feedback was collected and some was used.</td>
</tr>
<tr>
<td>4</td>
<td>Feedback was collected and helped shape the goals.</td>
</tr>
<tr>
<td>5</td>
<td>Feedback collected throughout the process resulted in widespread support for the goals.</td>
</tr>
<tr>
<td>6</td>
<td>Doesn’t apply</td>
</tr>
</tbody>
</table>
1.5 Was the goal of the change clearly stated?
Evidence:

0. Don’t know
1. No effort was made to define the goal.
2. An overall description of the goal was made.
3. An overall description of the goal was made and some key pieces were explained.
4. All elements of the goal were thoroughly explained.
5. There was a clear explanation of the goal and its elements and it was widely understood.

2.0 ORGANIZATION SETTING: The degree to which the resources and support structures were in place to initiate the change.

2.1 Were the necessary resources (i.e. time, space, funding, etc.) provided to support the change effort?
Evidence:

0. Don’t know
1. No thought was given to resource needs.
2. A need for resources was identified, but none were provided.
3. Some resources were made available.
4. Most resources were provided.
5. A full range of resources was made easily accessible.

2.2 Was an action plan developed for making the change?
Evidence:

0. Don’t know
1. There was no plan.
2. Some action items were identified, but it was not clear who was responsible.
3. Some action items and individual responsibilities were defined.
4. A complete list of action items and individual responsibilities were defined.
5. A workable action plan resulted in individuals who were committed to follow through.

2.3 Was a timeline for successful completion established?
Evidence:

0. Don’t know
1. No timeline was developed.
2. A general date for the completion of the change exists.
3. Important deadlines were set, but the chance of meeting them seemed unlikely.
4. Important deadlines were set, and the chance of meeting them seemed possible.
5. A realistic timeline was set after considering potential obstacles.
Appendix 1 (cont’d)

2.4 Were the organization’s priorities communicated to guide decisions during implementation?
Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>No priorities were communicated.</td>
</tr>
<tr>
<td>2</td>
<td>Priorities were communicated to a few people.</td>
</tr>
<tr>
<td>3</td>
<td>Priorities were communicated throughout the organization.</td>
</tr>
<tr>
<td>4</td>
<td>Priorities were communicated throughout the organization and were sometimes used to guide decisions.</td>
</tr>
<tr>
<td>5</td>
<td>The organization’s priorities guided decisions.</td>
</tr>
</tbody>
</table>

2.5 Did the organization examine and adjust (as needed) standard policies and procedures to support the change effort?
Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>Policies and procedures were not reviewed.</td>
</tr>
<tr>
<td>2</td>
<td>Policies were examined and some adjustments were necessary, but never made.</td>
</tr>
<tr>
<td>3</td>
<td>Policies and procedures were examined and some necessary adjustments were made.</td>
</tr>
<tr>
<td>4</td>
<td>Policies and procedures were examined and most needed changes were made.</td>
</tr>
<tr>
<td>5</td>
<td>A systematic review resulted in all necessary policy or procedural changes being made.</td>
</tr>
</tbody>
</table>

3.0 TRAINING AND EDUCATION: The degree to which the capabilities were in place to accomplish the change.

3.1 Did organization leaders identify important skills and capabilities needed to make the change?
Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>No attempt was made to do so.</td>
</tr>
<tr>
<td>2</td>
<td>A few skills were identified.</td>
</tr>
<tr>
<td>3</td>
<td>Some critical skills and capabilities were identified.</td>
</tr>
<tr>
<td>4</td>
<td>Most important skills and capabilities were identified.</td>
</tr>
<tr>
<td>5</td>
<td>All important skills and capabilities were identified.</td>
</tr>
</tbody>
</table>

3.2 Did the organization develop necessary skills and capabilities through training, mentoring, outside acquisition or other means?
Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>Development of the needed skills and capabilities was not considered.</td>
</tr>
<tr>
<td>2</td>
<td>Informal discussions took place but didn’t result in coordinated action to obtain the needed skills.</td>
</tr>
<tr>
<td>3</td>
<td>Some skills were matched with a means of obtaining them.</td>
</tr>
<tr>
<td>4</td>
<td>Most skills and capabilities were matched with a means of obtaining them.</td>
</tr>
<tr>
<td>5</td>
<td>A comprehensive plan was developed and executed for obtaining the necessary skills and capabilities.</td>
</tr>
</tbody>
</table>
3.3 Did the organization make sure that needed skills and capabilities were in place in time to complete the changes?
Evidence:

<table>
<thead>
<tr>
<th></th>
<th>0. Don’t know</th>
<th>1. Not in time</th>
<th>2. Rarely were needed skills in place in time</th>
<th>3. Sometimes they were in place in time</th>
<th>4. Often the skills and capabilities were in place in time to complete the changes</th>
<th>5. Consistently needed skills and capabilities were in place in time to complete the changes</th>
</tr>
</thead>
</table>

3.4 Did the training and education provided help people succeed with the change?
Evidence:

<table>
<thead>
<tr>
<th></th>
<th>0. Don’t know</th>
<th>1. Training and education was not provided.</th>
<th>2. The training provided did not relate to the change.</th>
<th>3. Some of the training was useful.</th>
<th>4. Most of the training was useful</th>
<th>5. The training clearly contributed to the success of the change</th>
</tr>
</thead>
</table>

4.0 PROMOTION: The degree to which the change objectives and activities were communicated to the organization.

4.1 Was the need for this change widely communicated throughout the company?
Evidence:

<table>
<thead>
<tr>
<th></th>
<th>0. Don’t know</th>
<th>1. The need for change was not communicated.</th>
<th>2. The need for change was communicated to a few individuals.</th>
<th>3. The need for change was communicated to a few groups within the organization.</th>
<th>4. The need for change was communicated throughout the organization.</th>
<th>5. The need for change was clearly stated and is widely accepted throughout the organization.</th>
</tr>
</thead>
</table>

4.2 Were managers supportive of the change effort?
Evidence:

<table>
<thead>
<tr>
<th></th>
<th>0. Don’t know</th>
<th>1. Managers did not support the change effort.</th>
<th>2. Some managers said things in support of the change, but did not act accordingly.</th>
<th>3. Some managers appeared to act in ways consistent with the change.</th>
<th>4. Most managers acted in ways consistent with the change.</th>
<th>5. Managers led by example.</th>
</tr>
</thead>
</table>
Appendix 1 (cont’d)

4.3 Were employees kept informed about the ongoing status of the change process?

Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>Employees were not kept informed of the status of the change.</td>
</tr>
<tr>
<td>2</td>
<td>Some employees were informed about the status of the change effort.</td>
</tr>
<tr>
<td>3</td>
<td>Most employees were informed about the status of the change effort.</td>
</tr>
<tr>
<td>4</td>
<td>All employees were regularly informed about the status of the change effort.</td>
</tr>
<tr>
<td>5</td>
<td>All employees were well informed about the change effort, and could clearly explain its status.</td>
</tr>
</tbody>
</table>

5.0 SHARING OF SUCCESS STORIES: The degree to which positive activities and results were shared with the organization.

5.1 How well were successes of the change effort communicated?

Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>No communication of successes occurred.</td>
</tr>
<tr>
<td>2</td>
<td>Some results were shared informally.</td>
</tr>
<tr>
<td>3</td>
<td>A defined process was occasionally used to communicate successes.</td>
</tr>
<tr>
<td>4</td>
<td>A standard process was often used to communicate successes.</td>
</tr>
<tr>
<td>5</td>
<td>A standard process to communicate successes was used and has become the norm.</td>
</tr>
</tbody>
</table>

5.2 Were successful change results shared in a timely fashion?

Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>Success stories were not shared.</td>
</tr>
<tr>
<td>2</td>
<td>Successes were shared, but too late to be useful.</td>
</tr>
<tr>
<td>3</td>
<td>Successes were sometimes shared on a timely basis.</td>
</tr>
<tr>
<td>4</td>
<td>Successes were always shared on a timely basis.</td>
</tr>
<tr>
<td>5</td>
<td>The timing of success stories built momentum for the change.</td>
</tr>
</tbody>
</table>

5.3 Were senior managers visibly involved in the process of sharing success stories?

Evidence:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don’t know</td>
</tr>
<tr>
<td>1</td>
<td>They were not involved in the communication of successful results.</td>
</tr>
<tr>
<td>2</td>
<td>Senior managers allowed presentations, but rarely contributed.</td>
</tr>
<tr>
<td>3</td>
<td>They were visible and usually made comments to show their support.</td>
</tr>
<tr>
<td>4</td>
<td>Senior managers took an active role in sharing success stories.</td>
</tr>
<tr>
<td>5</td>
<td>Senior management’s enthusiastic involvement led to increased participation of others.</td>
</tr>
</tbody>
</table>
5.4 Were important lessons learned shared across the organization?
Evidence:

0. Don’t know
1. No sharing took place.
2. Some informal sharing occurred among a few people.
3. Some lessons learned were recorded and made available to anyone who was interested.
4. Lessons learned were delivered to employees.
5. Lessons learned were rapidly assimilated throughout the organization.

6.0 INCENTIVES AND REWARDS: The degree to which behavior consistent with the change was reinforced and recognized.

6.1 Were new roles and responsibilities established for employees as a way to “cement” the change?
Evidence:

0. Don’t know
1. There was no discussion of new roles or responsibilities.
2. Expected changes in roles and responsibilities were defined for some people.
3. The expected changes were defined for most people.
4. Most people understood the new roles and responsibilities.
5. New roles and responsibilities were established and resulted in behaviors that were consistent with the new roles.

6.2 How was individual performance reviewed?
Evidence:

0. Don’t know
1. There was no effort to review performance.
2. Performance reviews occurred for only a few employees.
3. Performance review sessions occurred with most employees.
4. Performance was systematically reviewed throughout the organization.
5. Performance reviews occurred as a matter of course and individual behavior was reinforced or adjusted as appropriate.

6.3 Were employees rewarded for working to support the change effort?
Evidence:

0. Don’t know
1. No recognition was given.
2. Some rewards were given but weren’t linked to the goals of the change.
3. Some people received rewards based on their support of the change.
4. Most people received rewards based on their support of the change.
5. Employees received consistent and timely rewards that clearly moved the change forward.
6.4 Were organization leaders held accountable for their behavior related to the change?
Evidence:

0. Don’t know.
1. No negative consequences were defined.
2. Negative consequences were defined, but not enforced.
3. Negative consequences were randomly enforced.
4. The threat of negative consequences stimulated compliance with the change effort.
5. Methods for holding organization leaders accountable resulted in full compliance with the change effort.

7.0 DIAGNOSIS AND MONITORING: The degree to which the change process was evaluated and corrections were made.

7.1 Was information about the progress of the change obtained?
Evidence:

0. Don’t know.
1. No information was obtained.
2. Managers occasionally obtained information about the change by special request.
3. Information about the change was sometimes obtained from reports or meetings.
4. Managers obtained information about the change from regularly scheduled reports or meetings.
5. Information was regularly obtained, and it was effectively used to evaluate the progress of the change.

7.2 Was information effectively used to enable corrective action when necessary?
Evidence:

0. Don’t know.
1. Information collected was not used for corrective action.
2. Corrective action was based on intuition rather than on information about the change.
3. Corrective action appeared necessary, but available information did not enable effective adjustment of the process.
4. Collected information was frequently used to drive corrective action.
5. Information collected resulted in precise adjustments to the process.

7.3 How effective were the actions taken to correct the progress of the change?
Evidence:

0. Don’t know.
1. Corrective actions taken usually made progress worse.
2. Corrections made little or no impact to the progress of the change.
3. Some corrective actions were effective, but others were ineffective.
4. Most corrections resulted in improved progress.
5. Corrective actions clearly improved implementation of the change.
Appendix 1 (cont’d)

7.4 Was the process the organization used to implement the change reviewed for improvement?
Evidence:

<table>
<thead>
<tr>
<th>0. Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It was not reviewed for improvement.</td>
</tr>
<tr>
<td>2. It was casually discussed.</td>
</tr>
<tr>
<td>3. A partial review of the process was conducted.</td>
</tr>
<tr>
<td>4. A thorough review was conducted.</td>
</tr>
<tr>
<td>5. A comprehensive review was conducted and the process was validated or improved as needed.</td>
</tr>
</tbody>
</table>

8.0 ACHIEVEMENT OF RESULTS: The degree to which desired results were realized from the change.

8.1 Did the change have a positive impact on business results?
Evidence:

<table>
<thead>
<tr>
<th>0. Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There was no evidence that the change impacted business results.</td>
</tr>
<tr>
<td>2. Anecdotal evidence suggested some impact on business results, but its extent couldn’t be determined.</td>
</tr>
<tr>
<td>3. Some objective data suggested a moderate impact on business results.</td>
</tr>
<tr>
<td>4. A strong link between positive business results and the change was demonstrated.</td>
</tr>
<tr>
<td>5. It is undeniable that positive business results accumulated as a result of the change.</td>
</tr>
</tbody>
</table>

8.2 To what extent did the change achieve cost goals?
Evidence:

<table>
<thead>
<tr>
<th>0. Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all.</td>
</tr>
<tr>
<td>2. 25% of our cost goals were achieved.</td>
</tr>
<tr>
<td>3. 50% of our cost goals were achieved.</td>
</tr>
<tr>
<td>4. 75% of our cost goals were achieved.</td>
</tr>
<tr>
<td>5. The change met or exceeded cost objectives.</td>
</tr>
</tbody>
</table>

8.3 Was the change effort on schedule?
Evidence:

<table>
<thead>
<tr>
<th>0. Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. We had no implementation schedule.</td>
</tr>
<tr>
<td>2. Implementation rarely met schedule requirements.</td>
</tr>
<tr>
<td>3. Implementation occasionally met schedule requirements.</td>
</tr>
<tr>
<td>4. Implementation often met schedule requirements.</td>
</tr>
<tr>
<td>5. The change met or exceeded schedule requirements.</td>
</tr>
</tbody>
</table>
8.4 To what extent has the change resulted in expected behaviors?
Evidence:

0. Don’t know
1. There were no observable changes in behavior.
2. A few minor changes in behavior were observed.
3. Some changes were evident.
4. Many significant changes in behavior occurred.
5. Expected behaviors were widely demonstrated as a result of the change.

8.5 Overall, how satisfied were you with the changes?
Evidence:

0. Don’t know
1. I was very dissatisfied.
2. I was a little disappointed.
3. I was neither dissatisfied nor satisfied.
4. I was generally satisfied.
5. This change exceeded my expectations.

8.6 Overall, how satisfied were you with how implementation was done?
Evidence:

0. Don’t know
1. I was very dissatisfied.
2. I was a little disappointed.
3. I was neither dissatisfied nor satisfied.
4. I was generally satisfied.
5. The way the implementation was done exceeded my expectations.
Appendix 2: Correlation Matrix of Measurement Model Indicators

X11
X12
X13
X14
X15
X21
X22
X23
X24
X25
X31
X32
X33
X34
X41
X42
X43
X51
X52
X53
X54
X61
X62
X63
X64
X71
X72
X73
X74
X81
X82
X83
X84
X85
X86

X11 X12 X13 X14 X15 X21 X22 X23 X24 X25 X31 X32 X33 X34 X41 X42 X43
1.00
0.62 1.00
0.58 0.60 1.00
0.35 0.52 0.46 1.00
0.37 0.60 0.47 0.67 1.00
0.18 0.25 0.09 0.37 0.37 1.00
0.08 0.33 0.08 0.41 0.50 0.54 1.00
0.12 0.32 0.25 0.30 0.39 0.46 0.65 1.00
0.15 0.32 0.16 0.44 0.53 0.58 0.59 0.39 1.00
0.32 0.38 0.40 0.40 0.46 0.32 0.34 0.37 0.48 1.00
0.18 0.20 0.24 0.37 0.34 0.57 0.23 0.27 0.52 0.39 1.00
0.08 0.07 0.10 0.25 0.19 0.53 0.21 0.20 0.36 0.43 0.73 1.00
0.11 0.14 0.16 0.29 0.23 0.43 0.26 0.25 0.42 0.36 0.53 0.64 1.00
0.09 0.13 0.09 0.31 0.27 0.52 0.26 0.26 0.43 0.30 0.53 0.66 0.49 1.00
0.18 0.40 0.18 0.43 0.40 0.35 0.31 0.13 0.42 0.41 0.23 0.24 0.26 0.30 1.00
0.40 0.50 0.33 0.46 0.46 0.40 0.30 0.33 0.47 0.42 0.38 0.29 0.28 0.31 0.51 1.00
0.32 0.41 0.31 0.43 0.37 0.44 0.32 0.29 0.32 0.44 0.42 0.44 0.26 0.34 0.55 0.57 1.00
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Appendix 3: Empirical Articles Reviewed During This Investigation


2/21/00. A talk with the man who got Rayovac all charged up. Business Week. Perterson, T.: 32F-32H.
3/6/00. The customer is the decision-maker. Fortune. Schlender, B.: F84-F86.


