MR theory application as an influence on interior design decision making: EE Warren Opera House, Greenfield, Iowa: a case study

Tina Patel

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MR theory application as an influence on interior design decision making:
EE Warren Opera House, Greenfield, Iowa - A case study

by

Tina Patel

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

Major: Art and Design (Interior Design)

Program of Study Committee:
Çiğdem T. Akkurt, Major Professor
Fred Malven
Jihye Park

Iowa State University
Ames, Iowa
2005

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This is to certify that the master’s thesis of

Tina Patel

has met the thesis requirements of Iowa State University

Signatures have been redacted for privacy
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ABSTRACT

Retail environments are closed environments that exert a significant impact on consumers affect, cognitive and emotional behavior. Store atmospherics or design factors is considered one of the most prominent retail environmental stimuli which influences people to enter, remain in and utilize the environments. Numerous studies and researches support this notion; however these studies provide neither a framework nor a methodology to determine what design factors or atmospherics influence this decision.

The purpose of this thesis is to propose a framework that can explain the relationship between the ‘atmospherics’ and the consumer’s emotional responses. This framework is developed from the Mehrabian and Russell theory and the design theories by Kevin Lynch and Roberto Rengel. Grounded Theory Approach is adopted to critically analysis the existing theories which are further integrated for this new interpretation.

The proposed framework is then applied as a case study in an actual design process for the retail – mixed use space of E E Warren Opera House, located in Greenfield, Iowa. The design analysis and design development are conducted on the basis of the proposed framework. To understand the application of the framework better the redesigned space was exhibited to the committee members of the E E Warren Opera House and a questionnaire was given to them to learn about their emotional reaction to space. The proposed design based on the framework was successful in inducing positive emotional reaction among patrons which would further increase the business both for local customers and destination visitors from outside and within Greenfield. This also reveals the potential use of the framework for such a design application.
CHAPTER 1. INTRODUCTION

“Companies stage an experience when they engage customers in a memorable way”
(Pine and Gilmore, 1999, pg. 3)

Problem Statement

A visit to the Mall of America, retail stores and malls located on the North Michigan Avenue in Chicago, Rain Forest Cafe or ESPN Zone are frequently on the to do list when people travel to the places where these buildings are located (Figure 1-1, 1-2, 1-3 & 1-4 exhibit these places). Why do people prefer to visit these places, why do people prefer shopping at Target than Wal-Mart or malls than the strip malls? These are some of the common questions retailers, marketers, psychologists and store designers delve into time and again. In academic and empirical research, several factors have been shown to affect the store preference decision. To list a few: locations of the stores, store image, sales personnel attitude, merchandise quality, sales and promotions of the store (Craig, Ghosh & Mc Lafferty, 1984; Morey, 1980; Schary & Christopher, 1979).

Figure 1-1: Mall of America  
Figure 1-2: Rainforest Cafe
Joyce & Lambert (1996) in their research found that the store environment is considered one of the prominent factors influencing people to enter, remain in, and utilize environments. Store environment, becomes a fertile opportunity for market differentiation. Considering this, the retailers today are investing millions of dollars designing, refurbishing and building their stores. For instance, Neiman Marcus will spend more than $200 millions within 5 years to renovate its 23 stores (Lawson, 1996). In an era of increasing competition, retailers must be certain that their stores are up-to-date and portray an image that is appealing to their target markets (Baker, Levy & Grewal, 1992). This is more because retail stores are relatively closed environments that exert a significant impact on consumer’s affect, cognitive and emotional behavior (Peter & Olson, 1999). Furthermore, shopping experience is becoming more important in a store environment due to the expansion of convenient dot com businesses, commoditizing product and services.

There was a time when retail environments had few standards to meet. A store would be clean and organized to maximize sales per square foot. But today in an era of increasing competition, the retailers must portray an image which is appealing to their consumers. A retail environment must also directly tie to the merchandise it is selling and speak of its value.
proposition (Baker, Parasurman, Grewal & Voss, 2002). This thesis starts with the basic question – *What are the design factors in a retail setting which influences the positive shopping experience in a store?*

The influence of the various factors in an environment which influences human behavior has long been acknowledged by landscape architects, architects and interior designers and also by far-sighted retailers. However, the areas which have gained importance are work environments, residential environments, entertainment environments and institutional environments. Retail store environment, an important aspect of our culture has gained little or no importance (Donovan & Rossiter, 1982). Kotler (1973) introduced the term ‘*store atmospherics*’. Following that, a few research done by: Stance & Sewell (1976) and Malhotra (1983), in this area supports the notion that *store atmospherics* is an important aspect of store image and does influence the store choice decision and store patronage. However, these studies provide neither a framework nor methodology to determine design factors which influences this decision. The challenge for the designer is to invent new kinds of retail environments which are both efficient (in terms of space and flexibility and cost) and effective (communicating brand values, concepts and encouraging consumer activity) to meet customer demands (Rashid Din 2000). One might expect that there are several guidelines apart from effective use of space or changing trends in visual merchandising fixtures. Thus, it has become important for planners and designers to have a sharp perspective on top management thinking and be aware of environmental characteristics affecting consumer behavior. To do so a general framework is necessary to guide the designers to create memorable spaces and predict consumer’s attitude, emotional response and their behavior outcomes in these environments.
This academic research forms a bridge between interior design and other areas closely related to retailing such as marketing and consumer psychology. It makes an attempt to understand theoretical frameworks and empirical research already existing in the area of marketing retail and environmental psychology (concentrating on consumer behavior in retail setting) and relates it to interior design theories. Thus, such a guideline would help expanding the existing body of literature.

The second stage of this thesis is to take the framework which would be developed and redesign retail-mixed use space for EE Warren Opera House, in Greenfield, a small town located in southwestern part of Iowa. An in-depth interview will be conducted with the natives and people actively involved in resuscitating the Opera House to develop an understanding about the visions, objectives and history of the building. This along with the developed framework would form the basis for the author to design the retail-mixed use space for the EE Warren Opera House. The outcome of the expected design would be to induce emotional reaction (pleasure and arousal), which would affect patron’s behavior (amount of time and money spent, browsing intention, intention to return etc.) towards the space.
Theoretical Background

"The shopping environment is commonly known as the place or space where people buy goods and, in a broader sense it includes intangible products and services" (Barr & Boudy, 1986).

Retailer’s aim is to create a new stage where consumers enter, and respond to new trends in consumer behavior and define parameters of new urban style (Otto Ritweild, 2002). Interestingly, the physical environment itself is a primary product in a store setting which affects the consumer behavior or purchasing patterns. Kotler (1974) coined the term ‘atmospherics’ to describe the intentional control and manipulation of environmental cues to create an impact on consumer’s attitude and emotions. Sharma and Stafford (2000) found that, in prestigious store environments, store atmospherics are used as the primary evaluative attribute by consumers. Store ambience and design positively affect customer persuasion as well as customer’s positive perception of the sales person. Turley and Milliman (1976) did a comprehensive review of literature and the most impressive result was that each of the 60 studies they reviewed found some significant relation between atmospherics manipulations and shopping behavior indicating that consumers respond to stimuli found in these store interior environments. Kotler (1974), claims that atmospherics should be utilized to describe the conscious designing of space to create certain affects on the buyers.

The most common theoretical model adopted in retail business researches to study the consumer behavior affected by physical environment is the Mehrabian- Russell Theory commonly known as MR theory. This model demonstrates the framework that can explain and predict emotional responses of people in the environmental setting. Figure 1-5 explains this relationship.
Environmental Stimuli $\rightarrow$ Emotional Response $\rightarrow$ Behavior Outcomes

(Pleasure, Arousal & Dominance) (Approach & Avoidance)

Figure 1-5: M-R Theory

The studies conducted based on this model accounted for very few stimuli at a time with little realistic availability (Eroblu & Machleit, 1993). Thus, it becomes valuable to research environmental factors affecting consumer behavior on the basis of MR theory holistically and applies it to the retail design process. Such a re-adaptive use of this theory would help explaining the relationship between the stimulus and organism and would draw researcher’s attention to store design. This thesis is based on the following assumptions:

- MR Theory is promising for research on environmental stimuli and consumer behavior
- The theory can be further expanded by integrating it with interior design theoretical models and can form a guideline for designers as well as the retailers.
**Purpose Statement**

The purpose of this study is as follows:

- To integrate the theories and empirical findings from the marketing literature based on MR theory with Interior Design theories. The proposed framework responding these theories and research would help create a retail setting which would have a positive influence in patrons' internal state and behavior.

- To analyze an existing retail mixed use environment, E.E. Warren Opera House, located in Greenfield, Iowa as a case study based on the proposed framework.

- To create a unified and aesthetically pleasing retail-mixed space for E.E. Warren Opera House, using the suggested framework. Expected outcome of the proposal is to induce emotional reaction among patrons which help increase the business both for local customers and destination visitors within and outside Greenfield.
Organization of the Document

This thesis is divided into six chapters. The first chapter focuses on introduction, theoretical background and helps define the purpose of the thesis.

Second chapter addresses literature review which as four parts. First part talks about the experience in shopping environment, second part focuses on the MR model, third part on the set of empirical research done in marketing and business literature based on MR model, fourth part integrates all these research model and the final section talks about the interior design theories focusing on the functional layout and spatial qualities.

Third chapter delves into research methodology. Chapter 4, talks about the analysis and synthesis of the above theories and the questionnaire. Chapter 5 focuses on the case study. It is divided into four parts. First part talks about the project, second part about the design analysis based on the theoretical model and third about the design development. The final part talks about the result of the case study and the survey which was conducted to learn about the emotional response to the design. Chapter 6 talks about the conclusions and implication.
CHAPTER 2: LITERATURE REVIEW

This chapter focuses on the environmental-perception relationships in a physical shopping environment and is organized into four parts: the first part focuses on the experiences one encounters in the retail environment; the second part explores the Mehrabian and Russell model on the relationship between store atmospherics and emotional experience. The third part concentrates on the empirical researches done in marketing based on the Mehrabian and Russell theory and in the end; an attempt is made to derive an interrelation between these researches. The fourth part talks about the interior design theories on ‘design factor’, one of the most important categories of environmental stimuli according to the MR theory.

Most of the academic research on the relationship between store atmospherics and emotional experience is conducted in the marketing area. These researches, however, fail to give a comprehensive view of the design factors (one of the important components of the environmental stimuli) in a physical retail setting which influence the consumer’s experience. This thesis is an attempt to bridge this gap by relating it to the interior design theories. The author found that there is a lack of empirical research in interior design in this area. This study is exploratory in nature, so for the purpose of this thesis, the author will concentrate on the theories by Kevin Lynch (1960) in his book ‘Images of the City’ and Roberto J. Rengel (2003) in his book ‘Shaping Interior Space’.
Part I: Experience in a Shopping Environment

“Shops and shopping satisfy needs at different times whether it is a rushed lunch hour trip for essentials, a Friday night family shop to stock up boards for the following week or a leisurely weekend stroll for less important purchase. Shopping fulfills a wide spectrum.”

(Rashid Din, 2000).

Lethonen & Maenpa (1997) found in their research that shopping has two values from consumer’s viewpoint. First is the hedonic, or pleasure value and second is the utilitarian value. Table 2-1 explains the values of these two consumers. A similar concept is shared among other researchers such as: Baker (1992), Wakefield and Baker (1998). Thus consumers, besides satisfying the utilitarian aspect, also search for some kind of experience in these stores.

Table 2-1: Shopping Pleasure versus Necessity (Lithonen & Maenpa, 1997)

<table>
<thead>
<tr>
<th>Shopping as a pleasurable social form</th>
<th>Shopping as necessary maintenance activity</th>
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<tr>
<td>1. Spending time</td>
<td>Scarcity of time</td>
</tr>
<tr>
<td>2. An end in itself</td>
<td>A mean to an end</td>
</tr>
<tr>
<td>3. Doesn’t imply purchase</td>
<td>Always imply purchase</td>
</tr>
<tr>
<td>4. Impulsive</td>
<td>Planned</td>
</tr>
<tr>
<td>5. Dreaminess &amp; self illusory</td>
<td>Realistic satisfaction of needs</td>
</tr>
<tr>
<td>hedonism</td>
<td></td>
</tr>
<tr>
<td>6. Effectiveness unimportant</td>
<td>As effective as possible</td>
</tr>
<tr>
<td>7. Pleasure</td>
<td>Necessity</td>
</tr>
<tr>
<td>8. Outside the routine of everyday</td>
<td>An everyday routine</td>
</tr>
<tr>
<td>9. Emphasizes on experience</td>
<td>Emphasizes on rationality</td>
</tr>
<tr>
<td>10. Playfulness</td>
<td>Seriousness</td>
</tr>
</tbody>
</table>

Pine & Gilmore (1999), also emphasize the importance of experience in business fields in their book ‘The Experience Economy’. They state that experience is the fourth
economical offering, as distinct from services as services are from goods, but it is unrecognized. When a person purchase services, he purchases a set of intangible activities carried out on his behalf. But when he buys an experience, he pays to spend time enjoying a series of memorable events that a company stages, as in a theatrical play that engage him in a personal way.

Shopping has always been a personal and highly social activity. It is a communal activity about people coming together in market malls, streets and shops. Thus, by walking into one of them, they do not just buy products, but the ethics of the company (Otto Rietweld, 2002). Therefore, a shop is a place where one can experience and understand the spirit of the company besides consumption. The aim here is to create a new stage where customers can enter, act, and response to new trends in consumer behavior and define parameters of new urban style.

Currimbhoy (2000) notes, “Disney, Nike, FAO Schwarz and Universal Studios, among others are offering a variety of experience, enriching activities in their mega stores. Malls and even small stores offer movies, games, light, sound and fashion shows and other interactive amusements. Cosmetic stores have become minispas, some health food shops include herb gardens and walks across a mall become a passage to India.”

In other research Kotler (1974) claims that physical environment itself is a primary product in a store setting, indeed, a positive spatial experience should be enhanced in a retail environment whether or not it sells goods and services.
Part II: Relationship between Store Atmospherics and Emotional State

"Shopping environments are fun places, like fairs or bazaars, citing shopping environments as sources of excitement and pleasure”

(Mehrabian, 1976).

The Mehrabian and Russell theory, known as the MR Theory explains, the immediate emotional state elicited by the environmental stimuli and its influence on the human behavior. According to this model, the three basic combination of emotional dimension-pleasure, arousal and dominance (PAD) represent emotional state (Mehrabian 1976, 1980; Mehrabian & Russell, 1974), and are the mediators of human behavior. Several marketing studies have explored the effects of store environment on consumer’s emotional state based on this theory. Figure 2-1 explains this paradigm.

<table>
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<th>Primary Emotional Response</th>
<th>Behavioral Response</th>
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<tr>
<td>Sense modality Variables</td>
<td>Pleasure</td>
<td>Approach</td>
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<td>(example: color &amp; temperature)</td>
<td>Arousal</td>
<td>Avoidance</td>
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<tr>
<td>characterizing the spatial &amp; temporal relationships among the stimulus components of an environment</td>
<td>Dominance</td>
<td></td>
</tr>
</tbody>
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Figure 2-1: MR Theory

People’s reactions to environment are based on just a few emotional dimensions, which in turn can produce many different behaviors. The basic chain of events consists of a given environment experienced by a person, the person’s processing of the emotions presented by the place and situation, and the person’s behavioral reaction, avoiding or approaching the space. The three terms – environmental stimuli, emotional response and behavior response discussed in this model are further elaborated.
**Environmental Stimuli or Atmospherics:**

Mehrabian and Russell (1974) in their theory explained environmental stimuli as the sense modality variable characterizing the spatial and temporal relation among stimulus component of environment. To understand these variables more, the author delves into various researches done on this subject in the marketing area. One of the interesting studies was done by Kotler. Kotler (1974), coined the term ‘*atmospherics*’ to describe the intentional control and manipulation of environmental cues. The accumulated studies of the retail environment pertaining to atmospherics can be best described as being both eclectic and diverse. Turley and Milliman (1976) did a comprehensive review of this literature. The most impressive results was that each of the sixty studies they reviewed found some significant relation between ‘*atmospherics*’ manipulation and shopping behavior, indicating that consumers do respond to stimuli found in these environments.

Kotler claims that ‘*atmospherics*’ should be utilized to describe the conscious designing of space to create certain effects in buyers. More specifically, atmospherics is the effort to design buying environments to produce specific emotional effects in the buyers that enhance his purchase probability (Kotler, 1974). According to Kotler, atmospherics affect the purchase behavior in three ways. Figure 2-2 explains this relationship.

![Figure 2-2: Kotler's Theory](image)

- **Message Creating Medium**: expression of vendors to establish their images and goals to potential and actual consumers
- **Attention Creating Medium**: establish capturing consumer's attention among other competitors
- **Affect Creation Medium**: establishment of consumers positive emotional reaction contributing to purchase possibilities
The use of atmospherics to create an environment stimuli and its influence on behavior of individuals is seen in various researches. Spies (1997) studied the effect of store atmosphere on moods and purchasing behavior by comparing two furniture stores. Results show that the store atmosphere directly affects customers’ mood, and enhanced mood affects their spending habits. Atmosphere also effected satisfaction, which was greater in the pleasant store than in the less pleasant store. Figure 2-3 explains the results of their study.

![Figure 2-3: Relationship between Store Atmosphere and Consumer Behavior (Spies, 1997)](image)

The study of the relationships between environmental stimuli and human reaction affecting consumer behavior was conducted by Bitner (1992). Figure 2-4 explains the relationship. The study suggests that environmental factors not only affect consumers, but also affect the employees. Respondents in this framework perceive environmental stimuli holistically by establishing three environmental dimensions: 1. ambient condition: 2. spatial
layout; and 3. signs, symbols and artifacts. Ambient factors in this framework refer to background characteristics of the environment such as lighting, music, noise, odor and temperature. These factors are generally unnoticeable when subjects are exposed for a long period in the environment. Spatial layout in this framework is defined as ‘the ways in which machinery, equipment and furnishings are arranged, the size and shape of those items and the spatial relationship among them. Functionality refers to the ability of the same items to facilitate performance and accomplishments of goals’ (Bitner, 1999). Signs are defined as direct signals of communication, such as labels of company names or departments, directional signage, and labels of behavior rules. Symbols and artifacts are implicit cues to users about the meaning of places, norms and expectations for behavior in the place.

Bitner indicates that the three environmental dimensions elicit internal responses in both consumers and employees in three different ways: cognitive, emotional and physiological. This framework also hypothesized that the perceived servicescapes affect people in purely physiological ways. The responses, according to this framework, are strongly associated with feeling of comfort elicited by the environment. According to this hypothesis, physiological responses may influence seemingly unrelated beliefs and feelings both of the place and the people there (Bitner, 1992).
Figure 2-4: Bitner’s Framework for Relationship between Store Environment and Users (Bitner, 1992, pg60.)
Further research conducted by Baker (1992) categorizes environmental stimuli as ambient, social and design factors.

**Ambient Factors**

Ambient factors in business literature are considered those unconsciously perceived environmental factors such as temperature, scent, noise, music and lighting (Baker 1992; Baker & Parasuraman, 1994; Wakefield & Baker, 1998). These factors are positively related to pleasure. If accepted ranges of these factors are exceeded, consumers are aroused and sometime might become displeased. For the purpose of this thesis, ambient factors are taken as stated in the business literature: temperature, odor, music and light.

**Social Factors**

Social factors are the behavior of the sales personnel and the other customers in the retail setting. It influences consumers’ perception of the store image and are interrelated with ambient factors in determining the quality of merchandise and services as well. This factor is not taken into account in this thesis.

**Design factors**

According to Baker and Parasurman, design factors are more related to the visual elements. Functional layout and aesthetic elements are considered two categories of design factors. Design factors are hypothesized as strong indicators eliciting approach behaviors such as excitement, exploration and desire to stay; all induced by the emotional state is supported by Wakefield and Baker (1998).

Tai and Fung (1997) distinguished two main streams of research that have emerged within the body of literature on atmospherics in service settings. One stream treats the service atmosphere as a holistic concept, focusing on the combined effects of elements of
the environment on consumer behavior (McGoldrick & Peros, 1995; Donovan et. al., 1994). Another stream focuses on specific atmospheric elements such as: color (Bellizzi et al., 1983), lighting (Areni & Kim, 1994), scent (Gulas & Bloch, 1995), and music (Yalch & Spangenberg, 1990; 1993; Milliman, 1982; 1986).

In this study, the author will concentrate on design and ambient factors as a holistic concept in the retail-mixed use setting. The design factors in business are not categorized comprehensively in the above mentioned business literature, thus for the purpose of this thesis, the design theories by Roberto J. Rengel and Kevin Lynch will be taken into account, which will be discussed in-depth in the last part of this chapter.

**Emotional Responses:**

According to Mehrabian and Russell (1974), the three emotional responses generated due to the environmental stimuli or the ‘atmospherics’ which further mediate approach/avoidance in any environment are pleasure, arousal and dominance. They further explain that all the immediate responses of stimulation in all environments can be identified by pleasure, arousal and dominance. Secondly, these three dimensions can explain various aspects of personalities and social differences. Finally, these emotional states can not only contribute to the base for elementary cognitive judgments in all situations, but have direct bearing on many other facets of intra and inter individual feelings (Mehrabian, 1980).

**Pleasure**

Pleasure is a measure of how much we like an environment. It can be defined as the degree of feeling such as good, happy, joyful, or satisfied in a situation (Baker et al. 1992; Donovan & Rossiter, 1982; Mehrabian and Russell, 1974). In the MR theory, the determination of pleasure is assessed by testing verbal expression of the subjects’ emotional
states; the pair of adjectives referring to pleasure is: happy-unhappy, pleased-annoyed, satisfied-unsatisfied, contented-melancholic, hopeful-despairing and relaxed-bored (as per the PAD scale by Mehrabian and Russell, 1974).

**Arousal**

Arousal refers to the overall level of stimulation experienced by the individual due to stimuli. Atmospheric dimensions affecting arousal are associated with sense modality. According to Mehrabian and Russell (1974), arousal is understood as the feeling state that subjects experience and the degree to which these subjects are aware of the environment stimuli. It can be achieved by the combination of low task and high information rate or by combination of high task and low information rate that the environment offers. These qualities of an environment may excite consumers and might increase their blood pressure and heart rate (Mehrabian and Russell, 1974). The information rate depends on complexity, novelty, variety of elements in a scene, and surprise or randomness of the external stimuli (as per PAD scale by Mehrabian and Russell, 1974).

**Dominance**

Dominance is the degree of control and freedom to act that we perceive in a setting (Wapner, Cohen & Kaplan, 1976). According to MR theory flexibility, privacy and territoriality can affect the feeling of dominance. For instance, flexible arrangement of furniture or lighting, reading a book in one’s own room rather than in a library or well-facilitated tools in one’s workspace can enhance the feeling of dominance (Mehrabian & Russell, 1974).

Donovan and Rossiter (1982) argue that the emotional state of dominance should be excluded in MR theory for store environments. The reasons are: first, the measurement of
dominance is ambiguous in the retail settings; and second, dominant feeling might already be achieved when consumer enters the store because of the nature of store environments. Therefore, in general pleasure and arousal are more adequate dimensions of emotional responses of people in most retail environments. Donovan and Rossiter found a slight negative relationship between dominance and money spent. “The negative sign indicates that a feeling of submissiveness may accompany the anticipation of spending more money than intended” (Donovan & Rossiter, 1982, pg 51).

For the purpose of this thesis, the two emotional responses taken into consideration for the retail setting are pleasure and arousal.

**Behavioral Responses**

Approach/avoidance behavior is defined in a broad sense including physical movement towards or away from an environment or stimulus, degree of attention, exploration, and favorable attitudes (Mehrabian & Russell, 1974). Several responses in a retail environment that represent approach or avoidance behavior are: number of items purchased, amount of time spent in the store, money spent, browsing intentions, willingness to come back to the store, and recommend the store to a friend (Donovan & Rossiter, 1982; Sherman & Smith, 1986).
Part III: Previous researches using the MR model

Few marketing researches mentioned in Part II of the literature review helped to elaborate the terms used in the MR theory. Several researches were conducted explaining the relations of the three terms in the marketing and business literature. This part focuses on those researches.

Donovan and Rossiter (1982) found support for the MR theory in a retailing context by investigating the relationship between emotional states induced by eleven different store environments. They found that stores that induced pleasure were positively associated with willingness to buy. Stores that induced arousal influenced the time spent in the store and willingness to interact with the sales personnel. A crowded service environment reduced consumer’s pleasure (Hui and Bateson, 1991). Yalch and Spangenberg (1990) found that different types of music in a store setting created different emotional responses in the consumers. Similarly, subjects in an experimental study reacted emotionally to warm and cool colored walls (Bellizzi, 1983). Besides studies in traditional store setting, Eroblu (2001) tested their model online atmospherics based on MR structure. He found that increasing the atmospheric qualities of the online store website increased the shopper’s level of pleasure. This effect is moderated by the consumer’s involvement and atmospheric responsiveness. In addition, the effect of the site atmospherics on the attitude, satisfaction and approach / avoidance behavior is the result of the emotions experienced by the shoppers.

The studies by Baker et al. (1992) where environmental stimuli is classified as ambient, social and design factors were important in determining the pleasure and arousal in the retail setting. The significant result of the research was that ambient and social conditions
and also the functional layout were strong factors that induced a feeling of pleasure in the store, which influenced them to browse the store more. Figure 2-5 explains the relationship between marketing theories and MR model so far.

**Figure: 2-5 Environmental Dimensions and Effects from the Business Literature**
Part IV: Categorization of Design Factors from Interior Design Theories

Design factors in the marketing literature are categorized as functional elements and spatial qualities. This part focuses on classifying them on the basis of interior design literature.

Functional Layout

Functional elements include; layout, comfort and privacy and aesthetic elements include factors which enrich the space like architecture elements, color, material and style (Baker and Parasuraman, 1994). In interior design, functional layout is conceptualized as more than just store planning in retail design. It reflects every aspect of human activities or behavior in the space. It reflects emotional, cognitive, ecological and functional aspects as well as merchandise and service quality (Ketchum, 1957).

Function as discussed in the environmental design discipline refers to the things people are supposed to do within a specific environment. These translate to specific arrangements of spaces, furnishings and equipment, and particular placement of the people within the spaces (Rengel, 2003). Pine and Gilmore (2000), compared this analogy with theatre; function involves the actors (users) using the props (furnishings and equipment) to perform certain roles. In theatre this occurs on a stage. It is important to understand the generic type of spaces that occur in interior project, thus, it will give one a complete picture to layout an interior space.

According to Rengel (2003) the interior environment can be reduced to destinations and places which help us reach them, are circulation systems. He further adds that the spatial characteristics of these two types of places are defined by boundaries around and objects within these places (Rengel, 2003). These four categories: destinations space, circulation
system, boundaries and objects are comparable to Kevin Lynch’s (1960) studies which reveal that people make sense of urban surroundings by making mental maps that feature five elements: districts, paths, nodes, edges and landmarks. These aspects or features are discussed in detail.

**Destination Places**

Destination places as explained by Rengel are defined as districts by Kevin Lynch. Lynch (1960) describes districts as “medium to large section of the city, conceived as if having two dimensional extents which, the observer mentally enters inside, and which are recognizable as having some common identifiable character.” Figure 2-6 explains this concept.

![Figure 2-6: Mot IV in the City of West Vancouver](http://www.metrotown.info/img-site/foodware-vancouver/Motiv-map-WN-Van8x7c.jpg)

A departmental store Mot IV in the city of West Vancouver is comparable to the district where one wants to go according to Kevin Lynch’s Theory (source: http://www.metrotown.info/img-site/foodware-vancouver/Motiv-map-WN-Van8x7c.jpg).
According to Rengel (2003), this concept of destination places in interior design is comparable to districts despite the scale difference, however the concepts are interchangeable. These are places where people go to in a given facility, be it to work, shop or eat. Figure 2-7(a) and 2-7(b) show some of the destination places in an interior space.

**Figure 2-7(a): A Retail Store**
A destination space where one desire to shop
(source: http://www.materia.it/gallery/1281158690.jpg)

**Figure 2-7(b): Workspace**
A destination place where one goes to work everyday.
(source: http://www.bie1.com/elements.com)

**Circulation Spaces**

Circulation systems govern our movement through the space. Rengel (2003) categorized this system as: arrival space, paths and nodes.

**Arrival Space:** The arrival space serves to make an initial overall impressions on visitors and also serve as a departure point to the rest of the facility (Rengel, 2003). This overall first impression, according to MR theory, can elicit emotional reactions which can govern behavioral approach towards the destination space. The consumer would either want to approach or avoid the space. Thus, arrival is considered as occasions of transition between the inside and outside of the building as well as between consumers and rest of the building. The impact of these transitions and the need to make route decisions produce a greater than
average stress and, therefore, a state of heightened awareness. Figure 2-8 (a & b) give some examples of the arrival spaces.

**Figure 2-8(a) – Formal Reception Area**
Reception area is the arrival space of office facility serving as a transition between outside and what lies beyond within the facility.
(source: [http://www.sypa-architects.com](http://www.sypa-architects.com))

**Figure 2-8(a): Informal Reception Area**
Reception is not formal with seating but has wall, ceiling and floor treatment to define it as a location of above average importance.
(source: [http://www.scbdesign.com](http://www.scbdesign.com))

**Paths:** Paths are the only channels along which the observer customarily or potentially moves (Lynch, 1960). Thus paths are the heart of the circulation systems, which not only transport us through the destination spaces but also act as vantage points from which we perceive the totality of a project, its spaces and their sequences. According to Rengel (2003), paths can be classified as main paths and secondary paths. Main paths are comparable to the avenues in the cities. In interiors main paths are used to define the principal movement system and get us to the most important places. Rengel further adds that main paths not only get us to the places but also provides visual and sensual experience that makes certain impressions on people, especially on visitors and new users. A main path's shape, proportions and degree of openness, level of detail and number of events will
communicate in important ways with users and visitors. They can again generate emotional responses which invite them either to browse the place more to retreat. Figure 2-9 (a & b) explains some of the above qualities of the main path.

Secondary Paths: In interiors secondary paths are often narrow and less formal than the main paths, although there is no reason why some of them shouldn’t delight the user. Rengel (2003) says that distinguishing between main and secondary path and designing spaces that physically show the difference between the two will produce clearer, easier to navigate buildings. Figure 2-10(a, b, & c) exhibit some of the examples of the secondary paths.
Nodes: Lynch (1960) explains that nodes are the junctions, like a convergence of paths, or concentrations like enclosed square.

Rengel (2003) adds that nodes are places at given points of the path which are important architectural enhancers. They provide relief, encourage social contacts and accentuate transitions and entrances and create memorable spaces along the way. Thus nodes become a strategy utilized by designers to enhance projects through the creation of spaces for informal human contacts. Figure 2-12 (a &b) show some spaces where nodes are included.
Boundaries:

The most important element related to boundaries is *edges*. According to Lynch (1960) edges are defined as boundaries between places. They can be more or less penetrable barriers, closing off one region from another or seams relating and joining two regions. Rengel (2003) categorized these edges as: solid, mostly solid, mostly open and open.
Depending on their number, size and configuration, barriers can have immense effects on how much of the visual field is disclosed at one time, thus influencing our sense of order and orientation. The shape, placement and arrangement can also serve to communicate the expression of how the building will be. Figure 2-14(a & b) exhibits the transparent and solid edges respectively.

Objects:

The final elements that define the place are the objects. According to Rengel (2003) they can be categorized as furnishings and the landmarks. They play an important role, as their composition and characteristics have significant impact on movement and access.

Furnishings: In the interior design literature furnishings are referred to as: fixtures, furniture pieces and equipment of sufficient size to influence the experience of space. Rengel (2003) adds that the way furnishings are grouped can contribute to the definition of the place. It can contribute to order, enhanced experience and expression (Figure 2-15).
Figure 2-15: Workstations, one of the principal factors that give the space a character.

**Landmarks:** Lynch (1960) defines landmarks as “simply defined physical objects. Their use involves the singling out of one element from a host of possibilities”. Rengel (2003) adds that landmarks give people a point of reference around which to orient and contribute to both experience and sense of expression of a space. They can be visualized from multiple locations, from a distance, making one more aware of the environment. In an interior project a special wall, sculptures and artwork can be a potential landmark.

Figure 2-16: The Unique Shape of the Wall makes it a Landmark

Thus, the insightful use of these place elements can help increase the legibility of the interior environment. When they are orchestrated into a cohesive system they produce legible, coherent and pleasing environments. They help inducing the emotions of liking – disliking, happiness and pleasure.
**Spatial Qualities**

Once the space is coordinated into a cohesive scheme, the focus of the designer should be to manipulate the space further so the emotions are heightened and the consumer is aroused enough to spend more time in the space. According to Mehrabian and Russell (1974), complexity, novelty, variety of elements in a scene, and surprise or randomness of the external stimuli can induce feelings of arousal. These, according to Rengel (2003), are components of enrichment of space. The role of enrichment is to make the projects and the experience in them richer. Further, Rengel classified the enrichment strategies as: complexity, novelty, and enrichment when in transit, focal points, and grounding. Since not much empirical research is done in on this subject the author, to define these strategies, has used the definitions give by Rengel (2003) in his book ‘Shaping Interior Space’. The author has done a research of websites, which focuses on projects which are recognized to find the examples which best suit each category instead of focusing on the examples given in the book to make the terms clear.

**Complexity:**

Design features that add complexity can be anything from lines on the walls to a heavy articulation of the surface, ornamental features, or multiple and varied objects in the space. Complexity is rewarding as it stimulates the brain. However Berylene (1971) added that people tend to prefer environmental complexity up to a certain point and any further increase produces discomfort.

Environmental complexity occurs at many levels and can be produced in a number of ways. According to Rengel (2003) complexity can be achieved by:
**Surface Articulation:** The degree of complexity that can be achieved through surface articulation can be minimal, just to provide interest, or substantial, enough to challenge one’s senses and even overwhelm one. One simple way to provide it is by modulation. *Modulation* is subdivision of any surface into smaller components or modules. Thus by this, a simple wall can acquire sense of texture. Figure 2-17 (a & b) illustrates that wherein modulation is created by surface reliefs and adding reveals.

![Figure 2-17(a): Surface Relief](image1)

![Figure 2-17(b): Surface Reveals](image2)

**System Overlapping:** A project can be considered to comprise of following systems: ceiling plan, floor plane, interior walls, furnishings etc. These systems overlap to produce final composition. Thus by slight rotation of one of the elements, one can introduce complexity in the space. Figure 2-18 exhibit a space which reflects these qualities.
Novelty:

According to Rengel (2003) novel shapes and arrangements attract one’s attention and engage one’s mind towards the space. It can be due to uniqueness or unconventionality of approach taken. Examples of novelty include unusual shapes of spaces (figure 2-19), unusual treatment of visual elements, such as openings and elevations (figure 2-20) and unusual arrangement of spaces, such as the effect produced by taking an otherwise normal arrangement to extreme, as in the case of extreme geometry and rhythm (figure 2-12).
Figure 2-19 - Tribeca Issey Miyake, designed by Frank O. Gehry's. The 'Titanium Tornado' structure in the center of the space adds Novelty.

Figure 2-20: Usual Arrangement of the Space

Figure 2-21: Unusual Treatment of the Visual Elements
Enrichment when in transit:

People are highly receptive to environment stimulus when they are in transit. It is when they truly experience the fourth dimension of architecture and, visualize the physical environment changing and emerging as they move through the space. (Rengel, 2003). The components that enhance the transit are:

Events along the route- a sequence can be made engaging by transitions along the trajectory, and by the presence of distinct events along the way. Transitions can be changes in directions or transition in the physical character of the path (Figure 2-22 and 2-23 respectively).

![Figure 2-22: Altering the shape of path. By introducing panels at angle can make it dynamic and exciting.](image1)

![Figure 2-23: Changing the shape of the path. The zigzagging effect combined with a diagonal line makes it stimulating](image2)

Other possibilities of events are surprises, whether anticipated or not. These are often in the form of enriching encounters with meaningful objects, details and views. These may come as a total surprise or be anticipated destinations hinted at prior to reaching them (figure 2-24).
Figure 2-24: A View from corridor to another space

**Qualities of path** - Most paths are segments and tend to be long and narrow. We normally tend to travel along them in a linear fashion. As we move we see the sides of the path obliquely, from the near parallel relation of our line of vision to them. There are some views, planned or unplanned, at the end of the corridor which we see straight ahead and some distance away. As we move along we may, depending on the specific situation, see adjoining spaces (Rengel, 2003). Thus it is the designer’s job to make these paths special. Figure 2-25 demonstrates some ways of manipulating the shape of these paths so that they enhance the experience.
Figure: 2-25: Shape of Path

Modulation on side walls enrich visual qualities.

Corridors of different heights.

Pattern on ceiling and floor add texture.

Greater spatial texture.

Ceiling treatment adds interest.

Changing shape of corridor.
Views at the end: One of the most important aspects of the path is the view straight ahead. These views are usually focal points and enrich one’s experience in circulation areas. They are carefully framed and they include views of exterior or space beyond (figure 2-26) a piece of artwork or a sculpture (figure 2-27).

Enrichment is desirable in any space of the project, as human need both stability and stimulation when they move within a space. Thus by implementing these strategies, a desirable amount of enrichment can be attained which helps induce the feeling of arousal in the consumers. Positive arousal leads them to browse through the space more and spend more time and money in the space (Mehrabian and Russell, 1974).
CHAPTER 3: RESEARCH METHODOLOGY

The research methodology adopted here is the qualitative research method. According to Creswell (1994), the qualitative study is “an inquiry process of understanding a social or human problem, based on building a complex, holistic picture.” The research method is supported by the notion that the study is exploratory, and a little has been written about the topic before this time. Firstly, in retail design no study has been found to have determined a framework that systematically explains the relationship of design factors (one of the important categories of environmental stimuli). Secondly, emotional experience is one of the key goals of store planning and design. An understanding of the framework explaining the relationship of the design factors and emotional experience as a whole is necessary. Several empirical researches in marketing based on MR theory fail to holistically explain the interrelationship between environment stimuli or atmospherics and emotional reaction. Therefore, there is a need to further explore this area of study.

The central approach of this thesis will be ‘grounded theory’, one of the methods of qualitative research. In grounded theory the researcher attempts to derive a general abstract theory of process, action or interaction grounded in the views of the participants in the study (Strauss & Corbin, 1998). The proposed theoretical framework here is derived from integrating multiple theories and empirical researches, done by various researchers and academicians. This approach is known to be one of the methods of grounded theory in qualitative studies. ‘Grounded Theory Methods’ consists of systematic inductive guidelines for collecting and analyzing data to build middle range theoretical frameworks that explain the collected data. Throughout the research process, grounded theorists develop analytic
interpretations of their data to focus on further data collection, which they use in turn to inform and refine the developing theoretical analysis (Charmz, 2000).

In this thesis an attempt is being made to understand the existing theories and empirical researches from the designer's standpoint, and to make sense of the relationship between environmental stimuli and emotional response in the store setting. This thesis is an attempt to develop an exploratory framework and to form a bridge between design worlds and other new design.

The second stage of this thesis is to take the framework and redesign retail-mixed use space for EE Warren Opera House in Greenfield, a small town located in southwestern part of Iowa. An in-depth interview will be conducted with the natives and people actively involved in resuscitating the Opera House to understand the vision, objectives, history of the building and the era it was built in. This along with the framework would form the basis for the author to design the Retail-Mixed use space for the EE Warren Opera House. The outcome of the expected design would be to induce emotional reaction (pleasure and arousal), which would affect patron's behavior (amount of time and money spent, browsing intention, intention to return etc.) towards the space.

**Method:**

**The Setting:**

The study will be conducted on EE Warren Opera House. This is located in Greenfield, a small town in southwestern part of Iowa with a population of around 2500 (US Census Bureau, 2000). The building is listed on the National Register if Historic Places and is the focal point of the main street. The building was donated to Main Street Community and they would like to make it to a multiuse facility which serves as 'a social center for arts'. (As
told by Catherine Howe (member of the E.E. Warren Opera House building committee). The building has four floors, for the purpose of this thesis the author will concentrate on the first floor and the basement level which the owners envision as a marketplace for Iowa artists and mixed use facility.

**Stimulus:**

According to Rapoport (1982), people tend to evaluate environments with overall affective responses rather than analyzing specific aspects of the environments. Therefore from a macro perspective, a complete retail-mixed use environment will be used as a stimulus in this study. Patron's affective perception of overall retail atmospheric will be measured, rather than exploring the effects of one or two particular atmospheric stimuli such as music and lighting. The atmospheric elements that will be renovated in the retail mix used space of the EE Warren Opera House would include functional layout and spatial qualities.

**Subjects:**

Subjects will be the people actively involved in the main street development program of Greenfield and the State of Iowa and most importantly the EE Warren Opera House Association. Potential participants will be interviewed twice. The first interview will be an in-depth interview asking about their vision, objectives, and history of the building as well as the place to develop a thorough understanding about the project. A second interview would be conducted after the author had completed the design. The author would show them the redesigned space, interior elevations, interior views and finishes to give them a good idea of how the space would look like. An informal questionnaire would be given to them to get their feedback. This session would be made as interactive as possible. An interpretive approach would be adopted to decipher the end users reaction to the redesigned space.
Data Collection:

During the first stage of data collection, an in-depth interview would be conducted. This will be to develop a thorough understanding of the project. Once a space is redesigned based on the data gathered from the first interview and framework developed, the participants would be shown the redesigned space. A self-administered informal questionnaire along with an interactive session would be conducted to help understand the influence of improvements of environmental design on patron’s internal emotional state and behaviors.

The survey will consist of questions about the application of the framework and about the emotional state in the setting. Mehrabian and Russell’s (1974) pleasure – arousal (PAD) scale will be used to measure customers’ emotional responses toward the environment. This scale has been widely used in environmental design research (e.g. Donovan et al., 1994; Eroglu et al., 2003; Fiore et al., 2000). Few items would be utilized. The scale consists of 12 items measuring pleasure and arousal. The dominance aspect is being ignored in this thesis. In this study, six dimensions of each characteristic emotion will be used. See table 3-1. These dimensions would be utilized to learn how they feel about the space.

<table>
<thead>
<tr>
<th>Pleasure</th>
<th>Arousal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happy-unhappy</td>
<td>Stimulated-relaxed</td>
</tr>
<tr>
<td>Pleased-annoyed</td>
<td>Excited-calm</td>
</tr>
<tr>
<td>Satisfied-unsatisfied</td>
<td>Frenzied-sluggish</td>
</tr>
<tr>
<td>Contended-melancholic</td>
<td>Jittery-dull</td>
</tr>
<tr>
<td>Hopeful-despairing</td>
<td>Wide-awake-sleepy</td>
</tr>
<tr>
<td>Relaxed-bored</td>
<td>Aroused-unaroused</td>
</tr>
</tbody>
</table>

Table 3-1: Semantic Differential Measures of Emotional State
Thirdly, the question about patronage intention, attitude (i.e. intentions to browse the store more, money spent etc.) would be asked.

The questions asked about the implication of framework, their emotional response to the space and their intentions about approach and avoidance toward the space would be in form of a informal questionnaire where they could answer in: ‘yes’ and ‘no’ form as well as narrative description if they desire. An interpretive approach to decipher the results would be approached.
CHAPTER 4: ANALYSIS AND SYNTHESIS

The Mehrabian and Russell theory is considered a promising model among business researchers. Based on this theory, the researches completed so far are taken into account and an adaptive framework is developed based on the researches and the model itself. The central idea of this model is that approach behavior such as liking, positive motivation of exploration, and desire to stay, time spent and desire to come back to the store are influenced by store atmospherics and are related to perceived emotional dimension like pleasure and arousal. In this proposed framework the typology of atmospherics affecting the two emotional dimensions is discussed. Several studies conducted in business researches have not been able to holistically explain the role of environmental stimuli on emotional responses which might be due to the lack of understanding of store planning among the business researchers. Thus, this framework explains the relationship between store atmospherics and the outcome due to emotional responses.

Before proceeding further with the synthesis of the framework it is important to understand the terms used in the framework and define them clearly. Definitions of the terms are as follows:

Atmospherics:

Atmospherics, according to MR theory, is considered controllable environmental characteristics that convey physical and non physical elements within the setting, affecting the approach and avoidance behaviors of both consumers and employees (Mehrabian & Russell, 1974). ‘Atmospherics’ on basis Bitner (1982) has three components: ambient conditions, social factors and design factors. Ambient factors are taken as defined in the
marketing literature: odor, light, music and temperature; social factors are not taken into account in this research. Design factors are divided into two categories: functional layout and spatial qualities. These terms are well defined in the part IV of the literature review chapter. These same definitions will be the basis of design factors and will be also the basis of the design.

**Emotional Responses:**

**Pleasure:** According to M-R theory, verbal expressions of pleasant states that a person experiences in a space are: happy, pleased, satisfied, contended, hopeful and relaxed (Mehrabian, 1976, 1980, M&R 1974). Within a retail setting Donovan and Rossiter found that pleasure is a strong predictor of all measures of approach-avoidance behavior and is positively associated with willingness to spend more time and money (Baker., 1992; Donovan et al., 1994). Bitner (1992) also indicated that physiological responses are some of the independent internal reactions of the consumers. Comfort is a major reaction of the physiological responses. Therefore, pleasure can be understood as the physiological or mentally comfortable feeling induced by atmospherics.

According to researches done in past, the atmospheric conditions effecting pleasure are ambient factors and the functional layout. Ambient factors as described in marketing research are lighting, temperature, sound and odor. Functional layout, according to marketing research, allows consumers to continue or complete their shopping task. The functional layout as described in Chapter 2, literature review part IV (based on the interior design factors) is comprised of these components: destination space, circulation system -arrival space, main and secondary path and nodes; boundaries-edges, andLastly objects – furnishing and landmarks. Thus the insightful use and manipulation of the above factors when
orchestrated into a cohesive system produces a coherent, physically comfortable and a pleasing space. By synthesis of these theories, a framework is developed (see table 4-1) which would help develop a space for pleasure and the expected outcomes would be approach towards the store.

**Table 4-1: Framework for Pleasure**
Arousal:

Atmospheric dimension affecting arousal is associated with sense modality. According to M-R theory, arousal is understood as the feeling state that the subjects experience and the degree to which these subjects are aware of the stimuli. It can be achieved by combination of low task and high information or by a combination of high task and low information rates. The information rate depends on the complexity, novelty and variety of elements in the scene. ‘A high load environment (i.e. novel, surprising, crowded, complex etc.) will make a person feel stimulated, excited and alert. On the other hand, a low loaded environment will result in a feeling of calm, relaxation or even sleepiness’ (Donovan and Rossiter, 1982, pg 40). Thus, information rate is conceptualized as degrees of perceptions elicited by environmental stimuli such as complex, novel, random, intense, jarring, dissonant, heterogeneous, intermittent, rare, surprising, asymmetrical, close, crowded, meaningless, or dense. Mehrabian and Russell (1974) further note that “All such concepts somehow relate to the idea of information because temporal or spatial patterning serves to increase disproportionately the conditional probabilities of certain components at various parts in an arrangement, thereby reducing uncertainty (i.e. the amount of information)”.

The strategies of enrichment as discussed in chapter 2 can be used to create an atmosphere which can induce the feeling of arousal (excitement, stimulated, frenzied, jittery, and wide awake and aroused) in the space. The strategies of enrichment are discussed in detail in Chapter 2, and the author will adhere to the same definition for the purpose of developing the framework as well as design. Again, by synthesis of the above theories, a framework is developed to induce arousal in the space; (table 4-2) explains that relationship.
Based on the theories and empirical researches, a framework developed would be implemented to the design of the case study which would be discussed in the next chapter.
CHAPTER 5. CASE STUDY

In this chapter the proposed framework is applied in designing retail-mixed use space as a case study. The EE Warren Opera House located in Greenfield, Iowa is utilized as a case study. The purpose here is to apply the proposed framework as a guideline to the case study. Further, whether the enhanced design induces emotional response among patrons will be analyzed by means of a questionnaire and an interactive session. This will further demonstrate how an application of a proposed framework in an actual design process helps to connect academia with the practical world. Boyer (1990) supports this concept as stating “the scholarship of application”. He further adds that this new intellectual understanding can arise out of the very act of application (Boyer, 1990, pg3). The case study will eventually contribute to further studies in the interior design field.

EE Warren Opera House:

Background:

The EE Warren Opera House was built in 1896 in Greenfield, Iowa. Greenfield is a city located in Adair County in southwestern Iowa. It was founded in 1856; just five years after Adair County was organized. The name Greenfield was chosen because the location was green and luxuriant. The place has a firm agriculture and industrial base. According to US Censes of 2000 there are 2,129 people, 937 household, 580 families residing in the city.

In 1996, Greenfield became a Main Street Town known for the way it successfully reconstructed itself and preserved its quality of environment. Thus it is one of the thirty three communities in Iowa that have joined the coast-to-coast movement led by the National Main Street Center, involving more than 1,000 communities across the country. Downtown
businesses will supply the leadership necessary to improve and integrate all commercial areas, helping to strengthen the economic base of the community. Thus, downtown will symbolize the self sustaining Greenfield experience alive with business and family activity (Moody, 1915). Greenfield downtown, or main street, is also called 'Greenfield Square'; is a compact collection of historical and commercial buildings. The district provides high quality goods and services to Adair County and adjacent townships in a twenty miles radius.

![Figure 5-1: Map of Greenfield](image1)
![Figure 5-2: EE Warren Opera House](image2)

EE Warren House is a focal point of the focal point of the square and was originally constructed to house the EE Warren dry goods store on the first floor, theatre auditorium on the second floor with a capacity of 600 people on movable seating, apartments on the second and third floor with parquet floors, painted walls and ceilings, oak pocket doors and ornate stenciling in all rooms where the proprietor resided (As told by a native of Greenfield). The building is listed on the National Register of Historic Places, offers both historic and sentimental value to the Greenfield community. The traveling shows and home talent productions brought to the community its taste of dramatic arts. In the most Iowa cities, the old ornate façades of the Opera theaters are gone, but Warren Opera House in Greenfield,
long closed still served as a reminder of when this institution shared its honors with the others in community life. The brief history about the occupancy of the Opera house is as follows. This information is based on the first series of interviews conducted.

- 1896 - Built by EE Warren
- 1897 - Dry goods store with clothing, rugs and linoleum sold. There was an ice cream parlor in the basement
- 1916 – Tea Room in the basement owned by Mary Ferguson and also a beauty parlor was there.
- 1928- The Golden Rule occupied the first floor
- 1956 – New store and aluminum front was installed on Golden Rule.

The building was donated to the main street by Yvonne Schildberg in 1996 and is owned by the Warren Opera House Association, a 501© (3) a non profit corporation.

**Mission Statement:**

The building is listed on the National Register of Historic Places, and offers both historic and sentimental value to the Greenfield community. The objectives which the association along with the main street development program have determined is to make it a multiuse facility which serves as a social center of arts; as site for community dances, theatre performances, and a marketplace for Iowa artists providing education in rural, cultural and fine arts. The aim here is to transform the building into a self supporting ‘cultural oasis’ reflecting the quality and pride in the past generations.

Formal feasibility studies were done over a period of time by the Association as well as the Main Street Community to understand the nature of activities that could be possible within the building. The results of the surveys are as follows:
1980 Iowa Appraisal and Research Corporation Market Feasibility Study: The purpose of the study was to learn the extent of the market demand for additional restaurants, meeting and entertainment facilities. Their reports indicated that opera house could support on an average four major entertainment functions per year and that the first floor should be utilized for the retail commercial enterprise. It also indicates the Greenfield market could support an additional restaurant facility.

The 1996 structural engineer’s study by Charles Saul Engineering: Reports indicate the building to be structurally sound, and made recommendations for the step by step process to alleviate further deterioration and weather damage. It recommended an elevator for access to all four floors (ADA requirement as well) and stated auditorium capacity of 300 people.

The 1997 L.A.C.E.S (local arts group) community assessment showed a substantial need for more arts and cultural opportunities in the community.

The 1998 technical visit by Main Street of Iowa consultant was a fact-finding visit focused on defining the goals and future plans of opera house. Results: the project should create jobs and provide economic advantages to the area, such as an increase in tourism and a boost to business development.

The 1998 arts marketing survey was completed by 273 residents of Adair County, a viable sample which represented every age, income, and educational background for the county. Responses indicated an overwhelming endorsement of the importance of the arts to community life and indicated residents have an interest and willingness to attend cultural activities.

Finally, the common ground visioning process offered these observations and recommendations: revive the Cumberland Rose Players Theatre Troupe, continue and expand
use of the opera house as site for art events, bring plays from the Des Moines Playhouse and Des Moines Metro to the opera house to give greater exposure of professional performers to local citizens; develop a county website; promote a county fact tour. Festival and attractions such as an opera house art exhibition were listed as assets of the county.

Based on the above surveys, the Warren Opera House Association determined the activities that building would accommodate once the building is renovated:

- Hosting tours of all four floors because all will be accessible to all persons
- Additional entertainment opportunities to be offered on the theatre and basement floors
- A retail business can consider renting the first floor
- Educational programs to include artists in residence
- Rental of basement and theatre floors for meetings, wedding receptions and other community events
- Possible artist studio space
- Additional art exhibitions

Keeping these activities in mind the Association developed a Multi Phase Master Plan:

The **master plan** for the space usage for all four floors centers on the building as a cultural arts center for southwest Iowa.

- **Basement**: a work of art, with original limestone walls, the two rooms will have access from the street via steps the original building had, by elevator and by the two interior stairways. Plan is for the space to be divided into two distinct and different uses: a bistro and a workshop for artists.
• **First Floor:** retail shops including coffee shop/deli also featuring organic vegetables locally grown at the Henry Wallace Country Life Center, and other locally produced products; Iowa artist’s gifts and gallery with traveling exhibits; lobby entrance to access all four floors by elevator, office for the opera house manager, headquarters for Greenfield Chamber/ Main Street and Adair County Tourism.

• **Second Floor/Theatre:** auditorium with movable seating, stage, and apartment space restored and remodeled as lounge and reception area overlooking the historic Greenfield square.

• **Third Floor/ Balcony:** public restrooms, lighting, sound, technical rooms, studio space.

These were the programs sketched by the Association, but it always welcomes any suggestion or inputs from designers involved in the project. These programs are implemented in various phases which are described below. The first phase has been completed and committee is moving towards the second and the third phase.

**Restoration Phases:**

**Phase I:**

- basement tuck-point repair interior and exterior
- repair and tuck-point exterior east wall
- roof repair
- repair / replace windows and frames of 2nd and 3rd floor
- prime and paint exterior window frames
- remove water damaged floors, ceiling, wallboard in basement and replace with concrete floors, leaving tuck pointed interior walls
- install new floor drainage system, including sewer pipes and plumbing
- complete elevator specifications
- install pumps and elevator pit
- install elevator shaft

This restoration phase is complete.
Phase II

- repair and replace copper turret and copper trim on exterior of building
- repair and replace wooden structural and window framing in turret
- install elevator car and complete electrical and mechanical work.
- Replace first floor doors and windows, install original display window on the first floor north side; install awnings.

These two aspects are complete; however installation of awnings is not yet complete.

- complete floor plans for all four floors
- obtain design concept drawings for exterior and interior and install outside entrance from stairway and sidewalk improvements

The association intends to do this by October of 2005. The attempt of this thesis is to design the first and basement level and give them the rendered drawings for the above purpose.

Phase III

- finish interior space of the first floor to make available for rental
- obtain drawings for theatre, apartment (lounge/reception areas)
- finish basement space including ceilings, restrooms, heating, air condition and lighting

Phase IV

- complete balcony/3rd floor remodeling of public space, studio
DESIGN ANALYSIS

Pleasure:

Pleasure is defined in the framework as physiological or mentally comfortable feeling induced by the atmospherics. Ambient conditions (such as lighting, temperature, odor and sound) and functional layout (destination space, circulation system, boundaries and objects) are hypothesized as the atmospheric dimensions inducing the emotion of pleasure.

Since the existing facility is more in a design development stage, the existing conditions as well as the schematic design developed by the architect working on the project are taken into consideration for the purpose of the design analysis.

Design Analysis of the First Floor:

Ambient Conditions:

Lighting: All the exterior windows on the north side of the building have been blocked. The only source of the daylight is the windows on the west side of the building, which brings in considerable amount of light in the front part of the building. The main source of light are the fluorescent light strips suspended from the ceiling exhibited in figure 5-3 and 5-4. The level of lighting and the kind of lights is not appropriate especially for the purpose the floor would be used. Figure 5-5 reflects the analysis of the quality of light in the space.

Figure 5-3: The Fluorescent Lights Strips

Figure 5-4: The Blocked Windows
Figure 5-5: Analysis of the Quality of Light on the First Floor Level

- NO DAYLIGHT SOURCE AT REAR PART OF BUILDING
- NO TEMPERATURE CONTROL
The client’s vision is to utilize the floor as a lobby/reception area for all three floors and rest of the space as a retail space for Iowa artists, gift shop, a center for Henry Wallace’s organic food and a deli/coffee shop. Thus, the lighting of this floor needs to be re-planned. Pendant, track and can lights needs to be introduced in the space and the windows needs to unblocked get in more daylight.

The temperature and music once the design is being developed needs to be planned as well.

**Functional Layout:**

On the basis of the framework developed, the components that coordinate into a cohesive scheme to form the functional layout of a space are: destination space, circulation system, boundaries and objects. An insightful arrangement of these elements produces a physically comfortable and pleasing space.

Figure 5-6 show the plan developed of the first floor and figure 5-7 exhibit the schematic plan developed by the architect of the project.

**Destination Space:**

The destination space on the first floor would be the lobby/reception area on the west side of the building. The rest of the floor will be retail space for Iowa artists, gift shop and the deli/coffee shop. The existing plan exhibits the zoning of these spaces as shown in figure 5-6. These destinations needs to be defined by means of legible circulation system, introducing nodes and landmarks and further needs to be enriched as. These factors would help inducing emotions of pleasure and arousal in the space.
Figure 5-6: Design Analysis of the Existing Conditions of the First Floor Level
Figure 5-7: Design Analysis of the Proposed First Floor Level by the Architect
Circulation Space:

The circulation system comprises of the arrival space, main and secondary paths and nodes.

**Arrival Space:** Arrival spaces are occasions of transition between inside and outside of the building as well as between themselves and rest of the project (Rengel, 2003). The arrival space here is the lobby / reception area located on the west corner. The service area including the elevator and staircase for transportation to different levels is located in one corner. The two display windows are also a part of this area. Figure 5-7 exhibits the architect’s plan for this area. The space comprises of the ticket office, rest room and the service area (elevator, staircase and ramp). All these spaces are compartmentalized and fail to create a sense of entry into the space. The art gallery which is the most important part of this floor is obscured completely. The space needs to be redesigned to create a sense of arrival in the space.

**Main Path:** The circulation is not defined in any of the plans. The columns in the center divide the space symmetrically and form a strong visual or main axis. Thus they can be utilized to create a main path, which can get one to the prominent destination and define the overall movement in the through the structure. Figure 5-6 reflects the main path in the center of the building.

**Nodes:** Lynch (1960) explains that nodes are junctions, like a convergence of paths, or concentrations, like an enclosed square. They become in – between places to stop and step off the path or an expanded and emphasized location along the path.
Both at the arrival space as well the destination space the nodes are needed. They can be further emphasized by use of the interior features like dropping the ceiling, using accent colors, change of flooring and introducing some unique design feature.

**Boundaries:**

Places relate physically to each other in terms of the levels of separation and/or connection their edges allow (Rengel, 2002). Edges thus are the boundaries between the two places and can be more or less penetrable barrier, closing off one region from another.

Analyzing the schematic design by the architect, the edges in lobby/reception area are less penetrable creating space within space as shown in figure 5-7. The edges need to be transparent here for the space to flow and also have some visual connection with the destination space on this floor. The destination space will house retail space for Iowa artists, jewellery display, gift shop and deli, thus each area needs to be defined by means of the edges yet these edges should be penetrable for ease of movement through one space to another.

**Objects:**

The objects in the scheme include furnishings and the landmarks. These are important components to define the space and needs to be planned, so that they become a part of the space and also define it.
Design Analysis of the Basement Floor:

Ambient Conditions

Lighting:

The basement would be used for the purpose of bistro/restaurant, kitchen and artists workshop. The Warren Opera House committee used this space to host couple of different functions. They have suspended lights from the exposed beams. Figure 5-8 exhibit that. These lights are appropriate for this setting and blend adequately with materials like brick as well as the concrete.

There is a need to increase the level of illumination by introducing some wall sconce and pendant lights. There is no source of exterior light in the building as the north windows are blocked, as reflected in figure 5-9, thus these needs to be opened to get some daylight. The kitchen for the restaurant needs to have some fluorescent lights.

Figure 5-8: The Lights Suspended on the Beams

Figure 5-9: The Blocked Windows on the North Side
Functional Layout

Figure 5-10 shows the plan developed of the first floor and figure 5-11 exhibit the schematic plan developed by the architect of the project.

Destination Space:

The destination space here is the bistro, the artist’s workshop and the kitchen. These spaces are accessed by the elevator, the staircase on the east end of the building and from the outside by the stairway which leads to the entrance on the east side. These spaces are designated on the plan but needs to be designed on the basis of the framework.

Circulation System:

Arrival space: The arrival space for the bistro is the cash register/reception area and should be in the range of visibility from all points of entry. Thus, this needs to be incorporated in the design of the space. Another entrance is from the east end of the building, and instead of a well defined reception area a unique design element helping consumer to find their way in the building would be helpful.

Main Path: The floor has the main axis defined by the row of columns running in the center of the building as seen in figure 5-14. The spaces can be planned around this main axis, creating a visual interest along this main path by playing with solid and voids.

Nodes: Nodes are always points of relaxation along the main path and some nodes can be definitely planned around the main path as well as in the bistro area.

Boundaries:

Edges: The main destination spaces are the bistro and the artist’s workshop. These spaces should have a sense of enclosure and still visually relate to each other. Thus the edges should be interplay of penetrable and non penetrable elements.
Figure 5-10: Design Analysis of the Basement Floor Level
Objects and Landmarks need to be planned in the space.

The second part of the design analysis is to learn more about the past of the building, the visions and objectives the Warren Opera House committee had towards the space.

A series of interviews informal were conducted three times with four members who are actively involved in the design committee of the Warren Opera House. The questions were pertaining to the programming phase, how do they envision the space, what past elements do they want to incorporate in the space and also learning more about how the building was in that time.

The groups envision about the spaces based on the in-depth interview were:

**Basement:**

The spaces to be incorporated on this floor are: bistro along with a movable stage, kitchen and the workshop. The author suggested a bar and some lounge seating to be accommodated in the bistro which can act as a node respectively. The group agreed to it. The group wanted to keep the structure as exposed as possible, but would like to introduce some accent colors to create interest. The bistro was planned to be on the north end of the building and the workshop on the southern, approachable from all entrances.

**First Floor:**

The reception area for all the three floors is to be accommodated on the front part of the building. Since it is the entry to the entire building, the group wants it to reflect the past, thus the furniture and lighting needs to be of that period yet keep it as simplistic as possible. They had panels of that period and would like to see them reused in some form. The author suggested the best use for these panels were to be utilized as the front panels for the reception desk. There are some artifacts restored from the building and would like to see it displayed.
The rest of building would be the retail space for Iowa artists work including jewellery, painting and other crafts, a gift shop with the deli/ coffee shop at the rear end. A section is to be devoted to the Henry Wallace Life Center wherein all the organic food as well the books and painting will be displayed. All this display work should be interspersed with seating for the deli with music and gallery lighting. They wanted the structure to be as exposed as possible yet the interiors to be minimalist. The furniture used in this space should be stackable and modern.
DESIGN DEVELOPMENT

The organization of design development follows the proposed framework developed in Chapter-4. The design process may not be step by step although the main body of logic in a design process does exist. One cannot ignore the possibility that some solutions can be generated while the designer is accomplishing different or relevant tasks. For instance, while developing traffic circulation pattern that is related to pleasure, the designer might find solution to enhance arousal level by enriching the route. In this case, it might be more understandable if the findings are described in context. It is therefore possible to indicate other information along with these design development. The design development for the Warren Opera House is divided into two parts: pleasure and arousal.

Pleasure:

Ambient conditions such as lighting, music and temperature and functional layout (destination space, circulation system, boundaries and objects) are hypothesized as atmospheric conditions which would induce emotional dimension of pleasure on the basis of the framework developed in Chapter -4.

The design development of the first floor is discussed first. As per the interviews and the discussions with the committee, the functions to be accommodated on the first floor are: lobby, reception/waiting lounge, and deli/coffee shop, retail space for Iowa artist, jewellery display, gift shop and space for Henry Wallace Center for organic food.

Ambient Conditions:

Ambient conditions include: lighting, music and temperature. To enhance natural light in the space, all the exterior windows on the north side are unblocked. The storefront
windows on the west side (the main entrance) have been made taller to bring in ample to light in the space.

The existing fluorescent light strips hung in the center from the ceiling fail to create an ambience needed for the art gallery. They are replaced with track lights and pendant lights. The lighting plan is developed once the complete floor plan is developed.

Music and temperature control is beyond the scope of this thesis and have not been accounted for.

**Functional Layout:**

According to the framework developed in Chapter 4 functional layout is an insightful use of elements like destination space, circulation space, boundaries and objects. When these elements are orchestrated into a cohesive scheme they produce a legible, coherent and pleasing environment inducing the emotion of liking and happiness.

**Arrival Space:** According to the framework the destination spaces needs to be defined first. The destination spaces on this floor are the: retail space and the deli/coffee shop which are followed by the reception/ waiting lounge. Thus, it makes sense to discuss the arrival space first.

As one enters the building, the two windows on either side are utilized for the purpose of display. The one on the left side, for all the travel shows, art exhibits and the one on the right side, for the theatre display. This provides visitors the image of the Opera House and the activities that are taking place within. The arrival space according to Rengal (2003) gives the visitors their first impression of the building or project; whatever message that is to be communicated to the user begins here. The reception/waiting lounge here besides representing an important transitional space from immediately outside, and between itself
and rest of the facility should communicate to the visitors the history and the past if the building itself.

The row of columns in the center creates a strong visual axis and divides the building symmetrically is two parts. As one enters, the elevator is located to the right side, thus it makes sense to confide the entire service core close to that which includes the staircase leading to the second floor as well as the basement level, the ramp for the handicap accessibility and the rest room along with a storage space. On the other side of the columns is the reception desk. The display panels hung on each window gives the reception desk it a nice backdrop. It is more defined by suspending translucent ceiling with down lights. As a reminder of past, counter front of the reception are the panels restored from that period juxtaposed with the glass transaction top thus adding novelty (arousal) to the entire area. Figure 5-12 reflects the design of the reception area.

Next to the reception desk is the waiting lounge which is a good place for visual relief and act as a node. There was a signage of the ‘E.E. Warren Dry Goods’ and painted on the theatre level. On the north wall the same signage painted using the same font and colors bring essence of past into the space which the group envisioned. Figure 5-12 exhibit that. The east wall has panels which have pictures of the art exhibits as well as the pictures of the Opera House in different stages of renovation, the public square and Adair County.

Thus the verbal information as well the engaging graphics offers opportunity to provide information about the building and entity housed in the building. Figure 5-13 helps explain this organization of spaces better.
Figure 5-13: Design Development of the First Floor-Plan for Pleasure
Destination Space:

The destination spaces are deli/coffee shop which is to be at the rear or the east end of the building. The space comprise of counter for serving, the bar height counter with bar stools, and some seating along with the display near the display windows which would be unblocked for the above purposes.

Second destination space for the people visiting this floor is the retail space. This space is between the reception/lobby area and the deli/coffee shop. Retail portion will accommodate Iowa artist’s work including jewellery, pottery, craft and gifts and painting. A section also needs to be devoted to the Henry Wallace Country Life Center, where all the organic produce along with the books on Wallace needs to be displayed. Figure 5-14 explains the zoning if these spaces. These spaces have to intersperse with the tables and chairs for seating of the deli area.

There is a strong visual axis, which runs through the center of the building which is physically defined by the row of columns. This divides the building symmetrically into two parts, the way the functions are separated is the gift shop, craft items, pottery on one side with seating interspersed with seating. The other side comprises of jewellery display followed by the painting panels on the northern wall. The jewellery display is further emphasized by dropping in translucent panels with pendant lights on them. Thus this helps defining it better and makes it intimate space adding some visual interest.

Another entrance to this area which is the secondary entrance is from the north door. A cash register is strategically placed on the right. This helps visualize the cashier the entire retail area better and also render help to customers when they need it. The area is again defined dropped ceiling, pendant lights, accent wall which gives a backdrop for the walnut
Figure 5-14: Design Development of the First Floor Level-Functional Layout of Spaces
color cash counter with glass transaction top. Due to the location and these distinct characters this becomes the landmark in the retail space. Figure 5-13 reflects the complete design development of the floor plan.

**Circulation System:**

The circulation system comprises of arrival space (which has been discussed), main path, the secondary path and nodes. The row of columns in the center form a strong axis and divides the building symmetrically.

**Main Path:** This central axis is utilized and the main path is carved around it. This main path helps perceive the totality of the project, its spaces and their sequence. This is the principal movement system to get to all the spaces and terminates into the deli which in the end and forms a strong focal point and the way it is treated act as a landmark for the entire building. Figure 5-13 explain this main path. In between the columns the objects found in the building, like old music box, ledger etc. is placed. By presence of these distinct events along the way the sequence along the trajectory is made very interesting (events along the route – arousal). Also moving along this path, one encounters so many different activities, areas of interest, thus making the entire transit engaging. Figure 5-15, 5-16 and 5-17 explains the conceptual development of the main path.

This main path is again defined more with the floor pattern and suspended pendant light which brings the scale down. The bulkheads painted in accent color on either side define its edges distinctively. The sequences on events on either side of the path renders it high visual quality. Figure 5-18 exhibit the floor pattern of the path, which is a combination of two different types of tiles.
**Nodes:** Nodes are the places at given point of the paths which act as architecture enhancers. They provide point of relief, social contact, accentuates transitions and created memorable spaces along way. The different nodes in this floor are: first, the waiting lounge in the reception area. It is made more intimate by dropping in the ceiling over it. Period furniture from 1800’s is selected to add that historical character to that space.

Second, node is the tables and stackable chairs and lounge seating in the retail area which provides a break space for people visiting the gallery as well as comfortable seating in the nice ambience for deli. Third node is the seating in the deli/coffee area near the east display window. The seating is grouped so that it creates a nice enclosure as well faces the window to get the nice view of outside activities. Figure 5-13 highlight these areas.

**Boundaries:**

Edges, a component of boundaries help relate places to other places in terms of levels of separation and /or connections. Firstly the edge between the arrival space and the retail space is defined by the transparent material – glass door and windows as well as wall. Thus, glass provides a degree of physically connection between the two spaces. As one enters one can get a sense of familiarity with what activities are taking place inside. Figure 5-13 explains this relationship.

The edges between the main path and the retail space on either side are more penetrable and are defined by use of bulk heads on either side. The edge at the end i.e. between the deli and the retail space is defined by mostly solid wall having an opening in the center to provide a visual and physical connection between these spaces.
Dropping the ceiling plane creates interest in path.

Figure 5-15: Dropped ceiling on the Jewellery Display

Figure 5-16: Events along the main path

Figure 5-17: Views at the end of the main path
**Objects:**

The landmarks in the space as discussed earlier are the cash register, the deli counter being the focal point.

The furnishings are referred to as fixtures and furniture pieces. The fixtures here are firstly the display units used for keeping the art work on them and are placed in front of the display windows. They are very simplistic, a cube painted in black to highlight the art work more. The display units for cards and books in the gift area are of unusual shape thus adding novelty (arousal) to the space. The furniture in the lobby area is more like period furniture helping bring back time into the space. The furniture in the retail area comprises of contemporary, stackable chairs and lounge furniture. The one in the deli are again contemporary, more timeless bar stool and the modular seating which are in tune with the character of the space. The seating are grouped so that they form a sense of enclosure and complement the overall effect of the spaces.

Thus, Figure 5-19 exhibits the arrival spaces, destination space, main path, nodes, furnishings and landmarks disposed in an integrated scheme. Such a clear, legible scheme does induce a feeling of pleasure. To add more qualities to the space, the various strategies of enrichment are applied to the space to induce a feeling of arousal.

**Arousal:**

It should be taken into account that the overall arousal level of the space should be considered and should be moderate. In other words if one specific area is well designed and arousal is at an intermediate level; too many independently achieved arousal level should remain as intermediate. Figure 5-20 explains the overall arousal control plan in the whole store. The various enrichment strategies being adopted here to achieve this are:
Figure 5-19: Design of the First Floor Level
Complexity:

Design features that add complexity can be anything from lines on the walls to a heavy articulation of the surface (Rengel, 2003). Environmental complexity can be produced in a number of ways, firstly surface articulation and another means is surface overlapping.

**Surface Articulation:** The surface articulation on the reception wall, the wall exhibiting the paintings and travel exhibits and the display wall for organic food as well craft items is achieved through surface modulation, regular lines (reveals) on the surface as well by means of the surface relief. The degree of complexity induced here is very rich, yet minimal thus taking one the highest order of arousal, but producing a moderate effect. By dividing the wall into modules by means of these regular lines the wall acquires a sense of dimension well as lot of texture. Figure 5-21 and 5-22 exhibits that in the reception as well as the painting display areas of the retail space. Figure 5-23 exhibits the waiting lounge; the modules in the floor and ceiling grid add complexity to the composition. Figure 5-24 exhibits the organic display area with the surface relief there. Thus, advancing and receding the part of the surface helps create a more pronounced surface articulation.

**Surface Overlapping:** A project is considered to comprise of ceiling, floor plane and furnishings and interior wall, thus these components overlap to produce a final composition. Figure 5-25 and 5-26 exhibits the manipulation of the vertical heights of interior wall planes. Adding unique shape to the furnishings does add complexity to the space.

**Novelty:**

Spatial novelty can be produced by the nature of individual masses and elements in space and their shapes, and also by their combination into specific arrangements. Thus on this floor, to break the rectilinear quality of the elements the curved counter of the deli, the
Figure 5-21: Surface Articulation of the Reception Area Wall

Figure 5-22: Surface Articulation in the Waiting Lounge

Figure 5-23: Surface Articulation in the Painting Display

Figure 5-24: Surface Articulation in the Organic Display Area
Difference in height of all vertical members, overlap and produces spatial complexity.

Figure 5-25: Surface Overlapping in the Retail Area

Bulk head

Sculpture stand

Rotated

Painting planes

Class doors

Play solid & void

Figure 5-26: Surface Overlapping in the Reception Area
period counter front of the reception desk juxtaposed with the glass transaction top and the unusual shape of gift display are introduces which add novelty to the space. Figure 5-27 and 5-28 exhibit the conceptual development of the two things.

Another important component that adds enrichment to the project is the enrichment when in transit. While designing the main circulation path most of the elements were taken into consideration to make the path interesting and enriching the movement. The placement of antique objects recovered from the opera house in between the columns, floor pattern, suspended lights to bring down the scale of the main path, interplay of voids and solids, modulation of surface on the side of the path and most importantly views at the end makes one absorb more in the surroundings and produces an state of alertness and arousal. Figure 5-29 and 5-30 exhibit the conceptual development of the main path.

Based on these components Figure 5-19 indicates the final floor plan of first floor level of the Opera House. The floor finish and reflected ceiling plans are also developed. The interior elevations and sections and the perspective views are all exhibited in the Appendix.

**Basement Floor Plan:**

As per the interviews and the discussions with the committee, the functions to be accommodated on the basement floor are: bistro, bar space, lounge seating and cash register, rest rooms, artist’s workshop and the kitchen for the bistro.

**Ambient Conditions:**

Ambient conditions as discussed earlier includes: lighting, music and temperature. There is no source of daylight in the space as all the exterior windows on the north side and have been blocked. First attempt here is to enhance natural light in the space, for this purpose
Figure 5-27: Curved Counter of the Deli Area

Figure 5-28: Unusual shape of the Reception Desk and the Gift Display

Figure 5-29: Curved Counter of the Deli Area providing View at the End

Figure 5-30: Creating Visual Interest along the Path
all the exterior windows on the north side are unblocked. The committee has hosted few ceremonies in the space. It is a complete brick structure with concrete floor and exposed concrete beams. Track lights are suspended on these beams which go very well with the entire ambience of the building so are left the way they are. Although the level of luminance is not so adequate, so in the bistro some pendant lights and wall sconce are introduced. In the kitchen fluorescent lights and can lights in the rest rooms are introduced. The artist's workshop also has some can lights as well as some fluorescent lights. The lighting plan is developed once the complete floor plan is developed.

Music and temperature control is beyond the scope of this thesis and have not been accounted for.

**Functional Layout:**

Another component to generate the emotional response of pleasure in the space is by coordinating the elements of functional layout (destination space, circulation space, boundaries and objects) into a unified scheme.

**Destination Space:**

The destination space on this floor is the bistro/bar space, artist's studio and the kitchen. On this floor too the row of columns in the center of the building divides the space symmetrically into two parts. Bistro is located on the north side of the building; the other side has artist's workshop, restrooms and other service area. At the rear end is the kitchen, which will be close to the bistro and also secluded from rest of the activities. Figure 5-31 exhibit the zoning of these areas.
Figure 5-31: Design Development of Basement Level – Zoning Plan
Circulation Systems:

The circulation system comprises of arrival space, main path and the secondary paths.

**Arrival Space:** The points of arrival to the building are from the elevator and the west entrance from outside the building. As a part of the building program there was not a need to have a formal reception area but some informal point of entrances. The cash counter is strategically located so that it is in the range of visibility of the customers entering from either entrance. The unique design of the front panels with glass transaction top, the suspended exposed wood ceiling with pendant lights, the accent color walls with paintings contribute greatly to sense of order, enrichment and expression of this space. Figure 5-32 exhibit the design of this space.

The second entrance from the first floor is from the east staircase. As one descends one sees the blank wall which is treated with a curve bulkhead and base which almost directs people inside the building. The accent color wall has reveals and exhibits information about the building. This special articulation and the pendant lights suspended from the bulkhead serves to make an initial overall impression and serves as a point of departure by orienting them towards the building. It also becomes an important landmark feature on this floor. Figure 5-41 exhibit the conceptual design of the wall and figure 5-33 exhibits the placement of it.

**Main Path:** The overall movement through the structure and to the prominent destination is defined by the main path with runs along the center on the building. On one side is the bistro, which has walls and some windows, thus this interplay of solid and voids helps give an impression of the space beyond and creates a visual interest. On the other side of the main path is the artist’s studio, which is not an enclosed room but the defined by the
perforated metal and translucent walls. The walls of the service area facing the main path have an art niche. The surface articulations help provide a visual and sensual experience and provide a sense of sequence.

More interest is being added to the path by floor pattern, which bring down the scale of the long path by introducing a metal strip at an angle and two color tile on either side. Figure 5-34 exhibit the floor pattern of the main path. The organization of the furniture creates two main paths in the bistro area, thus this helps create a nice legible scheme. Figure 5-33 exhibit that.

**Nodes:** Nodes are places at given points of the path which become places to stop and step off the path or expanded and emphasized location along path. Thus along the main path the artist’s workshop renders that kind of quality. It has a sense of enclosure defined by the metal and glass wall, the down lights and furniture arrangement offer relief, social contact and accentuates the entire transition.

Another node is the lounge seating in the bistro. The seating forms an intimate sense of enclosure and the special features like the flooring material change, accent color wall and the floor lights makes it a memorable junction. Figure 5-35 exhibit that. Besides the lounge seating the bar area is also an important node. The rich architectural features like suspended ceiling, pendant lights, style of the table and bar stools further accentuates the space and makes it an important node in the space.

**Boundaries:**

One of the most important components of boundaries is the edges. Edges according to Lynch (1960) are boundaries between two places. The two main spaces on this floor are the bistro as well as the artist’s workshop along with the service area and kitchen which are
Figure 5-32: View of the Cash Register and the Lounge Seating
Figure 5-33: Design Development of Basement Level – Plan for Pleasure
Figure 5-34: Floor Finish Plan of Basement Level
enclosed and have penetrable edges. The two main areas should have a sense of enclosure yet visually relate to each other. The edge of the artists’ workshop is not rigid wall but a combination of metal and glass panels suspended on metal supports. There are not full height walls thus rendering transparency to the main path as well. The wall of the bistro is interplay of the solid and void, void being the windows and metal frames (windows were restored from the building that was built in that period) are used. This gives a nice textural quality to the wall and experience to move through the main is enhanced by the variety and contrast created (creating a feeling of arousal by enhancing the path).

**Objects:**

Objects comprises of furnishings and landmarks.

*Furnishings* are fixtures and furniture pieces. Reception desk / cash register in the bistro is a furniture piece. The interplay of geometry and material, floating ceiling over it makes an important space modifier. The grouping of the furniture in the bistro creates intimate bays as well as gives the space a level of balance and harmony and incorporates a sense of order within the space. Figure 5-35 exhibit that.

*Landmark:* The unique shape and color of the display wall as one enters from the east end of the building makes it a landmark on this floor. It also adds novelty (feeling of arousal) to the entire scheme.

Thus, Figure 5-36 exhibits the conglomeration of arrival spaces, destination space, main path, nodes, edges and furnishings and landmarks into an integrated scheme. Such a clear, legible scheme does induce a feeling of pleasure. To add more qualities to the space, the various strategies of enrichment are applied to the space to induce a feeling of arousal.
Arousal:

Figure 5-37 explains the overall arousal control plan in the whole store. The various enrichment strategies being adopted here are:

Complexity:

As mentioned earlier that the design features that add complexity can be anything from lines on the walls to a heavy articulation of the surface (Rengel, 2003). Complexity can be produced firstly by surface articulation and another means is surface overlapping.

The surface articulation of the walls of bistro area creates rhythm, pattern and adds textural quality to the wall, thus enriching the visual qualities. Figure 5-38 and 5-39 exhibit the conceptual development of that wall. The degree of complexity induced here is very rich, yet minimal thus taking one the highest order of arousal, but producing a moderate effect. The interplay of solid and voids and use of different materials along the main path adds complexity and also makes the entire transition through it engaging. The openings on the bistro as well the artists’ workshop wall provides some visual relief while moving along the main path. Thus this besides adding complexity adds to the visual qualities to the main path thus making the transition engrossing.

Surface Overlapping: A project is considered to comprise of ceiling, floor plane and furnishings and interior wall, thus these components overlap to produce a final composition. As shown in figure 5-40 manipulation of the vertical heights interior wall planes. Figure 5-34 exhibit the floor plan of the floor thus by introducing inclined lines adds much needed complexity to the entire space.
Figure 5-38: Surface Articulation of East Wall of Bistro

Figure 5-39: Surface Articulation of South Wall of Bistro

Figure 5-40: Surface Overlapping and Articulation of the Wall of the Corridor Wall
Novelty:

Spatial novelty can be produced by the nature of individual masses and elements in space and their shapes, and also by their combination into specific arrangements. Thus in this floor the unique shape of the wall on east as discussed earlier as well as the reception desk adds novelty to the space. Figure 5-41 and 5-32 exhibit the conceptual development these two spaces.

Another important component that adds enrichment to the project is the enrichment when in transit. While designing the main circulation path most of the elements were taken into consideration to make the path interesting and enriching the movement. The floor pattern, suspended lights to bring down the scale of the main path, interplay of voids and solids, modulation of surface of the side walls on the side of the path and most importantly views at the end makes one absorb more in the surroundings and produces an state of alertness and arousal. Figure 5-42 exhibits conceptual development of that.

Based on this component Figure 5-36 indicates the final floor plan of basement level of the Opera House. The floor finish and reflected ceiling plans are also developed and are exhibited in Appendix. The interior elevations and sections are exhibited along with the proposed views are also exhibited in there.
Figure 5-41: View of the Blank Wall at the Basement Level

Figure 5-42: View of the Main Path
RESULT OF THE CASE STUDY

The purpose of this case study was to apply the proposed framework to the design application. The design analysis and design development are conducted based on the framework. Pleasure and arousal are considered the key determinants of emotional responses of subjects in the retail environment. The concept of pleasure is associated with the physiological comfortable situation. In a pleasant situation, an intermediate arousal level is hypothesized as the most preferred level. The arousal qualities hypothesized in controlling environmental stimuli are complexity, novelty, boldness and enrichment in transit.

The proposed framework seems to be useful in the process of design analysis and design development. First, in the design analysis, the framework was helpful in identifying the potentials and unique strengths of the project. These strengths were identified and plan for pleasure was developed based on that. Further complexity, novelty and enrichment of the route guided the author to manipulate the form, color and materials and lead to the plan for arousal.

Second, the framework was useful in controlling the design elements as a whole. The concept of intermediate arousal level was useful in balancing the individual design elements.

Third, the case study reflected that the framework can be useful to enhance creativity in a design process. Particularly, it can be seen when one tries to enrich the project as these parameters can get sometime abstract. The case study reveals that the framework can become a guideline that help designer to find creative solutions in advance. The study also reflects that the framework encourages a designer to consider all the possible environmental characteristics to enhance the emotional shopping experience of customers in a store environment.
Further, the developed design is presented to the design committee of the Warren Opera House to learn whether the design developed on the basis of the framework was effective in inducing the emotions of pleasure and emotions and learn about their behavior response to it. Since the size of the design committee is very small, thus an informal questionnaire and the presentation were made as interactive as possible. The questions were in form of yes and no answer and participants could write a narrative description which the author will analyzes further.

The questions were divided into three sections- Reception Area (the Arrival space), the first floor retail area (destination space) and the basement bistro area (second destination space in the building). In each section the first part of the questions concentrated of effective application of the program to create a pleasing scheme. Happy, relaxed, pleased and satisfied (on the basis of PAD scale) were the dimensions used to learn about pleasure. The second part concentrated on the spatial quality enhancers and whether they were able to induce the emotional feeling of arousal. Stimulated and excited (on the basis of PAD scale) were the dimensions used to learn about arousal. Further the behavioral responses i.e. their intentions of approaching the space, exploring it, staying in it and returning back were been asked.

The redesigned space was presented to them in form of four well designed boards, which comprised of floor plans, reflected ceiling plans and the flooring pattern. It also had the interior elevations, computer generated 3D views and the interior finishes that the author proposed for the space. E.E Warren Opera House had hosted an exhibition for International children painting competition. The boards were displayed there along with the other exhibit so that the committee members could read and absorb the design. The board met ten days after that and the author made a presentation. It was small group of group of eleven people.
The questionnaire was handed to them and comments were made by them were recorded and the entire presentation sessions was made as interactive as possible. The outcomes of the questionnaires are discussed in the conclusion chapter and the implications and ideas for further research have been discussed.
CHAPTER 6: CONCLUSIONS

The goal of this thesis was to propose an adaptive theoretical framework explaining the relationship between the environment stimuli and the emotional response in a retail-mixed use environment. In this final chapter the objects and the results of the thesis are summarized and evaluated. First, an overview of the research procedure is summarized. Second, a summary of the proposed framework will be presented. Third, the result of the case study is discussed and finally the conclusion and implication for the further research will be talked about.

Objects of the Thesis:

The basis of this thesis was that the emotional experience in a retail environment is important and can be primarily induced by atmospherics, based on the following assumptions:

1. The emotional experience can be predictable in a retail setting, and positive emotional responses are important for enhancing the consumers store choice decision.
2. Environment characteristics can induce and control certain emotional responses.
3. Design development is a subjective thing, a framework does exist, and it can guide the designer to create predictable spaces.
4. The MR Theory is a promising theory for the research on the environmental-consumer behavior aspect.

Research Procedure:

This research was conducted as an integrated study based on grounded theories. Three main bodies of literature were reviewed. First, the importance of shopping experience
in relation to the physical environment was discussed. Second, the relationship between the
store atmospherics and emotional response was reviewed. The theory which formed the basis
of studies was the MR theory. Previous researches done in environmental psychology and
business researches based on MR theory were studied critically. Third, a review of literature
in the typology of design factors based on the theory given by Rengel and Kevin Lynch was
conducted.

Integration and synthesis of grounded theories was attempted, based on the critical
analysis of researches done on this subject. First, redefinition of the terms used in MR theory
(environmental stimuli, pleasure, arousal and behavioral responses-avoidance and approach)
was established. Second, analysis and integration of researches based on MR theory was
done and a framework for the purpose of the study was established. To make this framework
applicable for design purposes, an in-depth study of design factors was done and was
integrated with the above emotion-human interaction framework.

The proposed framework was then applied in actual design process as a case study. The
EE Warren Opera House, located in Greenfield, Iowa was used as a case study. The
design process was conducted on the basis of the framework and an in-depth interview which
was conducted with the committee members to learn history, culture, program and objectives
of the EE Warren Opera House. The framework was helpful to enhance the creativity in a
design process and provide guideline that helped the author find creative solution. It was also
helpful considering characteristics to enhance the emotional experience of patrons in a retail
setting.

The proposed design was then presented to the committee to learn whether the
framework was successfully manifested into the space and to learn about the emotional
outcome of the redesigned space. There were a group of eleven respondents. An informal questionnaire was handed over to them and the session was made as interactive as possible.

**Results of the Case Study:**

**Reception Area – Arrival Space:**

The questions concentrated on layout and spatial qualities of the space, whether these induced to the feeling of pleasure and arousal respectively. As a group they thought that the segregation of services on one side and the reception and lounge seating on other was effective in maintaining the traffic flow and created a pleasing scheme. *This provides a great definition to the space commented one of the respondents.* Thus, the respondents felt happy to see the space, it was successful in inducing an emotion of pleasure.

The spatial qualities like dropped ceiling to create intimate spaces, articulation of the walls, introducing panels to hang paintings about the building, place and art exhibits created visual interest. The engaging graphics on the walls were a reminder of past. The waiting lounge was considered a great node where one can feel relaxed (pleasure). The juxtaposition of new element like glass with the old panels to create the reception desk was considered to be an excellent idea and added novelty. They all responded positively that they were stimulated in the space and would like to explore it more.

Arrival space according to Rengel (2003) gives visitors first impression of the building and project and is an important transitional space from immediate outside and between itself and rest of the facility. Thus, results of case study show that it was able to fulfill that and stimulate the respondents to explore the place.
Retail Area – First Floor

The questions in this part too concentrated on layout and spatial qualities of the space, and eventually their emotional response to it. The respondents liked the way functions were segregated in this scheme with the jewellery and painting which need more circulation space on one side and gift shop with bookshelves and deli seating on the other and deli being the focal point. To everyone it created a pleasing and an interesting scheme (feeling of pleasure). The deli seating made intimate by introducing the bookshelf, accent colors and gift display would be a relaxing (pleasure) place to all of them. Another space which everyone would like to sit was the window seating in the deli area.

The floor pattern, display cases and the view of the deli at the end made the entire transit through the main path visually interesting and made them want to explore the place more. The space quality enhancers like articulation of vertical surfaces, curved deli counter at the end, unique shape of the gift display, jewellery display area with dropped ceiling and pendant lights stimulated them to stay and explore the space more. The respondents thought that all the earth tones colors of interior finishes chosen blended well with the building. They provided a good background to some of the accent color walls and colorful display of art work. The respondents were stimulated and excited with the way space was been designed and would like to spent their time in their and would like to return back to the space.

Though, some suggestions were made by the group. First, the display cases to have a glass enclosure so that the visitors don’t touch the antique art work enclosed within. Second, the jewellery display to be made more visual and accessible by introducing the front panel of glass. These things would definitely add fine details to the space and should be considered for further research/design.
**Basement Level**

The three arrival spaces to the basement level – first, from the street level through the landscaped corridor, second, from the elevator and the staircase which opens into the cash register and third from the first floor level from the east end which opens into the blank wall which has been treated with a curved bulkhead, reveals, down lights and signage on it has way finding cues were been liked by them. All three of these points of entry have unique characteristics yet are all very inviting.

The two destination space in the space was the bistro and the artist’s workshop which was very legible. The layout of the bistro was legible, flexible and very pleasing. The lounge seating created a nice relaxing node which everyone thought they would like to spend time at. The bar was a pleasing space too and would like to spend more time here. The space enhancers like the glass display shelves, the suspended wood ceiling, design of the bar table added further interest. The visuals on the walls made them want to stay in the space for a long time.

The wall to the artist’s workshop was unique and appealing to everyone. The entire journey through the main path with the treatment of walls in a unique way, flooring pattern and the suspended lights enhanced the space and made them very excited (arousal) about the space. They liked the fact the integrity of materials was maintained and the finishes selected just enhanced and added more life to the space.

Some suggestions made by the group were that the bars counter needs some down lighting to make it more interesting. The cash register served as a point of interest to most of them and acted as a landmark but the need to it was been questioned. Some respondents suggested that the bar space can serve as a cash register too. Thus, those are more
management issues need to be resolved and accommodated on the programmatic level. Some of the respondents were not sure about the nature of the openings of the bistro towards the corridors. They suggested more informal openings like taking few bricks out rather than such a structured one. This, the author felt can be another option. Lastly as a group they suggested adding some storage to the artist’s workshop which would add lower and upper cabinets for storage.

The suggestions which group made would definitely add more visual dimensions and detail to the space. Other than that they unanimously thought that the layout was pleasing and legible one. The architectural features enhanced the spatial quality and stimulated them to browse the space, spent time there and would surely like to return back to the space. “I am very pleased with the integration of contemporary materials with the past materials. I like that the ideas are feasible and easy to maintain as well as there is flexibility of usage. It is a thoughtful and careful consideration of space and good research has been done to create such an emotionally responsive space” wrote one of the respondents about the space. They further added that they are pleased with the results, as this case presentation would help them raise funds and the drawings can be utilized to write grants.

**Conclusions and Implications**

In this thesis, the author attempts to understand the holistic picture of ‘design factors’ (one of the most important categories of the environmental stimuli) and human emotional relationship. The M-R theory was integrated with theories from the business literature and the interior design to develop a framework or guideline to understand this relationship. This was further applied to the case study.
The case study reflects that this proposed framework had a significant potential as a guideline for the designer in the entire design process. It helped identify the strengths and weakness of the existing design of the retail mix use space for EE Warren Opera House. It was relevant to control the design composition in advance and was an important tool in the design process. The creativity was not impaired by the use of the proposed framework.

To observe the successful application of the proposed framework, the redesigned space was exhibited to a group of eleven respondents. An informal questionnaire was distributed and the results indicate a successful application of the categories of functional layout to create a cohesive, legible and pleasing scheme inducing an emotion of pleasure. The spatial quality enhancers like novelty, complexity and articulation of transit to enrich it further stimulated the respondents further to remain in the space, explore it more and had a desire to return to it. The group made suggestions to further add details to specific area which should be taken under consideration for future research/design and will further enrich the design. There were some conflicts in the programmatic level which needs to be reconsidered as well. The author proposed preliminary color scheme which the respondents liked. Thus, for future research they can be delved into more as interior finishes are an important component of design.

To conclude, the framework helps in understanding of the influence of design factors on emotional response. The effect of two dependent variables arousal and pleasure in relation to the design factors are defined in the framework. These can be further investigated and refined. The framework reflects a great potential for further research in the interior design as well as marketing fields. The marketers as well scholars can survey the quantitative research on the design factors and the human interaction. The framework can be utilized in
the design education in development of creativity. The case study on the basis of the feedback can be developed further and the area which needs more study is the interior finishes part.

Thus, the author is convinced that the study would bring a new insight to academia in the interior design field and can be expanded in the interior design research area significantly.
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REFERENCES CITED


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