UNIVERSITY OF CINCINNATI

Date: May 19, 2009

I, Nickolas Popoutsis, hereby submit this original work as part of the requirements for the degree of:
Master of Architecture

in The College of Design Art Architecture and Planning

It is entitled:
Amenable Building: Designing for Change In The Musical Process

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Amenable Building: 
Designing for Change in the Musical Process

Date - 2009. 05. 26
A Thesis Submitted to - The Graduate School of the University of Cincinnati
In Fulfillment of the Degree of - Master of Architecture
In the Department of - Architecture of The College of Design Art Architecture and Planning.

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Bachelor of Science in Architecture at The University of Wisconsin - Milwaukee, Wisconsin, May 2006

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Abstract

The purpose of this thesis is to expand the scale in which designers think about buildings to include longer time effects. Through studying a user process, particularly musicians, scripts and trends can be documented to help guide and organize the buildings function over time. Within these scripts it is important to understand that some spaces will perform better when the specifications of the space are narrowed, while others will perform better if the specifications are more open-ended, allowing for the “unscripted” event to occur. Because the specificity of program will greatly vary, it is important for the unplanned spaces to be considered just as pertinent as the specific spaces. For the building to respond to this fluid transfer of functions it should not be thought of as complete; but rather, an object that takes on a life of its own through its synergetic relationship of internal and external forces. The goal is to coalesce designer intent with user interaction to ultimately create a space that is self evolving and responsive.
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When looking at architecture in today's digital age of endless possibilities it is important to question one's use of technology and information. What is the architect's responsibility? Is it merely to produce interesting and compelling form? Design for the most economical cost? Create the most functional space? Or, is it to design using the most sustainable methods? Perhaps it should be a combination of all of these ideas. Regardless of the driving forces in design it is important that design be mindful of its past, present, and future states. Since society has typically had the attitude that a building must remain permanent, the building is required to resist the changing forces around it. From this, conditions are created where buildings become obsolete, abandoned, demolished, or preserved as ways to deal with inflexibility. It is evident that the philosophy of the last century won’t suffice, and buildings cannot be expected to perform in the same manner as they did when originally designed. It is now important to question the way architecture, building, and design can embrace the qualities of change, and respond to the duration of time.

In order to study the types of changes that can occur within a space, this thesis will focus on the issue of flexibility and evolution within the realm of the musical process. The concept of a musical process works well because of its long history and relation to different scales and rate of change. No two decades of music sound identical due to new technology, trends, styles, techniques, and artists that are constantly recreating themselves. By designing for artists and music in the present state, considering trends of the past, and establishing some techniques and strategies for the future, the design can become an integral piece and follow music’s evolutionary path.
IT IS ONLY HUMAN TO BE FLEXIBLE

If one looks at the history of mankind, humans have typically been a nomadic group living active lifestyles that change depending on weather, seasons, migration patterns and availability of goods. Modern culture still requires people to move and adapt to different settings where they can engage, interact, and shape the environment around them, particularly musicians. In a creative art, such as music making, artists are constantly forging and rethinking the way space is organized and used to accommodate acoustical requirements, band dynamics, or over all ‘feel’ towards a space to capture a certain mood or sound.

Everyone in their own right is a designer of some type. People constantly dictate the way they live and work, and imprint their personality into the space they inhabit whether they intend to or not. These imprints can be as simple as moving furniture, hanging artwork, and painting surfaces; or can become as involved as renovating, adding or creating spaces. Regardless of the type of change made to the space, the uses have ultimate control over their environment and will continue to shape it even if the space is intended to accept change or not.

What if buildings were designed in such a way that they could easily adapt to the needs of these changing parameters? Buildings could begin to follow an evolutionary process; something that is never complete but rather built upon. Instead of limiting the users to the confines of a static space, the building can become an interactive environment; one that liberates artists and dwellers to rethink the potential of the space around them.
PART OF A SYSTEM

Since people, trends, and culture are never fully predictable it is important to think of systems as being flexible. When thinking of a city as a system, buildings tend to be one of the least flexible components. Deleuze and Guattari refer to this system as the “milieu” or environment. The concept of an environment can always be broken down in scale and thought of in a different context. Therefore, environments can exist within environments allowing each to be diagrammed separately with independent issues. Since these topics of the milieu are formed by outside forces and not necessarily physical conditions, the construction of the milieu form is created by the relationship of the “product of networks and flows.”

People come and go, fashion trends and styles cycle through, products and technology are changing, building uses are altered, homes and businesses open and close, yet a typical reaction to these responses is to demolish, renovate or just cope with the given conditions. To design a successful building it is necessary to understand its interconnected nature. Ballantyne states, “A successful building – a building that sustains life, and becomes a thriving organism. The factors that make people, or buildings or towns live and work and thrive are formless and need to be understood.”
It is important that building designs be sensitive to their environment, both internal and external and it is necessary for them to respond to their conditions which are in constant flux.

The building process and construction of buildings are often dictated by speed of delivery and reliability rather than experimentation. This creates a formulaic design principal that results in similar types of buildings.

Instead, designers must reinvent their thought in order to produce something new. When looking at buildings within the context of the milieu it is evident how ideas, materials and politics shape buildings, and how they in turn shape us. Because of these various forces, as Ballantyne states, it is important that “one opens up to chaos, makes oneself receptive to what one finds there, steps outside the structured world of habits and common sense, and sees what happens.” It is important as a designer to embrace this quality in design and revisit preconceived thoughts to find something new.

By understanding how individuals, society, infrastructure, income, and numerous other abstract factors can influence the form of a town, building or space, one can better understand how to design for their needs. Because these various factors never remain constant it is important that buildings along with people and development remain flexible to accommodate for change over time. This allows the components that make up the milieu to easily adapt to the environment.
CONSIDERATION OF TIME

In the book “The Clock of the Long Now” Stewart Brand discusses issues of time and responsibility across mediums of humanity. He argues that it is our responsibility to understand the past and be mindful of the future in order to plan for a good present. By analyzing time over differing durations, designers and planners can more aptly accommodate for change and suitability in multiple situations.

Brand coined the term ‘Long Now’ as an idea based on a concept created by pop music artist, Brian Eno. Eno describes how people can have different definitions of time and place. For example, “here” might be considered, to some, as only occupying this room, while to others it may mean the building, neighborhood, or the city. Brand applied this same attitude toward considerations of time. When someone says “now” they could mean this second, this day, week, or year etc. If this attitude is applied to architecture and design, it can help us to think about a building over a greater scale to address issues that may arise in the future both near and far. It frees us from designing only for immediate needs and helps to invest and consider what is also important for the future.

The concept of “now” is no longer the present, but a combination of the past and the future, each dealing with various degrees of change in between. If ‘now’ were to be considered in terms of a 100-year span, one could consider fast paced, day to day changes, such as fashion trends and immediate desires, while also accounting for long term plans such as families, careers, and future generations. There are examples throughout history where sudden changes in long-term effects can cause major disruptions in the cycle of society, culture or even government.

Implications of the various units of time created within different categories, species, or classifications of mankind (such as the individual, families, or civilizations etc.). Scientists have studied various species and looked at their ability to respond to shock, which in this context refers to any type of abrupt change. Two basic components can be used to describe reactions to shock, or change within a system: the ‘Fast” and the “Slow”. This combination promotes an evolutionary progression by allowing some components to respond to shock (Fast) and others by resisting and maintaining its steady course over time (Slow). This system allows different components to adapt and conform to various types of change over multiple scales of time.

The balance between Fast and Slow is critical to an evolutionary process. The combination of both responses helps a society to become successful and capable of growth and learning. It allows the Fast to take...
ranging from fastest changing to slowest. The equilibrium created by the different levels allows society to adapt to “Shock” while also maintaining its slow steady pace which refers back to the concept of Fast and Slow.

Topics relating to change, adaptation, and frequency of cycles, all have a major impact in the design considerations of a flexible or adaptable building. It is important to understand that this concept of variable time scales can allow buildings to learn. In order to accept change, one needs to consider the ‘Fast’ and ‘Slow’ changes to allow for various degrees of shock or influence to the system. When considering these types of trends in different fields of study, the same basic structure can be applied to the evolution of music as demonstrated in Image 6b. The over all music culture its continuing its slow progression with the evolution of mankind, while individual songs and albums are often jumping around and sporadic.

As buildings are an integral part of the system that we live in, architects have a responsibility to these inevitable changes. They must be able to design for the change that we live in and understand the responsibility buildings have to perform throughout their lifespan. By understanding that not all building components will need to change at the same rate or scale, the argument can be made that building requirements go beyond just spatial design requirements; consideration of time is now forethought, not hindsight.
This project is meant to work as a method for implementing performance in architecture. Buildings are no longer meant to be just shelters, but rather tools for executing their designed function. For example, a house is a tool for living, an office should be a tool for working, and each of those should provide the necessary means to do so. Spaces should support the needs of the users and promote the alteration of the space as a response to change and time. This allows for open-ended events to occur that could not be foreseen in the original design process. Because uses and methods can change, the architecture within a space should be something that people look to as liberating rather than limiting. The way a space is perceived should promote change and alteration allowing users and designers to challenge and rethink the way materials and space can and should perform. With this attitude of a performance-based design in architecture, flexibility is a vehicle in which performance can be stretched over time, therefore allowing a building to maintain its functionality by learning and adapting over time.

The notion of performance-based design is a concept that is based off the reading *Unscripted Performance* by David Leatherbarrow. Leatherbarrow takes the approach that architecture should be conceived of from a ‘performance’ standpoint as opposed to the standard aesthetic and physical bias typically emphasized in architecture. The way architecture has been created throughout history should be questioned. Investigations of how a building’s function and use can change throughout time might serve as new way for understanding architecture.\(^8\)

The fact that architecture is typically a static object within a dynamic environment can often inhibit it from performing at a high level.
because of unpredictable factors. Leatherbarrow compares architecture to other genres of the fine arts such as music, dance and film. He argues that art is meant to be an experience understood through time rather than at an inert instance to simply be admired; therefore architecture should be experienced in the same manner. Through these experiences people encounter events that are unexpected and give the building its life and meaning, making it necessary for the building to adapt to unscripted performances.

Designers should think about building performance in a way that embraces the method in which the building acts rather than what the building actually is. By designing for unscripted conditions the building can become flexible and adaptable, allowing it to be a tool for one to use, dwell, and occupy to take on a life of its own. This prevents buildings from becoming merely a static piece of art frozen in time only to be preserved. The fact that architecture has a responsibility to perform should be in the forefront of the criteria for which buildings are designed.

Images 8 a,b,c,d
Humans will always use their environment in creative and unexpected ways. Architects should embrace these qualities that come about through the implementation of their design in order to take advantage of what users can bring to the design. The element of mastery and creative influence about how space can, and should, be used will certainly add a level of richness to any design. As shown in image 8a the Van Nelle sugar tea, and tobacco factory in Rotterdam designed by Johannes Brinkman was transformed into a multidisciplinary complex to house design firms. This lead to the creation of a new and exciting use of the space. Another example of unexpected use was on the 50th anniversary of the Golden Gate Bridge (11c) in which it experienced its heaviest load with out having a single car on the bridge.
EFFICIENCY

Flexibility in buildings can also offer a building more efficiency in its space, operation, and material use. There are often rooms or components of buildings, which have little, or infrequent use only to end up being wasted space until that one specific use is needed. For example, a conference room in an office building that is only used for large meetings. This is the type of space where its function is only met when a meeting is in session; the rest of the time it lies dormant. If this space is only used less than 50 percent of the time, why not conceive of that space in a temporary manner? If the same space can transform between two different uses, for example a meeting room and a workspace, less materials will be required and unused space won’t have to be conditioned, resulting in a more efficient use per area.

When looking at efficiency within buildings, it is also important to understand the advantages that flexibility offers in situations of deficiency. Some instances require a designer to address heavy constraints such as limited physical space or tight financial means in which case flexibility can be implemented in the design to provide more within the same confines. This is something that has been found in regions that are challenged with situations of high density such as, the Netherlands, China, and Japan. In many projects that have major constraints, creative solutions and multipurpose layouts have often been the response to maximize functionality and use.

One of the more germane practitioners to this topic is architect, Gary Chang of EDGE design in Hong Kong. Throughout his continuing architectural discourse, many of his projects and studies revolve around the theme of overlapping functions within the same space that provide easy transformation between multiple operations. Among the variety of projects he has completed, his own private residence is perhaps the most interesting to study. His tiny 344 square foot loft apartment (Image 9) is one that he lived in as a young teenager and was so confined that he had to sleep on a fold-out couch in the hallway. He later purchased the space to use it as an experiment to understand how to maximize space. Through the use of shifting wall units suspended from tracks in the ceiling, and an ‘accordion’ type strategy for the walls, the space can be easily transformed. Throughout his study of the apartment, he has renovated the space four times. Through learning and time he has been able to transform the space into 24 multiple configurations including a kitchen, library, laundry, dressing, lounge, wet bar and dining spaces just to name a few. Through embracing these constraints Gary Chang was able to implement strategies for overlapping program efficiently into one limited size space.
FLEXIBILITY IN THE MUSIC PROCESS

To test the idea of flexibility in architecture, an appropriate vehicle for investigation must be selected. By designing for a building that facilitates a process, one can start to look at how a building might need to change throughout time to accommodate the different phases of that process; whether that be selling a product or creating an art piece. Although almost all fields of study provide some type of process, the creative cycle that a musician goes through provides a clear three-cycle example of how functions and activities vary and will serve as the basis in which this thesis will be explored.

The typical recording artist goes through three major phrases to craft their piece: writing, recording, and performing. Writing is the origin of the project. It is the time when an artist conceptualizes a plan to create a piece. In this phase, chance and serendipity are welcome and essential to foster new and creative ideas. The next phase is the ‘working’ or ‘recording’ phase which takes the material produced in the writing phase and expands upon it and records it. This typically is more structured, but some artists choose to allow the act of work to influence the final product, in which case, some significant changes and experimentation can occur within the recording environment. The final phase is the performance. This is the chance for artists to showcase their work and engage the public.

By studying the multiphase process, the thesis will explore how the three different phases can be combined into one space. In doing this, artists will have the freedom to dictate their own creative path giving them the ability to forge their own environment. This allows artists to easily switch between phases of work, or even reshape the type of writing, recording, or performing space they are occupying. As Stewart Brand states, ‘Function reforms form, perpetually,’ making the building an interactive tool. This thesis will identify types of spaces that are highly defined and slower changing while also accounting for less defined spaces that transform through the habits of the artist.

Music is an art form that has always been capable of spanning cultures, social groups, and most importantly, time. It is something that is continually in flux and constantly being built upon or reinvented by professionals, amateurs, cultures and the general public. In today’s music scene, there are hundreds of genres and subcategories of music which have a long history and lineage which create a musical group’s origins and apparent ‘unique sound.’ In reality, this unique sound is typically a reinvention, collaboration, or fusion of previous styles that is used to create something new. Many of the most innovative bands throughout time have paved the way for new creative frontiers by using this collaborative and
FLEXIBILITY IN THE MUSIC PROCESS

cross-pollinizational methods such as the Beatle's collaboration with Ravi Shankar, or David Byrne’s experimentation with African, Latin, and other world music. Through the design of a recording studio that considers a variety of musical types a new type of music studio can provide a home for artists in each phase of their work. This will allow them to collaborate and share ideas about different musical theory, style, and technique to fuel creativity within a unified music think tank.

Musicians are highly creative people and continually strive to push the boundaries of music. Many new musical sounds and strategies stem from experimentation and chance within the studio setting. Bands such as Pink Floyd and the Beatles are examples of groups that constantly tried to push these boundaries. Around 1965 with the Rubber Soul sessions, the Beatles began to think of studio as a tool, not a space allowing it to become another instrument in their musical repertoire. They spent many hours experimenting and writing within the studio space trying to forge new sounds. According to recording studio audio engineer, Geoff Emerick “The Beatles were trying to push musical and technological boundaries. Engineers and other Abbey Road staff regularly point out that the Beatles would try to take advantage of accidental occurrences in the recording process. The group deliberately toyed with situations and techniques which would foster chance effects, such as the live (and thereby unpredictable) mixing of a UK radio broadcast into the fade of “I am the Walrus” or the chaotic assemblage of “Tomorrow Never Knows” (The group would frequently refer to this method as ‘random’ although it is more correctly described as chance determinism.)”

This kind of creative ambition is something that should never be limited by the studio environment. The needs and ideas created by the artists should be something that influences the way space is formed. This therefore necessitates a dialogue between user and space, making amenable space something that is advantageous to the creative process. Through the creation of this think tank of artists, there is an enormous potential for users to experiment with other artists, spatial configurations, and techniques to unlock potentials for innovation in the field.
CHAPTER 1 - END NOTES

After studying projects and readings that address issues of flexibility over various scales and duration of change, it has become evident that flexibility in buildings can be classified simply into three categories: Fixed, Cyclical, and Evolutionary. A Fixed building is one that functions most like any traditional building. Its form is rigid and static regardless of the changing functions within the building. Often, people are forced to accommodate to a space as opposed to the space conforming to the user’s needs. In regards to this thesis, this method is the antithesis of what is trying to be achieved; the scope of time considered is narrow and immediate, leaving the users with a space that is based purely on prediction, which is impossible to achieve with any degree of accuracy.

A Cyclical space is one that can be found in buildings that are more sensitive to change and adaptation. These types of buildings possess the ability to transform their space or building into multiple configurations to accommodate different functions over time. An example of this is the Suitcase House by Gary Chang. The implementation of Cyclical design allows the space to accommodate multiple uses and configurations by opening and closing hatches that instantly transform the function of the space. This type of design method does a much better job of accommodating multiple needs but is still based on predictions, simply more of them. The fault in this type of design is that throughout its multiple cycles, it is never capable of accepting longer types of change. The cycle will continue until the building is no longer useful and is therefore incapable of learning.

The third type of adaptation is Evolutionary; it follows a changing path in which functions and spaces change according to shifting needs or desires. The difference from a cyclical change is in its ability to learn from
previous uses. It allows for the space to be re-configured multiple times, but each time is capable of answering the hypothetical question “If you were to do that over again, what would you do differently?” By designing with an evolutionary mind set, a stronger balance can be achieved between user and designer. The advantage of this type of space is that it allows for continual input from different groups. They all bring their own levels of expertise; designers are obviously trained to coordinate construction, function, and aesthetic appeal, and users have a masterful knowledge of how their trade or use should be carried out. Through this type of collaboration, the design is allowed to play to its strengths rather than opposing opinions.

A good example of this type of space could be found in the design of the Charles Wyly Theater’s main space, designed by REX Architects. The theater design is meant to liberate the user from conventional configurations allowing the space to account for unexpected events to occur. In some of the diagrams, as seen in Image 14,1 REX accounted for these unforeseeable occurrences, and gave some extreme examples of how the space could potentially be used; one example had a city wide parade travel right through its space. It is in this type of freedom in architecture that space can create limitless possibilities and be prepared for the future.

These three basic types of spaces provide examples that move from least flexible to the most flexible. In studying each type, it becomes evident that two types of influences emerge which impact how a space is formed; designer scripted and user defined.
A designer scripted space is a more typical trend in which designers have the majority of control in how space appears and is used. Designers create a space as they see fit for a given set of design criteria. This type of involvement is based mostly on prediction and therefore relate to the concepts of fixed and cyclical change. Designers have often attempted to provide flexible space for clients by designing multiple configurations and operable pieces within buildings, but until user feedback is returned to the designer; spaces remain only predictions; there is no dialogue between the two. Designers provide a high aesthetic and tectonic quality but lack the guidance and intimate knowledge that is gained through everyday use and interaction.

User defined spaces are more evolutionary in nature and allow user actions and habits to become embedded into the space allowing it to learn. This can be challenging because initial parameters must establish how users will interact with the space while still allowing it to be impressionable. Designed spaces are meant to accommodate users, and users are what influence the design therefore it becomes a problem of “the chicken or the egg; which comes first?” A possible response is to suspend the length of time it takes to construct the space. This concept was used by a planner who built a new college campus initially with no paths and waited until winter to study the snow track that students left behind as the basis for her design. By allowing certain aspects of the buildings to build themselves naturally, user interaction can help explain the story of how space is used. Space is therefore derived around habit rather than predictions, but that is not to say that architecture cannot in turn influence the way users interact with space. Through the interaction of user and space, buildings can learn how to perform.
To help guide the discourse of how to create evolutionary space, the chart on the left is designed to give an overview of some key terms and concepts that have emerged out of the collected research for this thesis. Significant buildings and writings that deal with change and flexibility have addressed some similar issues and topics all to varying degrees. While some projects briefly touch on a few of these topics, others have taken a prominent stand on addressing and evolving the issue. These influences are illustrated in the diagram on the left by the marks that are annotated more boldly.

Each concept has a varying degree of influence on how one can achieve an evolutionary space, and can be organized into three categories; guiding attitudes, design guidelines, and other considerations. Guiding attitudes are pieces that helped to establish the correct questions for the thesis, while design guidelines are works that are incorporated directly into the design process. The third category, considerations, is a series of issues that are relevant to flexibility in architecture, but not directly related to the design process of an evolutionary building. The following definitions offer a quick summary of terms and ideas that will be further explored throughout this thesis and help define strategies for flexibility in architecture.

UNSCRIPTED

Unscripted space is one that allows for an open-ended incident or event that was not intended or foreseen in its original conception. The term has been derived from the writings of both David Leatherbarrow \(^2\) and Laurence Halprin \(^3\). Both describe how buildings are subject to change and different
users over time. This creates a situation in which space can respond to the change in a positive or negative way depending on how robust the space is designed.

SCRIPTED –
The term ‘scripted,’ in this context, refers to a general path or guide for how something is intended to be carried out. Laurence Halprin uses this term as a way to describe how improvisation can occur within design. It allows for the space to address specific criteria while also leaving secondary aspects open to interpretation.

PERFORMANCE –
Performance based design is the emphasis of function and user experience over aesthetic qualities. This concept by David Leatherbarrow promotes the consideration of buildings to respond and engage with the users and the activity taking place within the space.

MULTI-VARIABLE –
The consideration of dynamic circumstances that occur within a building once people are added into the equation that allows space to more readily respond to multiple situations. One building that uses this technique is the design of the Wyly Theater by REX Architects in which the design of the theater space is able to accommodate a variety of theater type situations allowing the space to respond to different needs and configurations.

FAST / SLOW –
A concept coined by Steward Brand used to describe typical responses to changes within a system that allow it to learn and evolve. Some changes will occur rapidly, while others will come into fruition slowly. A simple analogy would be conservative versus liberal political views in regards to issues of change. This concept is later translated into buildings through the concept of High Road / Low Road.

HIGH / LOW ROAD –
Two attitudes that address how a physical space can evolve over time. High Road buildings mature slowly over time with a large initial investment in materials and lasting construction. The Low Road, counters by using quick easy and disposable solutions, allowing a space to more readily change.

SCALES OF CHANGE –
This a response to the variation of size, impact, and duration of change that can occur within a system. Brand and Deleuze use this concept to attend to the fact that different scales of size and time require different sets of criteria to be addressed and therefore necessitate a different set of criteria.

SCALES OF NOW –
A relative attitude towards time; Hour, Day, Week, Month, Year etc. This is a subsidiary concept to the scales of change that deals with different issues when considered at a different scale. This allows a design to be
STRAATEGIES FOR AN EVOLUTIONARY SPACE

more holistic in thinking of both immediate and future needs. 12

SCENARIO BUFFERING –
The term Brand uses to describe how consideration for multiple scenarios can alleviate problems that may occur when dealing with an uncertain future.13 This strategy considers change and growth at the forefront of design and planning to embrace opportunities of future changes.

MAINTENANCE –
When studying any system over an extended period of time, maintenance is the response to weathering, use, and time. This is one of the four criteria for change (maintenance, fashion, program and user interaction) which responds to upgrades, alteration, and retrofits within buildings.

FASHION –
Fashion is another criteria for change within a system because the physical appearance of a building or style deals primarily with aesthetic qualities that are often superfluous and opinion based and constantly changing. Fashion can also serve as a means to demonstration the use of the space. For example, if the space is meant be considered in a low road way, durable and deconstructable materials should be used to promote it. 14

PROGRAM –
Program refers to the intended function or functions of a space that are considered. Often throughout a buildings life the program of a space can change from one use to another, or in some instances even overlap with other programs. Consideration for the future programming of a building can allow the building to more efficiently transition into a new use.

USER INTERACTION –
The interaction and engagement of users with their surroundings allow the space to perform. Users can often change or have different needs within the same building or space. This is therefore closely related to the issues dealt with in programming.

STATIC FLEXIBILITY –
A stationary space that does not involve any movement and does not respond to user needs through a physical means. If designed properly, phenomenological methods can establish hierarchies within a space to create spatial orders within a system allowing multiple configurations of space without the need for physical transformation.

DYNAMIC FLEXIBILITY –
Space that is capable of physically moving or transforming through user interaction and involvement. This type of movement can address issues of fashion, program, and user interaction, and in some cases maintenance through the re-configuration of space such as operable walls, floors, and ceilings.

TEMPORARY –
When the transformation of a space is not considered permanent and is intended to return to its primary form and function. These types of changes could be based off the season, time of day, or occurrence of a special event.
STRATEGIES FOR AN EVOLUTIONARY SPACE

SPECIFIC FLEXIBILITY -
The consideration of flexibility within only a specified area of the design. This separation allows the design to address issues of flexibility much more intricately by allowing it to adapt to the issues at hand, instead of the entire building. A good example of this is found in the Seattle Public Library. The stack area was designed to grow over time within its defined area, allowing the important public areas to not be overtaken by its growth.  

INTERCHANGE -
The substitution of one program for another within the same space to allow for overlapping uses. An example of this is the Charles Wyly Theater, which allows different types of space to be ‘flown’ in to the same area. This is distinguished from the term ‘Universal Space’ due to its specificity in the type change that will occur.

LINEAR -
A linear transformation is one that occurs over time and is continually added to or refined, based off growth and change throughout its use. Amongst the four methods for change previously listed, this is the closest assimilation of evolutionary and highroad design strategies.

GROWTH -
A reason for linear transformation to occur in which the space can increase in size and functionality over time accommodate change. This can simply be thought of as an addition or expansion to a building over time.

UNIVERSAL SPACE -
A term used to define a space without a specified use, but able to accommodate many other uses. These types of spaces are often limited and don’t provide the proper infrastructure to accommodate “all uses,” therefore requiring a great deal of alteration or construction. Without specificity these spaces often take on the characteristics of a warehouse.

As mentioned before, these issues and topics all have varying roles and degrees of influence within this thesis. Some of the earlier terms used by Brand and Leatherbarrow, such as scales of time, and performance have set up reasons for implementing change and flexibility within architecture. Now is the opportunity to use some of these concepts to establish the tools that can allow designers to accommodate these reasons for change. The next two chapters will begin to discuss a few of these concepts a bit further, establishing methods and design strategies for creating a music writing, recording, and performing studio that demonstrates evolutionary characteristics.
CHAPTER 2 - END NOTES

1. Rex Magazine (FINE SOURCE)
16. REX. (2009). *Charles Wyly Theater*
Because the crux of the thesis is based around change and time, both of which are unpredictable, it is essential that we as designers give up the fantasy that our designs will be all-knowing and correct. The chaos of the unknown event will always occur and should be embraced in a positive way. Change is what gives our environment character and life. This calls for implementing strategies for design, not a plan. If the word “plan” is used, it implies too much specificity and too much direction. A strategy is perhaps a more appropriate term to use because it allows for a more nebulous course; one that provides breathing room. It can allow for change to occur on-the-go more naturally. This is the concept that Stewart Brand refers to as “scenario buffering”\(^1\) which is a term borrowed from several other fields of study that developed these concepts to allow a system to move forward in uncertain times. This concept originated in fields such as the military and volatile business markets to increase their chances of success.

The traditional building structure follows a path very similar to the diagram shown on the left of this page. A clear problem is addressed and resolved, resulting in only one expected use that has a limited view of the issues and only a short scope of time is considered. If the scenario buffering strategy is implemented into the design process, multiple factors can be accounted for on the front end of the design process. This allows for the design to maneuver more easily around conflicts that arise when confronted with unexpected scenarios. Even if all the scenarios don’t have specific endings, consideration for an ‘outlet’ can provide the opportunity for the client and designer to address the unexpected event more easily when, or if, it does occur.
Flexibility within space can allow for the building to become an experiment. According to Stewart Brand, there are two major paths through which buildings can learn: the “High Road” or the “Low Road.”

The High Road places a large investment up front to make the building robust and lasting. Investments in durable lasting materials, solid foundations, and excellent craft allow the building to better resist the punishment of time, letting it wash away the original intent slowly. This allows the design to evolve into a mature functioning building through use and weathering. Through the exposure of time, space can gain the experience and inherent knowledge as to how it should perform; whether it performs efficiently or not is something that is up to the user or owner to adjust or modify appropriately over time. Brian Eno was quoted to say “I think that humans have a taste for things that not only show that they have been through a process of evolution, but which also show they are still a part of one. They are not dead yet.”

The Low Road is the more disposable solution to change; nothing will last, so why make a large investment? Through disposability, designers and users can liberate themselves from many factors that would otherwise stop them from altering a High Road design. By using this method, there is less invested value. This gives people the freedom to completely wipe a space clean and start anew if the space no longer functions as desired. A more liberal attitude can govern the space allowing the building or space to become more progressive. This strategy can set the space up for either great success, or failure, but regardless, is still capable of learning without suffering any substantial loss.
As with many things in life, a balance is always sought to be achieved. By following Brand’s concept of the high and low road, one can move beyond to instill both of these concepts within building designs to allow spaces to become both progressive and reliable at the same time. It is the combination of experimentation and tried and true methods that can help a building to learn and adapt over time. The Undulating Ascent walks the fine line between the ‘High Road’ and the ‘Low Road’ letting the users and occupants learn from the mistakes or advantages of the space. The responsibility for a buildings potential to learn lies in the hands of the person that will be with the space for the longest period of time. In the example of a recording studio, this would be the managerial staff and musical technicians; they have the duty of maintaining the High Road knowledge of the space while also letting temporary users experiment in a Low Road fashion. This is a concept that will be further discussed in the section titled “Three Authors” which proposes a method to rethink the way groups interact and dictate the form, space, and use of a building.

This notion towards a building capable of learning is best described by Steward Brand in which he stated, “Let people try things. When some of them don't work, honor the effort, notice the lesson if any and move on.” Buildings can then learn to perform best through repetition, not through anticipation.
PROGRAMMING AS A TOOL FOR TIME

Programming has typically been used as a tool to assess and evaluate the needs of the users making the building specific to their needs and point in time. This is a very successful technique if the users considered are the permanent occupants of the building and the function of the building will remain unchanged throughout its life. This, however, is almost never the case. The major shortcoming found in programming is that accommodations are usually made only for immediate needs. Future users, new functions, and new technology are just a few examples of changes that will occur; and ultimately have an impact on the way buildings function and look, but are rarely considered. The requirements of various users should be expanded and considered more broadly in order to more aptly deal with dynamic conditions.

Considering how a building will currently function is something that most businesses or clients are interested in because it is only for their use; why should they be concerned about the next user? It can be argued that a building that can accommodate different needs and users can help the building to become more marketable and profitable. This was the driving force in the design for the Blue Cross Blue Shield building in Chicago, designed by Goettsch Partners. The concept for the high-rise building was scenario based. The BCBS owners came to the understanding that after construction, changes would inevitably need to be made within 10-15 years.

The final concept developed by Goettsch Partners was to implement the possibility for a vertical expansion of the initial high-rise building. Along with this vertical expansion and flexible core and floor plan layouts, the building was able to accommodate a variety of possibilities. Among the possibilities was the opportunity to not continue with the vertical expansion if the company didn’t grow enough. They could also continue with the expansion to provide more office space. The third choice, which is currently being implemented in 2008/09, is to complete the vertical expansion with the intent to lease out the remaining floors that BCBS aren’t yet able to fill. Through planning with forethought, the core layouts and floor plans were designed so they could easily be partitioned into smaller parcels, allowing the building to market itself to both large and small office types.
Using programming more dynamically sounds like a relatively straightforward task, but in reality an intricate knowledge and study of how the clients and users work and operate in the past, present, and future is necessary in order to plan for the future. To understand how a building functions over time, one could perhaps compare the transformation of the building to a script or choreography. By relating the concept of scripting to programming, a more holistic standpoint can be achieved to help give perspective to the changing needs of buildings over time. It can serve as a tool for framing the possible outcomes of a fluctuating program and establish how it might be planned.

When looking at scripts and choreography, there are some important aspects that can be derived to help enrich the way designers think about architecture. The definition of a script is a plan of action, and the definition of choreography is a figurative plan and control of an event or operation. These both lead the design towards a more open-ended result that can ideally find a balance between instruction and interpretation. While this strict definition of certain constraints gives direction and structure to the process of programming, it can also, at the same time, allow for some improvisation and undefined events to occur.

If one were to use a pure scientific method of deriving the knowledge needed to design a building, a drive towards perfection would typically be the resulting goal. Perfection, however, is something that isn't possible or even desirable when dealing with the complexities of human interactions and lifestyles. According to Laurence Halprin, in his book RSVP Cycles, “We can be scientific and precise about gathering data and inventoring resources, but in the multivariable and open scoring process necessary...”
for human lifestyles and attitudes, creativity, unquantifiable attitudes, and openness will always be required.” 6 By using the concept of scripting in design, which is more anticipatory than goal driven, designers can think more broadly about the outcomes of their designs.

To help explain how a script can be both definitive and interpretive at the same time, one can look at the “Dance Diagram” paintings created by Andy Warhol in the 1960s. This series of diagrams is able to script out the key components to identify the basic dance gestures but describes nothing about how the participant should move their upper body. Movement with their hands, shoulders, hips, and head, or even what type facial expression they have, are all factors that have been placed in the control of the dancer. If fifty people were to perform this dance with only this as their instruction it would probably be interpreted in fifty different ways while still maintaining its identity as the same dance. The interest in this lies in its ability to learn and evolve over time. In writing a successful script it is challenging to balance that which is defined and the rest which is left open to chance. The opportunity can be found in the ability of the script to take the variables of unforeseen events and use them as something to react against. This allows the script to perpetuate, making it self-evolving.
CHAPTER 3 - END NOTES

When applying this concept of scripting to the musical recording process, one can start to understand the basic needs and concepts of the identified user types. In studying different musical types, it is evident that varying schools of thought occur within the musical culture. The two polar opposites are sonic exploration and musical precision, therefore, five different musical types will be considered for this project: digital musicians, rock groups, soloists, jazz musicians, and orchestral groups which range from the exploratory to the conservative end of the musical spectrum. Most recording studio spaces are often designed to accommodate only one or two types of users which is perhaps a missed opportunity because innovative ideas come out of collaboration between opposites and cross-pollenization of ideas. If space can therefore accommodate all types of groups, then the blending and mixing of creative ideas can invigorate and charge the way artists create and perform.

To understand how to accommodate these users groups, basic oppositional variables can serve to identify and describe the important aspects of each type of group. After researching typical trends and habits that occur within different types of musical groups, generalizations and trends were able to be made. To help establish some of the future constraints that the user groups will impose upon the design of their space, a range in size and number, type of recording style, and mode of work are all to be considered. To visually map these trends, a three axis grid was used to establish the oppositions; solo vs. ensemble, scripted vs. improvisational, and live vs. multi-track. By diagramming these spaces in this manner, spatial and design considerations can start to be extracted to form their basic needs which can be seen in figure 31b.
To further understand these spaces, they need to be compared to each other according to their spatial relationships and over a duration of time. These scripts can be seen in Image 29 and show each of the groups and their tendencies. By adding these variables, one can see how the flow of the building might start to look. The script shows when the group will be operating in which mode (writing, recording, or performing) at any point in the process. It also demonstrates some characteristics about how they are operating; large vs. small configurations and improvisational vs. scripted working methods. The width of the ribbon that follows the bands movement also describes the amount of freedom the band will use during that time; a thicker segment implies a more free, open-ended, and explorative nature to the space, while a narrow ribbon describes a highly controlled setting such as a performance or multi track recording session. This accounts for the creativity and experimentation that exists throughout the entire process.

The duration of these segments can, and should be manipulated and scaled to accommodate different needs of the users, but this particular script offers a general scenario in which to work from. After the script is in place it is necessary to manipulate and shift the scripts to coordinate their time and relation to each other. It is not likely that all five groups would begin at the exact same time therefore no more than two to three groups were allowed in the performance and recording spaces at the same time.

Image 29 - Scripted Trends of Five Music Types

It is apparent from these diagrams that a general evolution typically occurs: a linear progression from writing to recording to performing with an increasing amount of precision and specificity occurring as the artists move towards the end of their session. The next step is to coordinate these overlapping functions to either work with each other or be dispersed along the time line when major conflicts arise. The trends have been diagramed; it is now time to orchestrate them into a well designed composition.
Orchestral groups place an emphasis on precision and musical quality. The main goal of an orchestra is to perform live. The process begins with a composer or writer creating a musical score. The music is then taken into a rehearsal space where the orchestra repeatedly practices their pieces to master each part: this is the time musicians and conductors use to improve and make changes to get the sound precisely the way they desire. The third step is to then move into the recording process which is heavily constrained by time and money, requiring the orchestra to work with efficiency and accuracy. The final phase, the live performance, is where the pride and prominence of being in an orchestra is found and a finely polished product is the result.  

Jazz groups are the “anti-technology” rebels of modern music. They have maintained a loyalty towards the performance of music and take pride in the artist’s ability to improvise and become “a part” of the song. Jazz groups typically start by hosting jam sessions either live or in a rehearsal space and develop songs through repeated performances. Technology is only used to capture an excellent take of a particular solo or section of a performance. In this regard, the music creation tends to be very loose through most of the process with specificity occurring only towards the end when songs have had time to mature and grow; therefore, jam sessions and live performances are most important to this process.  

The Soloist is perhaps the most difficult to define a process for because their technique might vary from album to album, or even song to song. They will typically write a series of songs or have material ready and bring in other artists to help perform the piece. The amount of collaboration and solo work is fairly evenly distributed, and studio versus performance time has equal emphasis. The soloist really takes advantages of techniques from many different genres, and is the middle ground for many types of musical explorations.
The Rock Band has always been the staple for sonic exploration since the 50s. Exploration and rebellion from traditional music has led to the creation of audio effects such as feedback, distortion, and reverberation just to name a few. They have all primarily been creations by rock bands through exploring possibilities of sounds in the studio. Most of the emphasis for this group is placed on exploration in the studio and recording process with an embrace for chance and “mistakes.”

Digital music is something of a recent development and is primarily created only by one or two people. Digital musicians are typically trained to use some type of musical instrument (or multiple) and record “samples” of music to then be digitally dissected, altered, rearranged and collaged back together to create music. Because their work relies heavily on technology and equipment, they tend to spend most of their time in studio spaces, working with computers to forge their new musical sound. Digital musicians much like rock bands are in search for new types of sounds and music creation where they rely heavily on chance and exploration.
SCRIPTING TRENDS

If this project were to be considered a reality, coordinating the different bands would be a somewhat challenging task at times. It would most likely be undertaken by the managerial staff operating the building. In doing this it gives the control of the space and the building to a ‘master’ of the given field. This allows the musical experts and technicians to control and dictate how the space will be used. The illustration below shows the previously scripted paths arranged and organized over time to allow the building spaces to coordinate with each other. Although these given scripts are somewhat generalized, it is not difficult to understand how they might be altered or stretched to accommodate individual needs or new types of musical recording processes. This chart is meant to serve as a guide for how the building should work and is meant to invite change.

After the building is designed through these generalizations, it will be necessary to retrace some of these diagrams to understand how the design will accommodate the changes that occur over time. If properly designed, the new building strategy would hopefully in turn have an affect on how this typical recording script might look. For example, some transitions between spaces might be more frequent, such as moving from writing to performing, or recording to performing. Another possibility is the crossing of different musical types to become actual physical connections within the space which incorporate more collaborative experiences. The alteration and actual affects of this chart from the proposed design could provide numerous opportunities for new uses and trends develop out of this building design strategy.
Once the script is understood, it is necessary to understand how the diagram can be translated into a physical form. Relationships can be established vertically and horizontally across the chart to describe how transformations of similar types of space occur and how spaces and users transfer from one function to another. When studying the types of transitions that occur, it is important to understand what spatial and objective constraints are considered most crucial to the space. Writing and teaching spaces will have less acoustic requirements and the transformation of the space must act in a more Low Road fashion to allow for experimentation and improvisation. Recording studio spaces have a much lower tolerance for acoustic imprecision and are technically driven. They are designed around acoustical control and precision while still allowing for some, but not as much, manipulation of the space as the writing spaces. And the performing space is balanced somewhere in the middle by combining both technical requirements and multiple configurations.

By establishing the extremes of the space, it is possible to design for the most difficult conditions and then work backwards allowing the less constrained spaces to be fit within it. For example, if there were two types of spaces that needed to be combined into one, a soundproof room and a non-soundproof room, it would be much easier to create a space that was designed to be sound proof initially. The non-restricted space can perform just as easily in both spaces but the constrained space cannot. Through analyzing these types of constraints, it is possible to understand the limits of the design and then work within them. As long as one constraint does not interfere with another space's performance, they can easily be combined.
Within this design, it is evident that the three basic types of spaces considered, writing, recording, and performing, will each have different objectives for which they are to be designed. Using the ideas of fixed, cyclical, and evolutionary flexibility types (Image 34a) allow the design to tailor solutions to different instances in order to best resolve the space. Because of the different requirements of these spaces, the concept of ‘specific flexibility’ can be introduced to alleviate the burden of trying to find one solution to resolve all the issues. Certain elements of the building, such as structure, plumbing, and circulation, which can be generalized as infrastructure, won’t necessitate change. This allows the infrastructure elements to be resolved in a fixed manner. In this situation, there is no real advantage to move bathrooms, elevators and stairs around because the costs outweigh the advantages. Certain elements are better off static.

Elements such as the recording space have some highly defined spatial and acoustical constraints that should not be modified to any radical extent. These types of spaces therefore take on a more cyclical type of flexibility. The types of groups using the recording space have already been setup therefore some basic “rules” can establish the different configurations based on size, shape, materials, equipment etc. Because the uses of these spaces are relatively set, the amount of change occurring within this space will mostly be limited to the interchange of different user types. As shown in Image 34b, the designer is confronted with tight acoustical and technical requirements that will remain relatively unchanged throughout the use of the space. This places emphasis on the duration and lasting qualities of the space therefore relating to High Road methods.  In a similar manner
THE [UN]SCRIPTED SPACE

to the Seattle Public Library, specific flexibility strategies can account for change and growth that will occur in the space slowly over time through use and interaction. Strategies for other possible configurations and the use of semi-modular systems and grafting of new systems can allow for gradual additions to the space over time. This allows it to change out or add materials and fashionable qualities to the space which may change over time. This will also allow the space to react through an interpretive script; the major constraints are addressed and remain constant, while others are open to change.

The third type of space that accommodates writing, teaching, and circulation space is identified as the interstitial; space that occurs between designer scripted spaces, fixed areas, and the exterior envelope. The concept is to use this area as a relatively unprogrammed space to allow the mixing of artists. This mixing space is designed to promote the idea of a music think tank within the recording studio building. The incorporation of multiple program types within one large circulation space is meant to create moments of intentional chaos and collisions. By using Low Road construction and treating hallways and writing space essentially the same, artists are forced to interact to some degree or another. Even if an artist is content with working alone, there will always be instances in the building in which he or she is forced into some kind of interaction with other artists. This collision might be as simple as overhearing someone else writing or singing while walking through the building, or as intimate as starting a conversation with an artist from another genre of music that may lead to a great new collaboration.

THE [UN]SCRIPTED SPACE

The interstitial space also demonstrates the characteristics that are most appropriate to a user defined area. This is achieved by allowing the users to have the predominant authority over the quality, feel, and look of their space. Because of this, habits and use can be traced over time to inform how the building can learn. The architecture within this type of space needs to be easily accessible and capable of quick alteration in order to promote user interaction within the space. This necessitates an initial gesture by the architect that is capable of receiving quick criticism and alteration by the user which lends itself to Low Road concepts.

As seen in the diagram above, the space is initially designed then altered within the first few years of occupation. After the building has had time to mature, the trends of the users have more than likely made their mark on the space which gives the designer or owner the ability to critique their building by studying what has been or would be useful in the future. This can allow for the building to maintain its performance by regularly giving itself a checkup and critiquing its own use.
THE THREE AUTHORS

Most buildings typically have a general organization and hierarchy that establishes how space is dictated, organized, and used. The three groups or ‘authors’ of the space are; the architect, building manager/owner, and the user. Each of these groups bring a different quality to the space as defined before as the High, Low, and Equilibrium strategies. The architect is responsible for the duration and permanence of the space that addresses High Road concepts. The users are constantly changing and add a variable element into the building by always looking to push the boundaries and innovate. The building manager is then the equilibrium between the two which deciphers what was done in the past and how it will be useful in the future within the buildings costs, expenditures and infrastructure.

In a traditional model, the architect will design a space as they deem appropriate with some input from the managers and users. The space is finished and then handed over to the building managers. It is then their job to understand and determine how the space works best for the process and trends in the field. The final group, the users, are then told where to go and how to use the space. This group is meant to be the one that experiments and innovates the most and must do so within the constraints that the two previous groups have established. Space has therefore already been significantly restricted from any change or influence by the user group over time.

To critique the current hierarchical system, a proposed collaborative methodology will begin to break some of these boundaries between user groups. Each group will still maintain their High, Low and Equilibrium roles within the building but a blurring between authorities will allow each group to have some level of influence on how the space is formed. Through the building design strategies, the architect can implement ways to allow the spaces to be defined by the groups that have the most knowledge and expertise of the given issues. This strategy allows the authorship to play to its strengths. User Defined spaces will be decided by the musicians, the Designer Scripted spaces and Performance spaces will be influenced primarily by the managers and musicians, while all working within a flexible frame work established by the architect. Through this collaboration, the building form will be derived out of the trends from the most influential people.
CHAPTER 4 - END NOTES


2 JAZZ NEED TO DOCUMENT SOURCE


5 DIGITAL NEED TO DOCUMENT SOURCE


8 Ruault, P. (2009). *Seattle Public Library*


OTHER CONSIDERATIONS

There are numerous paths that one could follow when studying reasons why and how flexibility should be implemented into architecture. This thesis chose to focus primarily on those that resolved issues of how buildings can learn and evolve over time. Other issues that have been considered demonstrate techniques that are valuable to the creation of flexible space, but are not as strongly related to strategies for an evolutionary space. These concepts are worth pointing out as they provide some good examples and considerations for designing flexible spaces.

This chapter will provide some examples and analysis of precedents and issues that will be considered within the scope of the design work. The following section is comprised of four major parts; Scales of Change, Criteria for Change, Perception of Flexibility, and Precedent Analysis. The scales of change section will discuss numerous projects over different scales of time and size to show their trends. It will also look at how some less common techniques can be exploited. Criteria for change deals with three initial studies that served as basic conditions for change in architecture. Each one of these sections could easily be broken off into its own discourse but only pertinent factors from each section will be discussed and incorporated into the design. The third section, perception of flexibility addresses the possibility of solving the transformation of space through both static and dynamic methods. The final section is the precedent analysis of two projects that have been able to incorporate many of the ideas that have been previously studied throughout the thesis and will serve as a guide to the final design.
There are numerous examples in the field that address different scales of time and size of change as seen in Image 39a. In studying some broad examples about how architecture utilizes flexibility, a few simple groupings can be formulated to capture the ideas of these different types of flexibility. These groupings can be simplified into the terms; Linear, Temporary, Multi-function, and Specific Flexibility. (Image 39b)

It is apparent that a logical pattern occurs within the diagram (Image 39a) which shows that movement from shorter to longer periods of time is directly related to the scale of change being made; more rapid changes are associated with a small scale and longer durations are large scaled. Some points of interest are the abnormalities and blank spaces in the scales chart (Image 39a). For example, large scale changes that can occur instantly or small scale changes that occur over the lifetime of the building such as the 33 year creation of the Watts Tower by Simon Rodia are issues that are rarely considered. An example of a project that addresses building changes at an hourly or daily time scale might be the Wyly Theater by REX Architects. The program has a vertically orientated layout to allow different theater configurations to be quickly dropped into place from above which again relates to a more Low Road concept. To address the opposite end of the spectrum and High Road transformations, explorations by David Leatherbarrow and Carlos Scarpa might be considered because of their pride in the duration and use of details and materials that gain character over time through weathering and use. It is in these extreme cases that potential could exist to create atypical architecture. Buildings could then respond to a greater degree of change to aid the development of its function and character over time.
A linear transformation is one that often allows buildings to change over time based on the expansion or re-configuration of space. It could perhaps best be compared to the additions of buildings; expected, or unexpected, growth to the building which alters the way users perceive the space. An example of the Linear transformation would be in the design of the Blue Cross Blue Shield building designed by Goettsch Partners. The project is a Chicago skyscraper that was designed with the potential to double its height after 10 to 15 years to accommodate growth within the company. The vertical expansion phase is currently in process and is almost complete. When finished, the building will be able to re-configure its layout and function to restructure the way the company is run, which has inevitably changed since its original build. This type of transformation typically occurs at the building and urban scale over a longer duration of time.

The next type of change is Temporary, where transformations occur within a building or a site over a relatively short time period and have the intention of returning to their previous state. They are momentary in nature and provide a simple A-B-A transformation of the site or space. An example of this type of change is the design for the 2016 Olympic Stadium by Goettsch Partners. The Olympic Stadium is a completely temporary venue in which the area transforms from an open park, to an Olympic stadium, and then is disassembled and re-appropriated to allow the site to transform back to the original park. This type of change occurs at a larger scale over relatively longer periods of time, but some more readily performed transformations can also occur. The Fukuoka House by Steven Holl and the
Schroder House by Gerrit Rietveld provide good examples of this. Both of these spaces take advantage of folding and sliding doors to allow the user to configure the same space in multiple ways, giving the same area two different functions. These designs allow for the transformation to occur at a more human scale, making the space transform over a short period of time at the convenience of the user.

Multi-Function is the third type of change that occurs in buildings. Its characteristics are similar to Temporary Flexibility in the fact that it has an A-B-A pattern but rather than having a major transformation of space, multiple functions are overlapped within the same space. So instead, a space could now be described as an A-B-A-C transformation and is more readily changeable. Some examples of these projects are the Pompidou Center by Rogers and Piano, and the Gucklhupf by Hans Peter Womdl. The Pompidou was designed with the intent of having wide-open floor plates and adjustable floors to accommodate various functions within the same space.\(^3\) The Gucklhupf is a temporary structure designed to accommodate various functions and programs throughout the seasons through the use of sliding, hinging and operable partitions. The multiple functions included in the design include spaces for poetry reading, bird observatory, and musical performance in the summer while also possessing the ability to transform into a meeting hall, boat storage, and bath house in the winter months.\(^4\) The success in this project can be found in its ability to merge all of these functions into form. These projects predominantly have mid-scaled changes which are at the scale of the body and building and can occur over most durations of time.

The last category of change is Specific Flexibility which is a type of hybrid between the previous types of flexibility. It involves particular program types that deal with large amounts of change and others that are less open to change and have very specific use. An example of this is the Seattle Public Library (Image 41). The main areas of the library were separated into different volumes to provide flexibility within those limited uses, while allowing the interstitial spaces to be open and flexible. The stacks were designed as a continuous floor that runs uninterrupted for several stories creating a linear numbering system for the books. In doing this, the need for expanding the stacks and the creation of ruptures in the flow were eliminated because new stacks could simply be added in between the existing stacks. In a similar manner, programmatic likenesses were grouped together to establish clusters that could perform without compromise from outside factors.\(^3\) This type of change, Specific, can occur at various scales depending on the space being described; the highly changeable and less defined spaces transform over shorter periods of time at relatively smaller scales, while the more controlled spaces are susceptible to slower changes that occur at a large scale over a longer duration of time.
Buildings are continuing to change at different scales of time and size. There are three basic criteria for change that naturally occur throughout a building's life. These criteria are maintenance, program, and fashion. These changes are typically inevitable and warrant a closer investigation in order to allow buildings to maintain their performance mechanically, functionally, and aesthetically. By considering these factors in a more extended view, their inherent challenges can now become opportunity.

Humans have always proven to be one of the most flexible ingredients in the mixture of components that make up a building. The argument should be made that, although it is possible to have a separate room for every function, it would become excessive, unnecessary, and in some cases hindering to provide spaces for each condition. In the case of musicians, it is important for them to always be with their instruments and equipment which can take quite a long time to set up and take down. The amount of effort and work could be lessened if some functions could be interchanged or overlapped within the same location. This allows the artists to stay with their instruments and let the space be configured around them. The interaction of users and space is something that requires a close dialogue to exploit the performance of a space. Reactions to changes in maintenance, program, and fashion are things that should be welcomed to keep the dialogue between user and building open.
MAINTENANCE

In order for buildings to maintain their life and productiveness, upgrades, maintenance, implementation of new technology, and upkeep are all a part of the process a building goes through. It is a natural process that comes about with exposure to time. As studied by David Leatherbarrow and Mohsen Mostafavi in the book, *On Weathering*, some buildings take these factors into consideration, while others don’t; it is the difference between use and abuse. Use becomes an additive process in which function or desire increases over time, while abuse is reductive, leading to deterioration and need for replacement. All things are subject to weathering, but some accept it better than others. In relation to architecture, it is important that considerations be made as to how long building components are meant to last.

Technology and upgrades are an inevitable change that people will try to force upon buildings whether they are capable of receiving them or not. The reason for change and upgrade is the increase in the efficiency of the component replaced. A new heater will run more efficiently; wireless Internet will take up less space, and by the time these improvements become defective, even newer technology will be ready to replace the replacements.

Stewart Brand states “the march of technology is inexorable, and accelerating.” Improvements will always find their way into the projects because of their appeal of better performance. Not only do buildings need replacements to keep up with technology, but also simple wear and tear through repetitive use on buildings can take its toll over time. Often with these types of replacement, upgrades are also implemented. For example, if the glass in a building was all made with single pane windows, it would most likely be replaced with double pane or insulated glass to increase its thermal efficiency. Since this type of change will always continue to occur, it should be considered a given and therefore a part of the design by considering methods of change and alteration.

Some of the projects in the publication *Archigram*, deal with ideas of planned obsolescence and changeable building components such as the project Plug-in City (Image 43) which is essentially dealing with the issue of maintenance. Different components of the project are determined to have various time scales. Each piece is planned to be replaced or upgraded based on the projected time the component can maintain its ability to perform. Components ranging from bathrooms, living rooms, house locations, workplaces to even transportation and mega structures were given life expectancies. Because the idea that this complex would be in such a state of flux, cranes were designed into the structure to easily
change out components and shift program around. This example is perhaps a bit on the extreme side, but it is not difficult to imagine how buildings already have this type of obsolescence inherently in their design but are designed in a permanent manner. In the design of a music recording studio, it can be seen that this type of readily interchangeable components can allow for new materials and equipment to be easily dropped into place. Also within recording studios, components and recording technology has a life cycle of its own therefore considerations of upgrades and new technology can help extend the of performance in the building.

The Pompidou Centre in Paris designed by Renzo Piano (Image 44), and Richard Rogers, is a project that paid close attention to the use and design of mechanical components in the building. Because the building is designed to be open and flexible, the most simple solution was to move all mechanical and service components to the outside of the building to free up the interior. By moving the mechanical pieces to the outside Piano and Rogers avoided running into problems when trying to re-configure or replace the mechanical spaces each time the interior was to be altered. Also by doing this, mechanical components are easily accessible to allow for easy changes and quick alteration rather than being buried in a wall deep within a building. In learning from this design, the recording studio design will borrow this idea of clustering mechanical systems into specified areas of the building to free up floor plates and free movement within. Elements such as vertical circulation, plumbing, and heating will all be run along a grouped location within the building away from the center of the space.

The Pompidou Centre was also designed to give users the appearance and feel of flexibility. By using a high-tech aesthetic through repetitive steel struts, connections and columns, the structure was to exhibit a clear expression of the performance of the building. Through this perception of flexibility within a space, users can begin to identify with how the space is intended to be used which will be later discussed in the fashion section. The most disappointing issue of this building is that it went through all the trouble of creating a universal space but has not yet been transformed to any great extent. The lack of intent for the transformations causes too much ambiguity therefore the it requires a great deal of ‘other’ construction and elements to be brought in to transform the space.

The issue of maintenance within flexible design requires the building to be thought of as a continual process, not a complete work. The building can become a piece that his capable of growth and advancement. Technology can be upgraded, spaces reorganized, or new and different materials can be used to accommodate the changes that occur within the building over time.
When one looks at the functions that occur within a typical building, it is apparent that certain spaces are more frequently used than others. Some special use spaces have functions that occur only once a day, once a week, or even once a month. These can be a waste in regards to the buildings overall performance. Overlapping layers of programming within a single space can help alleviate the burden of “dead zones” in buildings. These programmatic spaces are not meant to be eliminated because they are just as important as the everyday space, but rather incorporated into the other program space. If functions were conceived in four dimensions rather than the typical three spatial dimensions, less frequently used spaces can be made more flexible to accommodate changing needs.

In looking at a longer time scale, program can also be changed completely in a building, not just transformed. New users can bring their own ideas into spaces, therefore necessitating the reconsideration of the way one thinks about space. If not properly accommodated, this type of change can be difficult to address. Through the implementation of flexible strategies designers can alleviate the need for substantial retrofitting within buildings, which is both burdensome and expensive. Considerations over various scales of time can provide design opportunities and outcomes to increase the buildings longevity and function over time. Within the study of the recording studio the introduction of new musical types can provide an example of this type of dramatic shift. The digital music genre is something that has primarily developed over the past 20 years and was not a criteria for design studios before the 1980’s. By creating a system that is robust enough to accommodate different sizes and configurations the design will be able to accommodate these types of factors.
Fashion is perhaps one of the more easily applied and necessary concepts for flexible and adaptable architecture. It is a premise that is based on opinion; and opinions are changing and controversial, making them unstable. To help explain the idea of fashion, an excerpt from Stewart Brands’ *How Buildings Learn* can best describe its ephemeral quality and need for change.

“Art begets fashion; fashion means style; style is made of illusion (granite veneer pretending to be solid; façade columns pretending to hold up something); and illusion is no friend to function. The fashion game is fun for architects to play and diverting for the public to watch, but it’s deadly for building users. When the height of fashion moves on, they’re the ones left behind, stuck in a building that was designed to look good rather than work well, and now it doesn’t even look good.”

The fashion of a building is really only for the designer and observers; it typically does little to nothing for the users of the space. Because this thesis is argued from the standpoint of performance and functional based architecture, fashion should therefore be only used in a way to help improve the qualities of the building. Fashion is obviously something that can come and go and is often not much more than a veil over the inner workings of a building. Painting, or replacing materials can quite easily change the appearance of a building, but it is important to understand that aesthetics and material choices can also be influential in how the space is used and perceived. If for example, high-end, expensive materials are used, a person may feel the space is very precious, complete, and resistant to change. By using more modest materials or providing
evidence for change, people are more likely to change or alter a form and make it their own. In regards to flexibility in fashion, two main ideas can be perceived: the quick or easy change of materials and color in the building for aesthetic purposes to stay with the times, and the use of materials to explain how the space is intended to be used.

To make a comparison of the disjunction that occurs between fashion and function, or in this example, a concept, one might consider the evolution of the almost half century epic of the James Bond legacy (Image 47). The artwork, the clothing, the way women, men, and sex are represented have all changed greatly, yet the notion of the stories are all generalized around a concept conceived by Ian Fleming between the years 1952 and 1964 and is still the same even in 2008. In this example, the idea or the ‘function’ of James Bond is what has kept the legacy alive for so long, fashion trends have come, gone, died, and become born again since his first appearance on the silver screen. Minor changes are made to the character and story line to keep themes relevant to current times, but through the character’s ability to evolve with culture, it has allowed it to remain a relevant story line. This leaves the belief that the surface isn’t what matters; it is the importance of what the piece does and is that counts.

In a similar manner, the recording studio must always promote its idea of music recording, creating and performing and innovating. The styles, methods, and users that interact with the space will come and go, but the space must maintain a general zeitgeist across the decades while still staying with the times that allows it to gain character and maturity.
PERCEPTION OF FLEXIBILITY

When one thinks of the idea of “flexible” space, movement and the physical transformation of space typically comes to mind. This, however, is not the only strategy that can be implemented to understand multiple configurations of space. Through using concepts of static transformations, ideas of phenomenal transparency and multiple readings can help a single space become dynamic and multifunctional. By providing both clarity and ambiguity, a properly designed space can promote multiple readings that allow an occupant to become engaged in the use and reading of the space; it encourages interpretation, inviting user interaction. Some clear examples of this are the Rubin vase/profile illusion (Image 48a) and the Old Woman / Young Girl painting (Image 48b), both of which demonstrate how a single image can be perceived in two completely different ways.

By questioning how a space should be used, observers become creators. It forces the user to decide how the space should be read and is therefore engaged in its creation. According to Bernhard Hoesli, in the book *Transparency* he states that, “Meaning can thus consist in the ad hoc or repeated identification of the beholder with the object. Meaning then blossoms from personal involvement; it is created in the act of focusing on one of the possible readings of form relations that are latent, inherent or implied in the form-organization.”

Although Frank Lloyd Wright did not incorporate very many features that physically move in his design of the DD Martin house, he was still able to design a static space that could be perceived in multiple ways. He created spatial hierarchies within the cruciform layout of the building through subtle shifts in ceiling heights and wall niches to imply multiple.
spatial readings within a space. Through using this technique, concepts of phenomenal transparency begin to emerge and spatial readings are then placed in the hands of the user. In the case of this particular project (Image 49a), Wright created highly defined large spaces with much more subtle definitions that gradually shift down in scale to give definition and intimacy at a much smaller space that are implied. Even the furniture within the room was meant to define more intimate settings. An example of this is seen in the design of the high back chairs. They define another region around the dining table creating a phenomenological zone around the area. Through this type of spatial configuration, multiple user needs can be accommodated. The space is capable of handling multiple situations; a large space could become small without ever having to shift components around.

There are a variety of forms of dynamic flexibility found in buildings and design today that address problems of space limitations and programmatic needs. Dynamic flexibility can best be described in terms of gerunds or action words which both describe their actions and identify the subject of how flexibility is being addressed. Among some of the examples of gerunds that describe dynamic flexibility are; sliding, rotating, shifting, collapsing, plug-in, stacking, opening, folding, joining, slipping, profiling, scaling, packing, blending and weaving. This list serves as an example of movements or actions that can be implemented into design to deal with transformation and reconfiguration of space. By implementing these animated actions into a design, the user is also encouraged to become involved in the process of creating their own environment. This allows
users to take a more active role in developing the environment.

To most effectively design a space that accommodates change and fluctuation, a combination of both static and dynamic strategies should be implemented. Through using both of these methods, designers can effectively create space that uses both techniques in junction with each other. Through coordinated multiple readings of space, operable building components can easily allow a user to define the space as they deem necessary. It gives the user the ability to turn the phenomenally transparent qualities of the space into a defined reality.

Transformation of space will certainly occur within the design of the recording studio, therefore a unique opportunity is created in which a transformed space can affect its surrounding area. When one space moves, another element will be impeded upon. This creates the chance for the static reading of space be designed in more than one instance. Because the project utilizes a less restricted interstitial space, the movement of areas and space within it should not be done arbitrarily but orchestrated to allow the quality of the interstitial space to be enriched by its movement.
The Charles Wyly Theater in Dallas Texas, designed by REX Architects, is a new project that is pushing the boundaries in regards to universal space and flexible design. The design involved the need for various types of stage layouts, which are typically addressed by building multiple stages. This was not an option due to financial and spatial constraints; therefore REX developed a strategy for designing a single space to accommodate multiple stage configurations. (Image 51b) The concept was to put the front and back of house on the bottom and top of the theater space. This allows the space to open up and be free to the city around it. By placing the back of house above the theater space, program pieces such as seats, balconies, and stage configurations can be flown in from above and re-configured in a number of different ways. By creating this void space above, all of the needs for multiple programs can be situated within one space giving the space freedom and flexibility (Image 51d).

This project serves as an appropriate precedent because of its ability to incorporate many of the previously discussed issues that deal with flexibility. Issues of specific flexibility, fashion, program, maintenance, universal space, High/Low road, and Cyclical methods all come together in this piece to create a flexible project. This project was able to push the concept of a universal space further than the Pompidou Centre because of its ability to have transformable elements readily at hand in the fly bridge. The universal space also had some level of specificity which helped direct how the space was to be transformed; it created a system that worked well when acting like some type of theatre but was also robust enough to easily
incorporate other activities.

In the design of the Wyly Center, affordable and non-precious materials were also purposefully used in areas of heavy transformation to eliminate hesitation to alter the space or build upon it. According to their design intent “Pristine elements can be flown; the remaining environment can be cut, drilled, painted, welded, sawed, nailed, glued, and stitched at limited costs” which closely resembles the High and Low road concepts of Brand. By incorporating the appearance of flexibility in the aesthetic look of a building, the fashion of the space can demonstrate to users how to understand the use of space. The issues of maintenance also dealt with these readily changeable components that could allow for quick upgrades to the space. Also the separation and grouping of mechanical and circulation space avoided the burden of changing out service elements when altering a programmed space. Because this project has not actually been finished, the actual connections and methods for ‘flying’ elements into the space cannot be properly critiqued or studied. Concepts of modular connections and bolt and pin connections, along with lifts and crane elements incorporated into the design can allow for the quick and easy swap of elements.

The ultimate success of this design can be found in its ability to incorporate multiple designed functions within a singular space while still accounting for other potential uses to be discovered in the future. Concepts borrowed from this project will serve as a basis on which to build upon in the design of the multi-programmed recording studio space.
In a similar approach to the Wyly Theater, the Suitcase House by Gary Chang offers a performance/void type space. The long open space contains the central portion of the design that is occupiable with a void and service space located below to support the main space.\textsuperscript{15} The success of the space is the interaction between open space and void spaces which can hinge open into multiple configurations. This feature allows the user to transform and dissect the space as they see fit.

In regards to flexibility, this project has some great moments but also some problematic faults. The design does a good job of letting the user define how the space is to be used through its operable floors and walls and allows them to interact with their house based on the appropriateness of the situation, whether that is dining, sleeping, entertaining, or relaxing. The interaction, is however, very limited in the sense that the uses are very specific and not intended to be changed. Once the floor is opened up, the use inside always remains the same making the design a glorified static building that simply conceals its spaces. It doesn’t allow the user the potential to rethink the way space is conceived. If the containment rooms could be re-configured or added to, the house could then allow for unanticipated program to be accounted for; or existing adjacencies to be reconsidered.

By using concepts similar to this within the interstitial space of the music recording studio, ‘hot spots’ can be created to allow artists to quickly manipulate the space into a writing, performing, or impromptu jam secession space. The instances could then be varied throughout the building and interchangeable to allow different configurations and systems to be moved and introduced throughout the building.
The site is located in Cincinnati Ohio, in Over the Rhine. The site was selected because of its adjacency to other artistic venues located along, and around Main Street, such as art galleries, artists studios and the multi-media facility directly adjacent, Lighboun Studios. This creative environment provides an appropriate setting for cultivating creative aspirations and encouraging collaboration among mixed media artists. The surrounding parks (Cutter, and Ziegler) provide an opportunity to allow the design to open up to the surrounding areas during the summer months for outdoor concerts.
Program is arranged and "mixed" to promote the intermingling of different user types. Recording studio spaces are located towards the north west end towards the mechanical and vertical circulation spaces to allow most views and sunlight to reach the writing and interstitial spaces.

Floors are layered in between the programmatic spaces to create unique niches and environments within the interstitial space. The Performance space is located on the south end to open up and engage with the adjacent park.

Major vertical circulation and mechanical space is one of the least flexible components of the buildings and is therefore placed on the north west end of the site to leave the east and south ends of the building open and unobstructed to allow for easier transformation of space.

The spaces in between all of the more highly scripted spaces becomes the interstitial, which is to be used and interacted with by users as an extension of their writing and recording spaces. It provides a means for collisions and collaboration of ideas to occur within the building.
A large structural truss is placed around the exterior of the two major volumes (writing/recording and performing). This allows the floor plates within to be more open and expansive which leads to increased flexibility in the design.

Spaces are built in within the interior in both low road and high road methods, depending on the space. Recording studios will be changed less frequently therefore using high road methods while writing spaces will change more frequently needing low road techniques.

Operable components are placed in strategic locations throughout the building to allow for transformations to be easily made. One problem in the past with flexibility in buildings is the fact that changes require too much work. Storage of materials and manipulation of space must be readily available, if the space is to be successful.

An operable louver and mullion system is then placed on the exterior of the building to allow users to control and manipulate their level of interaction with the external environment.
With the collection of all these spaces arranged within the skin of the building, program types begin to push and pull on each other at different intervals of time, creating a flexible interstitial space for artists to operate in throughout their different phases of work.
The basic elements of the recording studio consist of a mixing room, a main chamber, and walls that have a high degree of acoustic separation from outside noises.

To accommodate change while still maintaining acoustic control, 3 of the outside walls are fixed while the east wall is operable, allowing unused space to be given back to the interstitial.

If there was no use for one of the recording studios for an extended period of time, all of the elements of the space can be collapsed to minimize its footprint.

The operable wall is moved into place according to the bands projected size and spatial needs. Changes to the overall space will be made only a new band or artist moves into space.

An operable wall infrastructure is placed along the perimeter to allow different materials and surfaces treatments to be grafted onto the wall in a Low Road fashion.

Ceiling panels and partitions can be flown in from above the space to create different levels of sound reflection and reverberation.

The operable wall system can also allow for ‘pockets’ of space to develop within the studio space for different instruments or types of recording.

The operable wall is a lighter construction, allowing it to move. The wall is then separated into different layers which can be pulled away individually creating different environments for multitrack recording within the studio space.

The recording areas are the most controlled spaces within the building. Technical requirements for size and acoustic separations are high, therefore most responsibility is placed in the hands of the architect and management, as they have the most knowledge and mastery of those elements. Because the space is programmatically fixed there is little interpretation for other uses of the space. It is appropriate to use more High Road in this scenario because the use of the space in the future is relatively predictable making it worth while to invest in. Change over time for this type of space must relate primarily to issues of recording spaces such as new materials, recording techniques, and technology changes. The focus of change was placed in creating a robust system that can support the acoustic tuning of the space, different spatial configurations, for band arrangements, and new and varied recording styles.
The interstitial space is the most readily changeable component of the building. Its elements allow for quick and easy changes that require relatively low levels of labor to transform the space. Within the interstitial space there are three major activities that occur: writing, teaching, and collaborating. The writing and teaching spaces will require a slightly more significant transformation of space, while other quick ‘hot spots’ are located sporadically throughout the interstitial space to promote impromptu performances, jam sessions and collaborations.
The skin of the building is able to open up to external factors through multiple layers. Internal shading systems allow the users to block out direct sunlight. Operable louvers on the exterior allow for various levels of diffused or direct light into the space to create the right mood or feel of the space for writing. Large operable windows can also allow the building to open up directly to the exterior to either let sounds into the space, or let the sounds of the musicians out to the public.

HOT SPOTS
The ‘hot spots’ throughout the interstitial space allow for quick and easy transformation of space. This concept is derived from Gary Chang’s Suitcase House by allowing pockets within the space to accommodate different program elements. To build on this idea, a typical module is applied to establish a language, allowing the areas to be swapped out if they become obsolete, unwanted or if another more appropriate strategy is found later. This type of space is meant to work in a very Low Road fashion.
In order for one space to accommodate such a variety of musical groups and audience sizes, focus must be placed on creating a system robust enough to adapt to each situation effectively. The performance space is essentially a mix between the concepts of the recording spaces and the interstitial. It requires a certain level of performance but also has a high degree of user interaction and manipulation. A balance must be reached between the two in order to fulfill both requirements. To do this, both High Road and Low Road methods must be implemented to create a successful space. To facilitate these types of changes, the management of the building will have the greatest understanding of how to use the space. They will have the knowledge of how the space has behaved in the past and through the input from cycling musicians, new and unexplored potentials can also be found.
To create a performance space that is able to accommodate the needs of all these user types, a simple lift system was implemented to allow certain tasks of house operations to occur underneath the actual performance space. The adjustable floor heights also allow the space to conform to many different shapes and sizes.
We are convinced by things that show internal complexity, that show the traces of an interesting evolution. Those signs tell us that we might be rewarded if we accord it our trust. An important aspect of design is the degree to which the object involves you in its own completion. Some work invites you into itself by not offering a finished, glossy, one-reading-only surface. This is what makes old buildings interesting to me. I think that humans have a taste for things that not only show that they have been through a process of evolution, but which also show they are still part of one. They are not dead yet.

-Brian Eno - In Stewart Brand’s How buildings Learn

The study of the music recording process served as an excellent venue in which to explore amenability within buildings. It allowed three things to happen; it provided a clear and diverse user group that required the need for flexibility in different ways, significant constraints were placed on the design forcing the building to react to different scales of change, and the users involved were a part of a creative group and would be likely to exploit the potential of the space to its maximum.

The fact that within the music process, elements such as recording techniques, music styles and taste, and technologies are changing at different rates, allows the building to react in different ways to criteria that may not always be immediate. This idea of amenability in architecture is something that should certainly be considered in other building types to help maintain a buildings use and productivity over time.

In looking at buildings with this Long View attitude, it is evident that design can become more wholesome if considerations are made not only for the day the building is opened, but also for 10, 25, or even 50 years down the road. Once the construction of a building is finished, it is not done; it's life has just begun.
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