I, Shang-Yen Lin, hereby submit this original work as part of the requirements for the degree of Master of Design in Design.

It is entitled:
Design for Unfamiliar Cultures

Student's name: Shang-Yen Lin

This work and its defense approved by:

Committee chair: Gerald Michaud, M.A.

Committee member: Peter Chamberlain, M.F.A., M.Phil.

Committee member: Michael Roller, M.Des.
Design for Unfamiliar Cultures

A thesis submitted to the Graduate School
College of Design, Architecture, Art, and Planning
of the University of Cincinnati
in partial fulfillment of the
requirements for the degree of

Master of Design

in the Department of Industrial Design
of the College of Design, Architecture, Art, and Planning

by

Shang-Yen Lin
March 13, 2015

B.S., Department of Industrial Design,
Ming-Chi University of Technology, Taiwan, 2009

Committee: Gerald Michaud, Chair
Abstract

Since we live in a global marketplace, designers do not only design for domestic consumers, but also design for international users. In this paper, I am proposing The Product Value System, an integrated design approach that is able to provide an appropriate design direction for industrial designers when dealing with an unfamiliar culture. This paper will introduce different viewpoints of culture, and how The Product Value System can be used for an industrial design project. In the end, the testing results and limitations of the tested project will be shown.
Acknowledgements

First of all, I would like to extend my sincere gratitude to Professor Gerald Michaud for his patient instructive encouragement, suggestions, and for taking care of every detail of my thesis. He walked me through all the stages of my thesis. Without his consistent and illuminating instruction, this thesis could not have reached its present form.

I am also deeply indebted to Professor Peter Chamberlain and Michael Roller, who have instructed and helped me a lot in my thesis semesters. They gave me a lot of useful information and examples, and they also offered me valuable suggestions.

Special thanks for people, who spent their time to join my thesis survey, and provided me thoughtful feedbacks.

In the end, I am indebted to my parents for their continuous support and encouragement.
# Table of contents

Abstract .............................................................................................................................................. 2

Acknowledgement ............................................................................................................................ 4

Chapter 1  Introduction

1.1 Problem Statement .................................................................................................................... 11

1.2 Purpose and Research Questions .......................................................................................... 11

Chapter 2  Literature Review

2.1 Cultures and Culture Difference ............................................................................................ 12

2.1.1 The Importance of Culture in Industrial Design .............................................................. 12

2.1.2 Defining Culture ................................................................................................................ 13

2.1.3 Culture as A Tool of Perception ....................................................................................... 18

2.2 The Chinese Culture

2.2.1 Religion and Philosophy of Chinese culture .................................................................. 24

2.2.2 Chinese Culture Value .................................................................................................... 27

Chapter 3  A Practical Project by Using The Product Value System

3.1 The Product Value System: People Needs (Rituals) ............................................................. 29

3.2 The Product Value System: Affordance (Symbol)

3.2.1 Color Analysis .................................................................................................................. 32

3.2.2 Form Analysis .................................................................................................................. 33

3.3 Material Analysis ................................................................................................................... 34

3.3 The Product Value System: Brand (Hero)

3.3.1 KitchenAid Brand Analysis: Color ................................................................................. 35

3.3.2 KitchenAid Brand Analysis: Form .................................................................................... 36
3.3.3 KitchenAid Brand Analysis: Material.................................37

3.4 The Portable Coffee Maker Design Process
3.4.1 The Portable Coffee Maker Design Process:
   Concept Development...........................................................39
3.4.2 The Portable Coffee Maker Design Process:
   Prototype Making...................................................................40
3.4.3 The Portable Coffee Maker Design Process:
   3D Modeling........................................................................42
3.4.4 The Portable Coffee Maker Design Process:
   3D Rendering........................................................................43
3.4.5 The Portable Coffee Maker Design Process:
   Physical Model Making......................................................44
3.4.6 The Portable Coffee Maker Design Process:
   How It Works........................................................................45

Chapter 4 Testing and Result.........................................................46
4.1 Q1: I Like This Design...........................................................48
4.2 Q2: It Looks Easy to Use......................................................49
4.3 Q3: This Product Fits In My Daily Life.................................50
4.4 Q4: Which Culture This Product Looks Like? .........................51
4.5 Q5: Which Brand This Product Looks Like? .........................52
4.6 Q6: This Product Will Cut Into American Market...............54
4.7 Q7: Do You Want to Buy It? ..............................................55
4.8 Q8: If NO, Why? ..............................................................56
4.9 Q9: Any Suggestion or Improvement of This Product? ..........................56

Chapter 5 Conclusion..................................................................................................57

Bibliography..................................................................................................................61
List of Figures

Fig. 2.1: Framework for Consumer Response to The Visual Domain in Product Design. (Crilly, Nathan; Moultrie, James; Clarkson, P. John, 2004) .......................................................... 13

Fig. 2.2: Schematic Models of Influences on Cognitive Process. (Nisbett, 2003) .......... 19

Fig. 2.3: The Model of The Interaction of Culture and Consumer Behavior (Luna; Gupta, 2001) ........................................................................................................................................... 21

Fig. 2.4: The Conversion From Culture Value System to The Product Value System for Unfamiliar Cultures .................................................................................................................. 24

Fig. 2.5: Tai-Ji, The Combination of Yin and Yan.............................................................. 25

Fig. 2.6: Tai-Ji With Sixiang .......................................................................................... 26

Fig. 2.7: Ba-Gua, The Eight Trigrams ......................................................................... 26

Fig. 2.8: Ba-Gua With Sixiang and Tai-Ji.................................................................... 26

Fig. 3.1: The Product Value System .............................................................................. 29

Fig. 3.2: 2013 State of The Vending Industry Report ................................................. 30

Fig. 3.3: 2014 National Coffee Drinking Trends – 1 .................................................. 31

Fig. 3.4: 2014 National Coffee Drinking Trends – 2 .................................................. 31

Fig. 3.5: Color Analysis ............................................................................................... 32

Fig. 3.6: Form Analysis ............................................................................................... 33

Fig. 3.7: Material Analysis ........................................................................................... 34

Fig. 3.8: KitchenAid Analysis: Color ........................................................................... 35

Fig. 3.9: KitchenAid Analysis: Form ........................................................................... 36

Fig. 3.10: KitchenAid Analysis: Material .................................................................... 37

Fig. 3.11: Concept Development – 1 ........................................................................... 39
Fig. 3.12: Concept Development – 2

Fig. 3.13: Prototype Making – 1

Fig. 3.14: Prototype Making – 2

Fig. 3.15: Prototype Making – Four Prototypes

Fig. 3.16: Prototype Making – Final Decision

Fig. 3.17: 3D Modeling – External Model

Fig. 3.18: 3D Modeling – Internal Model

Fig. 3.19: 3D Rendering – External Model

Fig. 3.20: 3D Rendering – External Model with Internal Model

Fig. 3.21: Physical Model Making – Sanding Powder Printed Models

Fig. 3.22: Physical Model Making – Painting

Fig. 3.23: Physical Model Making – Final External and Internal (with K-Cup) Models

Fig. 3.24: How It Works – 1

Fig. 3.24: How It Works – 2

Fig. 4.1: Product Testing Questionnaire

Chart 4.1: Product Testing Questionnaire, Q1 – 1

Chart 4.2: Product Testing Questionnaire, Q1 – 2

Chart 4.3: Product Testing Questionnaire, Q2 – 1

Chart 4.4: Product Testing Questionnaire, Q2 – 2

Chart 4.5: Product Testing Questionnaire, Q3 – 1
Chart 4.6: Product Testing Questionnaire, Q3 – 2...............................................................50
Chart 4.7: Product Testing Questionnaire, Q4 – Design Background.........................51
Chart 4.8: Product Testing Questionnaire, Q4 – None-Design Background...............51
Chart 4.9: Product Testing Questionnaire, Q5 – Design Background.......................52
Chart 4.10: Product Testing Questionnaire, Q5 – None-Design Background.............53
Chart 4.11: Product Testing Questionnaire, Q6 – 1..............................................................54
Chart 4.12: Product Testing Questionnaire, Q6 – 2..............................................................54
Chart 4.13: Product Testing Questionnaire, Q7 – Design Background.......................55
Chart 4.14: Product Testing Questionnaire, Q7 – None-Design Background.............55
Chart 5.1: Interview Age Groups – Design Background..............................................58
Chart 5.2: Interview Age Groups – None-Design Background....................................58
Chart 5.3: Interview Age Groups – Total.........................................................................59
Chapter 1: Introduction

1.1 Problem Statement

Design, is one of the main factors that is able to create value and achieve business success in the global marketplace. As an industrial designer, we visually communicate forms, materials, and colors. These aspects are part of our social life, and come together with a various range of meanings. In the design field, “Culture” takes a significant place. Therefore, when industrial designers create a product for local users, or involve culture into a modern product, we ought to better understand the local adaptation and meaning making, which means designers should realize how the end-users interpret, localize, and integrate with the objects in their daily life, and how culture influences consumer’s behavior. This phenomenon is a crucial in the global market, and “cross-cultural design” will be a key design evaluation in the future. While cross-cultural factors become the important issues for design in the global economy, the intersection of design and culture becomes a concern that make both local design and the global market worthy of further in-depth study.

1.2 Purpose and Research Questions

The purpose of this thesis is to explore a framework that allows industrial designers to design for unfamiliar cultures. In this research, two goals will be studied:

a. How does the culture difference affect the design outcomes?

b. And how to create the product value for an unfamiliar culture?
2.1 Cultures and Culture Difference

“The measure of a civilization is the strength of its culture, and this is personified in the signification of its cultural identity and cultural objects.” Brent Richards\(^1\) says. In the international marketplace nowadays, designers are faced with variety audience. Thus, we need to understand the people needs before solving the problems; especially, to create the cultural identity outcomes in the end of design process. Based on this notion, it is important for industrial designers to be aware of culture differences, and to get the ideas of how culture should cooperate with design and then affects our life. This chapter introduces the researches into culture differences.

2.1.1 The Importance of Culture in Industrial Design

According to the “Framework for consumer response to the visual domain in product design”\(^2\), a consumer’s preferences of a tangible object are not only oriented by personal and situational factors, but also are moderated by culture influences. Those influences might be heavily defined by culture agreements on what form looks good… what the materials are to be valued… what the color feels more attractive and meaningful, and how symbols can be reinforced with material goods. It is not just about personal tastes, but also the general trends, which may affect people’s response. In

\(^1\) David Carlson; Brent Richards, *DESIGN + CULTURE: A Return to Fundamentalism?*, David Report, Issue: 13,

specific, “the zeitgeist (or cultural preconceptions) contributes to how designs are interpreted and the extent to which they are accepted by society. This may influence the current product sign (the market’s conception of how a product should look) and the styles, which are acceptable.”

Fig. 2.1: Framework for consumer response to the visual domain in product design. (Crilly, Nathan; Moultrie, James; Clarkson, P. John, 2004)

2.1.2 Defining Culture

In the Chapter 1.2 I mentioned, “design creates value”. However, what factors that influence design, in order to make the differentiation? I believe that Culture plays an important role. Even though human beings have similar body structure, senses and

---

3 Crilly, Nathan; Moultrie, James; Clarkson, P. John, Seeing things: consumer response to the visual domain in product design, Design Studies, Vol. 25, Issue: 6, November, 2004. p. 547-577
emotions, such physiological and mental features, the way people interact with and perceive the same physical object are different. Existing researches show culture is one of the main factors that makes people around the world different. I divide those insights into two groups:

- **Occidental viewpoints** —

  In western, Hofstede\(^4\) claims that culture is “the collective programming of the mind which distinguishes the members of one group or category of people from another”. Psychologists Markus\(^5\) and Hamedani\(^6\) define culture as the patterns of representations, actions, and artifacts that are distributed or spread by social interaction. In a broad occidental point of view: culture describes a social phenomenon (**Independence**), which is caused by the mainstream value of a place in an era.

- **Oriental viewpoints** —

  From another standpoints in eastern, particularly in Chinese culture, which is influenced by Confucianism, we call *Culture* as “文化 (wén huà)”. “文 (wén)” means humanity as a noun, it also involves language and character. “化 (huà)” here represents “教化 (jiào huà)”, which is education as a noun, and educate as a verb, it also is the core value of this word (文化 (wén huà)). From a Taiwanese, who is affected by Confucianism point of view as well, I define

---

\(^4\) Gerard Hendrik (Geert) Hofstede (born 2 October 1928 in Haarlem) is a Dutch social psychologist, former IBM employee, and Professor Emeritus of Organizational Anthropology and International Management at Maastricht University in the Netherlands, well known for his pioneering research of cross-cultural groups and organizations.

\(^5\) Hazel Rose Markus is a prominent social psychologist and a pioneer in the field of cultural psychology.

\(^6\) Dr. MarYam Hamedani is Associate Director of the Center for Comparative Studies in Race and Ethnicity (CCSRE) at Stanford University.
culture as the deep enlightenment of humanities (Interdependence). It is the sharing results of human groups or societies; its sharing outcomes do not only include value, language and knowledge, but also include object matter.

**Independence** and **Interdependence** are the two types of social structure in western and eastern countries. A German social scientist, Ferdinand Tönnies\(^7\), made definitions for these two cultures by the names of *Gemeinschaft* (a community based on a shared sense of identity) and *Gesellschaft* (an institution intended to facilitate action to achieve instrumental goals). A *Gemeinschaft* describes the relationships in which members of the group are mutually dependent on the others. It based on the same goals that are going to achieve and the sense of unity. For example, relationships among family members, a network of friendships, and a fraternity, those are followed by a principle that a frequently face-to-face interaction, shared experiences, and even shared property in sometimes. A *Gesellschaft* is based on trading and contracts that have frequent interactions of exchanging goods and labor. Markets and Corporations are examples of *Gesellschaft*. Richard E. Nisbett, a social psychologist, adds that “The *Gemeinschaft* is often termed a “collectivist” social system and the *Gesellschaft* is often labeled an “individualist” social system.”\(^8\) But why do we have these two different social systems? And how do these two systems appear to the world? It started from ancient China and Greece. China consists of fertile plains, low mountains, and navigable rivers. Because of this geography and land features, ancient China favored agriculture and made centralized control of society relatively easy. Farmers needed to get along with each other, to live

---

\(^7\) Ferdinand Tönnies was a German sociologist and philosopher. He was a major contributor to sociological theory and field studies, best known for his distinction between two types of social groups, Gemeinschaft and Gesellschaft.

together in a harmonious society. Especially, for the rice farming that requests people to cultivate the land together. Old China was ruled by despots. Peasants had to get along with their neighbors and were ruled by village elders and a regional magistrate who was the representative of the king. Greece, on the other hand, consisting of mountains descending to the sea. Favored hunting, herding, fishing, and trade. Excepting trade, these economic activities do not require people to live together in the same community. Agriculture came to Greece later than China. It became commercial, instead of a living-request economic activity in ancient China. The soil and climate of Greece were appropriate to wine and olive oil production. Many farmers were more businessmen than peasants, and they were able to act on their own to a greater extent than were the Chinese. Therefore, it developed that the Greeks were in the habit of arguing with one another in the marketplace and debating each other in a group.

From these two ancient societies, we are aware that Greeks were in dependent and engaged in verbal contention and debate in an effort to discover what people took to be the truth. As Aristotle stated “The ultimate value of life is awaking with ability of thinking, rather than just survive.” Greeks thought of themselves as individuals with distinctive properties, as units separate from others within the society, and in control of their own destinies. On the other side of the Earth, Chinese social life was interdependent and it was not liberty but harmony humans with other humans. It was because of Confucianism that advocated “less with issues of control of others or the environment than with self-control, so as to minimize friction with others in the family and village and to make it easier to obey the requirements of the state, administered by magistrates.”
Due to those ancient social activities and philosophy principles, our modern life has evolved to two major different cultures with significant characteristics. Richard E. Nisbett distinguishes those traits as below:

- “Easterners attending more to environments and Westerners attending more to objects, and Easterners being more likely to detect relationships among events than Westerners.
- Easterners seeing substances where Westerners see objects.
- Westerners believing in controllability more than Easterners.
- Westerners seeing stability where Easterners see change.
- The patterns of explanation for events, with Westerners focusing on objects and Easterners casting a broader net to include the environment.
- Westerners preferring categories and Easterner being more likely to emphasize relationships.
- Westerners being more inclined to use logical rules to understand events than Easterners.
- Easterners being more inclined to seek the Middle Way when confronted with apparent contradiction and Westerners being more inclined to insist on the correctness of one belief vs. another.”\(^9\)

Through these understandings, thereby, we are able to know how people think differently, and have different interactions. After that, we can figure out a fundamental concept of how a valuable object/interaction would be made as: Humans establishes

Culture influences Design. Design creates value (tangible objects/intangible service) to the people. In the following chapter, I am going to describe how culture becomes a tool of perception.

2.1.3 Culture as A Tool of Perception

— Nisbett’s Schematic Model of Influences on Cognitive Processes:

We believe that there is a very different thinking system between Westerners (primarily Europeans, Americans, and citizens of the British Commonwealth) and East Asians (principally the people of China, Japan, Korea, and Taiwan). To explain the factors that cause the difference, Nisbett explored the origins of Western and Eastern thoughts, which are ancient Greece and China. This exploration provided a schematic model of influences on cognitive processes (Figure 2.2). The illustration on the left is the Greek style of thought; the illustration on the right is the Chinese style of thought. In Greek thought, the cognitive process is linear. However, the cognitive process in Chinese thought is described as one process containing the other.
Besides Nisbett’s model, there are many studies have been performed to explore the differences between western and eastern thought. Developmental psychologist Chiu\(^\text{11}\) did a survey with both American and Chinese children. By showing the children three objects, Chiu tried to figure out how children categorize objects. The results showed that American children tended to group objects by categories; on the other hand, Chinese children tend to group the objects by relationships. Another study, Ji, L.\(^\text{12}\) found the similar results in their research. They gave participants three words (e.g., panda, monkey, and banana), and were instructed to indicate the two words that were more closely related. The result showed that people from Mainland China and Taiwan based their

---


\(^{12}\) Ji, L., Zhang, Z., and Nisbett, R. E. *Culture, language and categorization*. Unpublished manuscript, Queens University, Kingston, Ontario. 2002
decision on the relationship between the words; the people from America based their
decision according to common category. Both of these studies show an essential
difference between eastern and western cultures; easterners consider relationships more
than objects.

Furthermore, Norenzayan, Smith, Kim, and Nisbett\textsuperscript{13} created other studies to
explore the idea further. The target object is shown to the participants. Then the
participants were asked to choose one of the groups, which they felt was more similar to
the target object. The results showed that East Asians were tending to gather the strong
similarity to the target. In contrast, Americans were focusing on the same rule-based
category.

In another model, — Luna and Gupta’s model, “The interaction of culture and consumer
behavior”\textsuperscript{14}: Cultural differences represent in various ways. Luna and Gupta describe the
manifestations of culture in four aspects: \textbf{Values, Heroes, Rituals, and Symbols}.

\begin{itemize}
  \item \textbf{Values}: The center of cultural manifestation. They are an inner aspect of human
  beings and are absorbed unconsciously from birth. Different cultures have
different values. For example, they have different concepts surrounding, evil
versus good, dirty versus clean, or dangerous versus safe, and so forth.
  \begin{itemize}
    \item \textbf{Heroes}: The people who display characteristics that are highly prized in a
culture are its heroes. Such as George Washington and YatSen Sun.
    \item \textbf{Rituals}: All of the collective activities found in a culture are rituals.
  \end{itemize}
  Rituals are socially essential. An example of a ritual is how individuals

\textsuperscript{13} Norenzayan, A., Smith, E. E., Kim, B. J., and Nisbett, R. E., Cultural preferences for formal versus intuitive
reasoning, Cognitive Science.

\textsuperscript{14} David Luna & Susan Forquer Gupta, An Integrative Framework for Cross-Cultural Consumer, International
Marketing Review, Vol. 18 No. 1, 2001, p. 45-69
within a culture greet each other.

- **Symbols**: Symbols are only recognized by the people within the same culture. A symbol can be a word, language, picture, or an object. For instance, eagle and English represent the United States, and plum blossom and Taiwanese as Taiwan.

![Diagram](image.png)

**Fig. 2.3**: The model of the interaction of culture and consumer behavior (Luna; Gupta, 2001)

Rituals, Heroes and Symbols are practices, which mean they are visible manifestations of culture. Practices change easily; however, values are very stable. The change of values is slow; therefore, cultural differences still exist among people from different societies.

Psychologists and marketing experts used different approaches and models to find the characteristics of different cultures. All of the results indicate that culture influences perception and makes people from different cultures have different ways of mental process. Since culture differences have a huge impact in our society and marketing.
Product design, as a problem-solving discipline, needs to consider having a model or framework, which allows designers to be able to design across different countries or regions. Hence, a transformational model (Figure 2.4) based on Luna and Gupta’s “Culture Value System (2001)” is proposed.

The Product Value System can be applied for domestic or international design projects. Especially for international design, this model will provide a direction for designers when they are dealing with an unfamiliar country project. The Product Value System has four sections: **Product Value, Affordance, Brand, and People Needs.**

- **Product Value**: The product value is created by designers’ culture influences. A designer helps a business success by providing valuable outcomes in order to solve the problems that people are facing. This also is the final goal of designing an object. For example, Apple designs the iPhone to better people’s communication and world connection. Tesla creates battery cars to save energy and reduce the global warming.

  - **Affordance (Symbol)**: There are five points that designers need to aware of:

  1. **Environment Context**: The scale, material, color, and form need to work harmoniously with the surrounding area.

  2. **Memory**: The form of the product needs to be familiar with, friendly, and to think about if the design has historical continuity of its culture or shape.

  3. **Operational**: The local control, display, external shape, material, and color. These meanings need to be clear, understandable, and
operable on a product design.

4. **Process**: The external shape design needs to contain cues of how the product works.

5. **Ritual of use**: The product design needs to comprise the implications of culture connection and meaningful expression.
   - **Brand (Hero)**: Design and business are in coexistence. Designer, either works for an enterprise or a consultancy, should always follow the brand or client’s identity to display the characteristics of its soul, in order to make the differentiation from other brands in the marketplace. For instance, the best product design is that the brand still be easily recognized without its logo.
   - **People needs (Ritual)**: In the model of the interaction of culture and consumer behavior, rituals involve the consumption goods and services. Therefore, designers need to be aware of human behavior, social activities, and environmental issues of the target region. It will help a designer better understand the current situation, and find out the pain point. After that, valuable outcomes will be made and be able to fit the people needs.
The conversion from Culture Value System to The Product Value System for Unfamiliar Cultures.

The practical project of the Product Value System will be presented in Chapter 3.

2.2 The Chinese Culture

This section includes religion, philosophy, and the Chinese cultural value.

2.2.1 Religion and Philosophy of Chinese culture

The most influential philosophy in Asia is Taoism, and it is the main philosophy that affects Chinese culture. The principle of Taoism is to make human and nature become a whole. The emphasis on unity and harmony is influential in Chinese culture. There are five elements to constitute nature in Chinese culture: fire, metal, wood, water, and earth. *Tai-Ji* (Figure 2.5), the symbol of Taoism, is a combination of *Yin-Yan*. Yin (the black semi-sphere, means negative) -Yan (the white semi-sphere, means positive) is the conception of ancient Chinese people. It represents sky and earth, sun and moon, day and night, summer and winter, male, and female, up and down, destructiveness and
containment, etc. The combination of Yin-Yan represents the harmony of the Chinese cosmology.

According to the *I-Ching* (Yi-Jin), it mentions, “Tai-ji (the Supreme Ultimate) generates *Yin-Yan* (the two primary forces), *Yin-Yan* generates the *Sixiang* (Figure 2.6, four symbols, the Azure Dragon of the East, the Vermilion Bird of the South, the White Tiger of the West, and the Black Turtle of the North), The *Sixiang* generates the *Ba-Gua* (Figure 2.7 and 2.8), The *Ba-Gua* determines good fortune and misfortune, Good fortune and misfortune create the great field of action.” *Ba-Gua* has eight trigrams to represent the fundamental principles of reality, seen as a range of eight interrelated concepts. *Ba-Gua* is usually applied to *Feng-Shui*, a Chinese philosophical system of harmonizing everyone with the surrounding environment, and religious practice in Taoism.

![Yin-Yang symbol](image)

*Fig. 2.5: Tai-Ji, the combination of Yin and Yan*
Fig. 2.6: Tai-Ji with Sixiang

Fig. 2.7: Ba-Gua, the eight trigrams

Fig. 2.8: Ba-Gua with Sixiang and Tai-Ji
2.2.2 Chinese Culture Value

Chinese culture is rooted in the society for over five thousand years, and even affects people in different regions, including Mainland China, Hong Kong, Taiwan, and the Chinese people overseas. The five orientations of Chinese culture value was depicted by Yau\textsuperscript{15}:

1. **Man-to-nature orientation:** Affected by Taoism, harmony with nature is the key aspect of this orientation. Another aspect of man-to-nature orientation is Yuan. Yau described Yuan as “predetermined relations with other things or individuals, which are far beyond one’s control…” (Yau, 1994, p.69). Chinese people believe that a powerful external force governs the interrelationship with universe.

2. **Man-to-himself orientation:** Abasement and situation-orientation are two aspects of man-to-himself orientation. Modesty and self-effacement are two important virtues in Chinese culture.

3. **Relationship orientation:** There are four aspects: respect for authority, interdependence (doing favors), face (a reputation achieved through getting on in life, through success or ostentation), and group-orientation. Because of Confucianism’s influence, Chinese people respect authority strongly.

4. **Time orientation:** Chinese has great respect for the past. The family tradition and the worship of ancestors describe clearly of past-time orientation. Except past-time orientation, Chinese also regard the community as an important factor of life. Once the relationship is established, it will be for a long time.

**Personal-activity orientation:** It is the concept of moral self-control. Strongly

\textsuperscript{15} Yau, Oliver H. M, Consumer behavior in China: customer satisfaction and cultural values, Routledge, New York and London, 1994
influenced by Confucianism, Chinese people are taught to avoid complete repression or unrestricted satisfaction of primitive passion and impulses. (Yau, 1994)
CHAPTER 3  A Practical Project by Using The Product Value System

In this chapter, I applied each aspect of Product Value System for designing a portable coffee maker for American market. The product testing and result will be shown in CHAPTER 4.

3.1 The Product Value System: People Needs (Rituals)

According to “The 2013 State of the Vending Industry report”¹⁶ (Figure 3.1), OCS (Office Coffee Service) operators experienced sales growth, especially in the fresh-brew specialty/flavored segment. In 2013, fresh-brew regular coffee even accounted for $334.71 million in the coffee service industry.

Moreover, In “2014 National Coffee Drinking Trends\(^7\) (Figure 3.2 and 3.3)”, National Coffee Association (NCA) reported that daily consumption of gourmet coffee beverages is up 3 percent to 34 percent from 2013’s 31 percent. And now, consumers are looking for even more convenience. The same NCA report found that 15 percent of Americans have a single-cup brewer in their household and another 25 said they were very likely to get one in the next six months.

The way in which consumers are brewing their coffee is changing and the location in which they brew their coffee can be changed as well. In other words, all the signs point out that American needs a new generation of coffee maker, which is “Convenience”, “Portability”, and “Frugality”.

Fig. 3.4: 2014 National Coffee Drinking Trends -2
3.2 The Product Value System: Affordance (Symbol)

By understanding the environment context, I analyzed form, color, and material from Top 100 travel mugs on Amazon.com.

3.2.1 Color analysis

![Color Analysis Diagram](image)

There are many travel mugs in the market currently. In this color wheel, I can see that red is the most popular color for sale in the American market, which is likely a strong preference of color that Americans would select for a travel mug.
3.2.2 Form analysis

The form analysis is divided in four segments: unaggressive and aggressive forms, which is based on how complex the form is constructed; organic and geometric forms, that is based on how smooth the surface of form is. The result shows that the most common form aesthetic of a travel mug in American market is the combination of organic with unaggressive form, which affords an easy and comfortable way for people to carry around.
3.2.3 Material analysis

The Top 100 travel mugs are made by four materials: plastic, metal, ceramic, and wood. Plastic and metal are the most frequent materials that show up in the American market. It indicates that American prefers having a durable and long-lasting product.

To sum up the affordance aspect, the design direction for a portable coffee maker will be: **red color on an unaggressive and organic form with plastic and metal materials.**
3.3 **The Product Value System: Brand (Hero)**

Since the portable coffee maker is a kitchen appliance, I decided to use KitchenAid\(^\text{18}\) as my target brand, and do an analysis of its color, form, and material.

### 3.3.1 **KitchenAid Brand Analysis: Color**

[Fig. 3.8: KitchenAid Analysis: Color](#)

KitchenAid uses different colors on their various product lines. However, since red is their brand identity color, KitchenAid uses red color on every product.

### 3.3.2 **KitchenAid Brand Analysis: Form**

\(^\text{18}\) KitchenAid is an American home appliance brand owned by Whirlpool Corporation. The company was started in 1919 by TheHobart Corporation to produce stand mixers; the "H-5" was the first model introduced.
This diagram represents that the form language of KitchenAid is the combination of unaggressive with organic, which provides neat, simple, and straightforward identities of KitchenAid.
3.3.3 KitchenAid Brand Analysis: Material

Most of the KitchenAid small appliances are made by more plastic and with less metal. It stands the brand identity out as “high performance and craftsmanship, attention to detail, and timeless design”\(^\text{19}\).

To sum up the color, form, and material analysis, KitchAid brand identity is red color on friendly organic form with more plastic and less metal material.

\(^{19}\) About KitchenAid, http://www.kitchenaid.com/about-kitchenaid/
Conclusion

According to the Product Value System, the product value is created by: People Deeds, Affordance, and Brand. Therefore, the People Needs will be: **Convenience**, **Portability**, and **Frugality**. The Affordance will be: **red color, which affords patriotism for the most of countries, especially in the United States, on unaggressive organic form that affords a easy and comfortable way to carry around, with plastic and metal materials that are able to afford durable and long-lasting feeling of a product.** The Brand Identity will be: **high performance and craftsmanship, attention to detail, and timeless design.** Hence, the design direction of the portable coffee maker will be: **a device, which is designed by red color on unaggressive organic form with more plastic and less metal materials. And it will provide convenience, portability, and frugality for people, who love to drink coffee.**
3.4 The Portable Coffee Maker Design Process

In this section, I am showing the entire design process of designing a portable coffee maker.

3.4.1 The Portable Coffee Maker Design Process: Concept Development

Fig. 3.11: Concept Development - 1
3.4.2 The Portable Coffee Maker Design Process: Prototype Making

![Fig. 3.12: Concept Development - 2](image)

![Fig. 3.13: Prototype Making – 1](image)
Fig. 3.14: Prototype Making – 2

Fig. 3.15: Prototype Making – Four Prototypes

Fig. 3.16: Prototype Making – Final Decision
3.4.3 The Portable Coffee Maker Design Process: 3D Modeling

Fig. 3.17: 3D Modeling – External Model

Fig. 3.18: 3D Modeling – Internal Model
3.4.4 The Portable Coffee Maker Design Process: 3D Rendering

Fig. 3.19: 3D Rendering – External Model

Fig. 3.20: 3D Rendering – External Model with Internal Model
3.4.5 The Portable Coffee Maker Design Process: Physical Model Making

Fig. 3.21: Physical Model Making – Sanding Powder Printed Models

Fig. 3.22: Physical Model Making – Painting

Fig. 3.23: Physical Model Making – Final External and Internal (with K-Cup) Models
3.4.6 The Portable Coffee Maker Design Process: How It Works

Fig. 3.24: How It Works - 1

1. Step 1: Twist the top and remove it.
2. Step 2: Take off the K-Cup cap.
3. Step 3: Pour the water in about 10 to 12 oz.
4. Step 4: Pick a coffee K-Cup, and place it on K-Cup tray.
5. Step 5: Place the K-Cup cap back.

Fig. 3.24: How It Works - 2

7. Step 7: Press the HEAT button. Once you press it, the edge of the button and the icon will light up red color.
8. Step 8: Brewing coffee — Since the air pressure difference, hot water goes up to squeeze the coffee out of the K-Cup, and cold water goes down. Keep the circulation for 7 mins, the light will turn off, and your coffee is DONE.
9. Step 9: Press the top to drink your coffee. You are able to drink in any direction.
10. Step 10: Press the top again to stop.
11. Once you used the Portable Coffee Maker for a period, the edge of the button and the icon will flash red color, that means the battery is almost running out of power.
12. Place the Portable Coffee Maker on the charging dock. When you see the edge of the button and the icon turn GREEN, you are ready to GO.
Chapter 4: Testing and Result

I interviewed 30 design background Americans and 30 non-design background Americans by using Product Testing Questionnaire (Fig. 4.1). I said that I am designing a portable coffee maker for American market, and I would like to save the cost and time for people who love to drink coffee. After that, I showed the testers my physical models, and asked: Could you please tell me that what kind of reaction you have when you see these two objects (the portable coffee maker and its charging dock)? I would like to see whether the form, color, material, and function are understandable for them before my explanation. After they told me what they think about my design, I demonstrated the using process of the portable coffee maker in front of the interviewees, and asked them to finish the questionnaire. The results are presented below. I use Likert Scale for Q1 to Q3 and Q6, and Quantitative Statistics for Q4, Q5, and Q7.
Product Testing Questionnaire

☐ FEMALE ☐ MALE Major: ________________ Age (optional): ______

1. I like this design.
   Strongly disagree Disagree Normal Agree Strongly agree
   ○ 1 ○ 2 ○ 3 ○ 4 ○ 5

2. It looks easy to use.
   Strongly disagree Disagree Normal Agree Strongly agree
   ○ 1 ○ 2 ○ 3 ○ 4 ○ 5

3. This product fits in my daily life.
   Strongly disagree Disagree Normal Agree Strongly agree
   ○ 1 ○ 2 ○ 3 ○ 4 ○ 5

4. Which culture this product looks like?
   German American Swedish Chinese
   ○ ○ ○ ○

5. Which brand this product looks like?
   KitchenAid Electrolux Braun Franz
   ○ ○ ○ ○

6. This product will cut into American market.
   Strongly disagree Disagree Normal Agree Strongly agree
   ○ 1 ○ 2 ○ 3 ○ 4 ○ 5

7. Do you want to buy it?
   YES NO
   ○ ○

8. If NO, why?

9. Any suggestion or improvement of this product?

Fig. 4.1: Product Testing Questionnaire
4.1 Q1: I Like This Design.

The scores of both groups are close to Strongly Agree, which means both groups do like the concept and design of the Portable Coffee Maker. There are two people in
None-Design Background dislike the design, because of the red color. That is their personal preference.

4.2 Q2: It looks easy to use.

<table>
<thead>
<tr>
<th>Design Background (30)</th>
<th>None-Design Background (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong disagree (-2)</td>
<td>Strong disagree (-2)</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>28</td>
<td>36</td>
</tr>
</tbody>
</table>

1.37

Chart 4.3: Product Testing Questionnaire, Q2-1

<table>
<thead>
<tr>
<th>UNITS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
</tr>
<tr>
<td>Normal</td>
<td>4</td>
</tr>
<tr>
<td>Agree</td>
<td>25</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>22</td>
</tr>
</tbody>
</table>

Column Chart

32
23
4

Pie Chart

- Strongly Agree: 53%
- Agree: 36%
- Normal: 7%
- Disagree: 2%
- Strongly Disagree: 2%

Before and after my description of the Portable Coffee Maker, both groups do think the form, color, material, and function are understandable. There is one female in
None-Design Background selects Disagree, because she thinks the using process is quite complicated.

4.3 Q3: This product fits in my daily life.

<table>
<thead>
<tr>
<th>Design Background (30)</th>
<th>None-Design Background (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong disagree (-4)</td>
<td>Strong disagree (-4)</td>
</tr>
<tr>
<td>Disagree (-3)</td>
<td>Disagree (-3)</td>
</tr>
<tr>
<td>Normal (0)</td>
<td>Normal (0)</td>
</tr>
<tr>
<td>Agree (+1)</td>
<td>Agree (+1)</td>
</tr>
<tr>
<td>Strong agree (+2)</td>
<td>Strong agree (+2)</td>
</tr>
<tr>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>-4</td>
<td>-4</td>
</tr>
<tr>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>-2</td>
<td>-2</td>
</tr>
<tr>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

0.90

Chart 4.5: Product Testing Questionnaire, Q3-1

In this test, my assumption of “This product fits in my daily life” is closely correct.

The results of Design-Background and None-Design Background are close to “Agree”
and a little bit more than “Agree”. Some testers do not drink coffee or do not drink coffee often, so they select “Strong Disagree” or “Disagree”.

4.4 Q4: Which culture this product looks like?

Chart 4.7: Product Testing Questionnaire, Q4 – Design Background

<table>
<thead>
<tr>
<th>CULTURE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>German</td>
<td>6</td>
</tr>
<tr>
<td>American</td>
<td>13</td>
</tr>
<tr>
<td>Swedish</td>
<td>6</td>
</tr>
<tr>
<td>Chinese</td>
<td>0</td>
</tr>
</tbody>
</table>

Chart 4.8: Product Testing Questionnaire, Q4 – None-Design Background

<table>
<thead>
<tr>
<th>CULTURE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>German</td>
<td>5</td>
</tr>
<tr>
<td>American</td>
<td>13</td>
</tr>
<tr>
<td>Swedish</td>
<td>9</td>
</tr>
<tr>
<td>Chinese</td>
<td>4</td>
</tr>
</tbody>
</table>

For people who pick American culture, they mention that because of the red color and streamline form that recall them the Coca Cola glass bottle. And a man told me that:
“Time is money, we prefer something that is efficiency, simple and easy to use. And we did like complicated products before, but now is changing. Keep it simple.” For people who select European countries (Swedish and German), they think the shape is clean and neat, and the function is straightforward and thoughtful. Some of them feel this product could be found in IKEA’s product line. And there are 10 people told me this product is based on Chinese culture, because of the red color, which reminds them Chinese flag, and the form of the product looks like Chinese vase.

4.5 Q5: Which brand this product looks like?

Chart 4.9: Product Testing Questionnaire, Q5 – Design Background
Chart 4.10: Product Testing Questionnaire, Q5 – None-Design Background

In this case, I see the big difference between Design Background and None-Design Background. The people who have design background indicated that this product has strong KitchenAid features: red color, big radius, bulky shape, streaming curves, and has more plastic parts than metal. These points force them select KitchenAid as the product’s brand. 17 people pick Braun for its simplism form; 4 people choose Electrolux for its highly contrast material; and 1 female selects Franz, because she has no idea, so she selects one randomly.
Q6: This product will cut into American market.

Most of the interviewees state that the Portable Coffee Maker is a great product for the most Americans since drinking coffee is a part of American culture, and it is really convenient to save time and money while on the way to the destination. However,
there 3 people disagree with it; they claim that the inside of the product might not easy to clean, it will be a big issue for them.

4.7 Q7: Do you want to buy it?

Design background (30)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>9</td>
</tr>
</tbody>
</table>

Non-Design background (30)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>3</td>
</tr>
</tbody>
</table>
There are 46 people want to buy this concept and design. They are my target user, and the Portable Coffee Maker truly saves their time and expense while they are moving around. They look forward to me making it happen.

4.8 Q8: If NO, why?

On the contrary, there are 12 people stay in line or will not buy it. They would like to the price first, and then make the decision. One female states that K-Cup is not environmental friendly; she prefers to grind coffee beans by herself. Other negatives, because of they do not drink coffee.

4.9 Q9: Any suggestion or improvement of this product?

People love the concept a lot; however, there are some minor issues need to be considered. 1) Think about ECO friendly, using K-Cup will produce more trash. 2) Add a handle to enhance the mobility. 3) Relocate the heat button in order to have a more comfortable using behavior. 4) Have more color choices, and other material combinations. 5) Put texture on the surface for easier holding.
CHAPTER 5: CONCLUSION

All in all, the tested project and the survey went very well. I got the answers I wanted, and the Product Value System absolutely helped me a lot to do an unfamiliar cultural design. The Product Value System has the ability to help an industrial designer by providing a right design direction. Nevertheless, there are some limitations that affected the testing results:

1. Region: Since the cost and time issues, I only tested Cincinnati, OH residents.

2. Number of People: There were 60 American (30 design background Americans, 30 none-design background Americans) did my survey. In order to get more precise outcomes without time limitation, I would like to interview 200 Americans (100 design background Americans, and 100 none-design background Americans).

3. Age: The unit separation of each age group is not equal. I spent lots of time staying at school; hence, there are 60% of interviews are in the group of 18~26 ages. (Chart 5.1 to 5.3)
**Design background (30)**

<table>
<thead>
<tr>
<th>AGE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–26</td>
<td>21</td>
</tr>
<tr>
<td>27–35</td>
<td>4</td>
</tr>
<tr>
<td>36–44</td>
<td>2</td>
</tr>
<tr>
<td>45–53</td>
<td>1</td>
</tr>
<tr>
<td>54+</td>
<td>0</td>
</tr>
</tbody>
</table>

**Non-Design background (30)**

<table>
<thead>
<tr>
<th>AGE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–26</td>
<td>15</td>
</tr>
<tr>
<td>27–35</td>
<td>4</td>
</tr>
<tr>
<td>36–44</td>
<td>3</td>
</tr>
<tr>
<td>45–53</td>
<td>3</td>
</tr>
<tr>
<td>54+</td>
<td>1</td>
</tr>
</tbody>
</table>

---

**Chart 5.1: Interview Age Groups – Design Background**

**Chart 5.2: Interview Age Groups – None-Design Background**
4. Mock-up: I only provided one color on one exterior model and one interior model. Testing the project with a variety of colors on working mock-ups will have more accuracy feedbacks.

5. Questionnaire: Q6, “This product will cut into American market.”, is one of the important questions I would like to ask. However, there were some people who cannot get what “cut into American market” means. If I rephrase the question to “This product concept will succeed in the American market.”, the answer would be different.

6. Personal experience: Since I have been living in the United States for 3 years, I am not the ideal designer to take on this project. If there were no time limitation, I would take design studio students and divide them into two groups; one group to use The Product Value System to design an object an unfamiliar culture, another group to use their own design strategy. In the end, I will analyze student outcomes.
7. The Product Value System is not limited to design for small appliances, but also for other product categories, such as consumer electronics, furniture, and power tools.

During the in person interview, there were several people asked that: “Do you have a specific market or user?” Since most of American loves to drink coffee, I should have defined a target market or user; such as, this portable coffee maker is designed for industrial designers, or businessmen, or college students. Different groups will have different usage pattern, and it would cause the design direction. Therefore, I assume that a market or user could be a part of the Product Value System. And this aspect will be my further research.
1. Alberto Villarreal, *Products, new meaning, it is personal, Innovation*, IDSA, spring 2005, p. 27


    *Unpublished manuscript*, Queens University, Kingston, Ontario. 2002


