

How the elements of architectural design, color, lighting and layout of a Quick-Service Restaurant Image (QSRI) influences perceived value, customer satisfaction and revisit intentions

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Abstract

A restaurant's interior and exterior design can have an enormous influence on customer's perception of value and satisfaction, which in return can influence their revisit intentions. The purpose of this research is to unfold the key elements by which a Quick-Service restaurant image (QSRI) influences *perceived value*, *customer satisfaction* and *revisit intentions*. Previous research has looked into all the different components of image (eg. *Store location, food quality, menu variety, professional appearance of staff, price and cleanliness*) that make up a successful restaurant. But one question that has been left unanswered concerns on how people judge the exterior and interior design of a restaurant and decide to take action to go visit the place. Thus, our purpose aims to fill this gap and solely focus ourselves on the elements of architectural design, color, lighting and layout of a QSRI and determine what is needed to succeed in this area.

We will use field experiment and survey of restaurants in Taiwan to empirically validate the proposed hypothesis. We argue that an effective image management brings in a competent marketing strategy; therefore we expect that our findings will help restaurateurs determine what is needed to succeed in terms of design. The Quick-Service Restaurant Industry has been dominated by titans that have successfully been able incorporate the elements of design, food and service. Our research seeks to reinforce the area of design and inspires upcoming businesses to give them a clearer path on how to succeed in establishing a QSR.

Key words: Quick Service Restaurant Image (QSRI), Color, Lighting, Layout, Perceived value

Introduction

Taiwan's food industry is a very competitive one. Proceeding from a eating culture, many different restaurants have been established in order to fulfill the huge demand. At the same time customers have been increasing their demand for higher quality food preparation and taste, better healthy choices, superior customer service and more value for their money. Taking this into consideration, restaurants compete in all the possible areas, ranging from food, to service to experience.

In accordance to a study conducted by the USDA (United States department of agriculture) (Fu, June 2012), Taiwan is one of the countries with high food consumption culture on the world. As a result the number of restaurants in Taiwan have shown true significant growth and despite the recent economic turndown, the Taiwanese food service sector has expanded nearly 13% to 12.3 Billion USD from 2008 to 2011. Moreover, this growth has also been reflected on the number of food establishments, which have from 68,462 stores to 78,822 in within the same years.

In order to attract more people, restaurateurs have devoted a lot of focus to the restaurants interior and exterior design. Critical importance has been devoted to this area as it is considered to be the main initial physical perception that customers encounter; which leads to determine the consumer's behavior.

As humans, we are constantly playing the role of detectives, looking at our surrounds of visual inputs in order to consciously and unconsciously make judgement towards things. In particular, the element of color, lighting and layout in a restaurant shape the elements in order for them to be perceived in a certain way.

Food is definitely a part of our everyday life, as busy as we are with our everyday tasks, we seek to for places that are convenient, fast and effective when it coming to choosing a place to eat. When seeking for variety or looking to try new places, there is no intangible input upon which we can judge, there is only the tangeable element of the external and internal design of the restaurant for us to judge. From this point, we judge only upon the design of the restaurant and unconsciously create our own expectations of the service and food quality that they offer. Good exterior and interior design does not necessarily imply the restaurant's service and food quality will deliver an overall satisfying experience, however, been this the only factor available for us to judge, there is no other option for us but to rely on it.

Looking into the design elements of a restaurant, when comparing big corporations versus small scale or recent startup restaurants, the big corporations clearly have the initial advantage due to the fact that they have the economical resources to hire great designers and implement an attractive and inviting interior and exterior design.

The purpose of this research is to reinforce this area and develop a framework (in terms of color, lighting and layout) that gives existing and upcoming restaurateurs a clearer idea of what is needed to successfully implement an inviting interior design and allow them to attract customers into their business. At the same time, the findings of this research will allow small scale and low budget startups to compete with the big brands and allow them to attract customers and further retain them through their food and service quality.

1. Understand how customers evaluate a fast food restaurant and what impulses them to approach it.
2. Explore how the elements of Color, Lighting and Layout can influence this evaluation and be manipulated in order to positively affect the attitude of customers.
3. Conclude with design recommendations that can be easily implemented in any fast food restaurant.

2. Literature Review

2.1. Fast Food Restaurants

Fast foods restautants are also known as QSR (Quick Service Restaurant) in within the industry. In accordance to (Baraban, 2010) a Fast food restaurant is simply a food service business that emphasized on fast food cuisine and minimal table service. Food served in fastfood reataurants is typically categorized as non-healthy and offers a very limited amount of options in its menu, typically ranging from 4 to 10 items. Talking in terms of the delivery chain, the fast food restaurants always cook their food in bulk in advance and keep it hot until it is served to the customers, in order to ensure its quality. The food in most cases is already packed and ready to take away, even though a seating area is provided in most cases.

The preparation process in within this category is carefully planned in order to minimize the amount of steps and for it to be executable by practically anyone without the need of any special skill.

2.1.2 Restaurant Image

The important aspect of image has been receiving increasing attention in the marketing literature. Research has been seeking to evaluate what makes a restaurants image successful, by the fact that the way that the customer sees a place ends up affecting its individual subjective perception and consequently his behavior. Due to the complex nature of image there are numerous definitions to it, but one that most closely defines it was stated by (Brinberg, 1997) as:

“The sum of ideas, beliefs and impressions that people have of a place or destination”.

In a previous research conducted by (Brinberg, 1997), a tourist behavior model was created in which destination image and other evaluating factors (ie. Trip quality, price, route, perceived value) were taken into consideration. The results showed that destination image appeared to have to most significant effect on behavioral intentions, leading people to make a decision and take the trip. In the cases in which the destination image was very attractive, customers ended up relying on this input of information and getting emotionally exited, which in most cases ended up leading them to engage and purchase the tourist pack.

Relying on the previous point as a backup statement, it is argued that this concept can be applied to a restaurant scenario in which people judge by how they see the place, engage in an evaluative process and decide whether or not to visit the place.

2.1.3 Creation of an Image

In the restaurant industry case, in accordance to (Berry, Feb. 2007) there are 3 main clues that diners use to judge a restaurant experience:

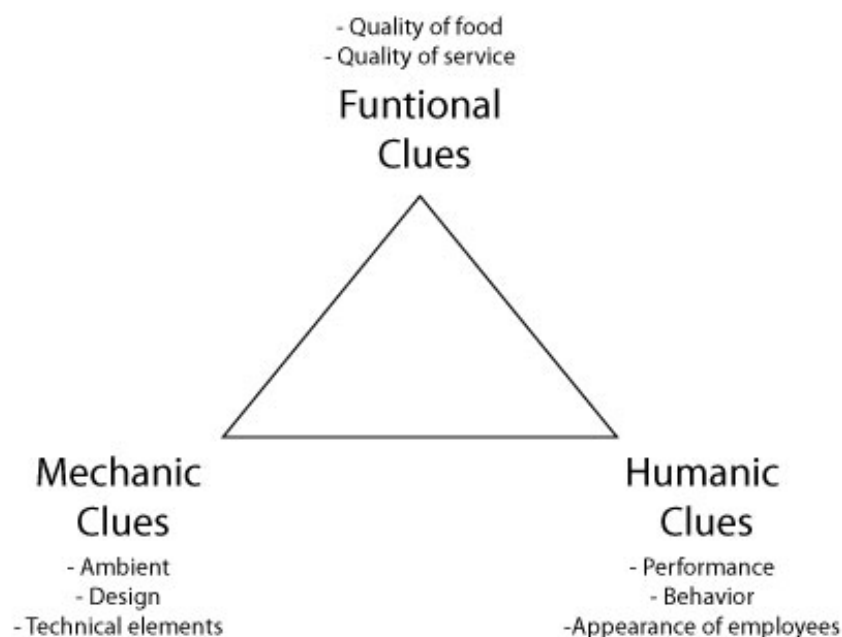


Table #: The three elements to judge a restaurant experience

Dinning at a restaurant is a multi layer experience that is broken down into the 3 main elements that were just previously mentioned. Each of these elements influence upon the customer in a different order and end up accumulating to simultaneously create an overall impression.

Without a doubt, the functional clues are considered to be the most important ones, since food is the base of any restaurant. Therefore (Berry, Feb. 2007) carried out a study in which they set aside the functional clues and relied on the mechanic and humanic clues in order to find out how these two elements work together in order to deliver a satisfying restaurant experience.

Their findings show that customer's expectations of a restaurant service were found to be more significantly higher when mechanic clues were positive than when they were negative. Suggesting that mechanic clues are the initial spark upon which customer's judge and help to define what to expect from the service. However, they then proved that humanic clues are more important than mechanic clues in determining the customers final assesment of a restaurant. Moreover, they stated that when both clues (mechanic and humanic) are experienced together, the mechanic clues seen to have insignificant effect on service quality perception. These findings support our research since they state that the mechanic clues are the very first elements that influence a customer's perception.

2.1.4 Environment Perception

Previous research has supported the notion that customer’s attitudes and behavior are influenced by the interaction and perception of environmental elements. These elements have been referred to as the “Servicescape” (Bitner, 1981), Bitner argues that the concept of servicescape can help to define how people react and see certain elements and evaluate them all in conjunction to create a personal conclusion. Bitner breaks down the servicescape into two main categories that can be applied to any service setting; these are the “Facility Exterior” and the “Facility Interior”.

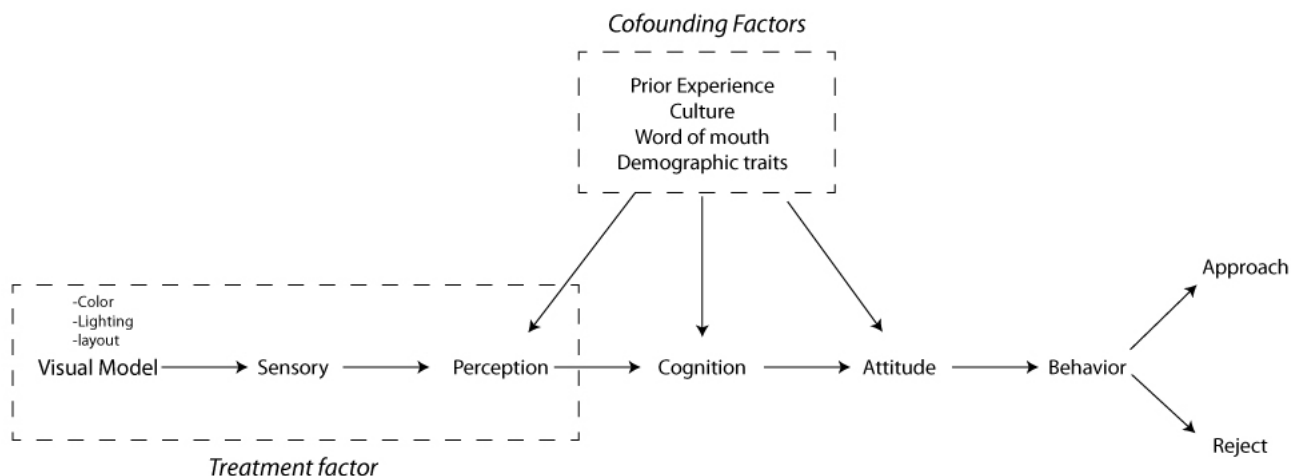
Facility Exterior	Facility Interior
Landscape	Interior Design and Décor
Exterior Design	Equipment
Signage	Signage
Parking	Layout
Sorrounding Environment	Air quality
	Temperature and ambiance

The elements of a Servicescape

Bitner predicts in accordance to her findings, that if this case were to be applied to two restaurant scenario in which food and service quality are the same, but the established servicescape is different, people still will still experience higher quality from the restaurant that has the most optimal servicescape. Therefore implying that the perceived image of a restaurant will influence on how people judge and feel towards the place.

Moreover, the finding from another study conducted by (Tor Wallin Andreassen, 1998) claim that the store image is believed to generate a Halo Effect on satisfaction judgements and attitude towards the service firm. That means that onces customers have a favorable attitude towards and Fast Food Restaurant Image, they are most likely to be satisfied with the service provided. At the same time, they also found out that image significantly influences customer satisfaction, quality and loyalty in within a service context.

2.1.5 Revisit Intention Attitude

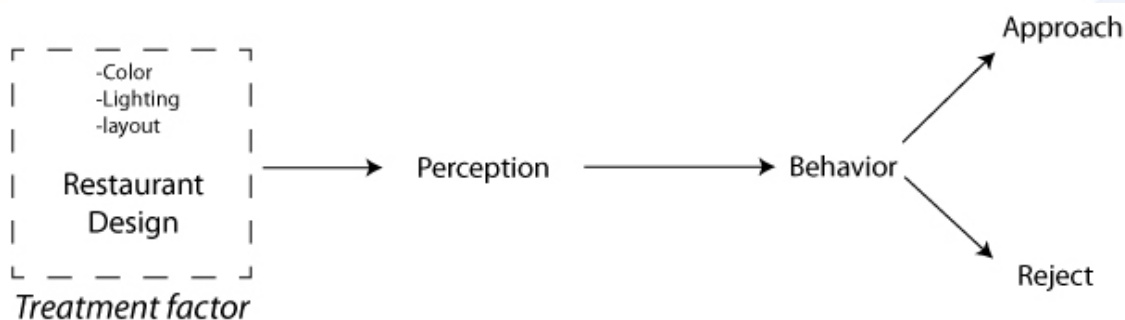


Attitude Process

The graph above shows the general process through which customer perceives a restaurant in order to generate an attitude towards it and decide whether to approach or reject the place. In the case of our research we will be manipulating a 3 Dimensional models and focusing on the visual elements of Color, Lighting and Layout of the interior design of a fast food restaurant. As it can be noted on the graph above, the first initial spark that triggers and calls out the attention of customers is the appearance of the place, this is what we call the “treatment factor”. From this point on, the customer can experience 2 processing phases, he can either perceive the restaurants image directly and develop a “Approach” or “Rejection” behavior or her can perceive the restaurant image, get influenced by the “Confounding factors” and generate a final a “Approach” or “Rejection” behavior.

To get a more clear idea of these 2 embedded concepts, the graph above can be broken down into two simple ones. If we carefully look into how the decision process takes places upon customers, we could break down and categorize customer into the 2 mayor forms of information processing and knowledge ordering (Connor, Egeth, & Yantis, 2004):

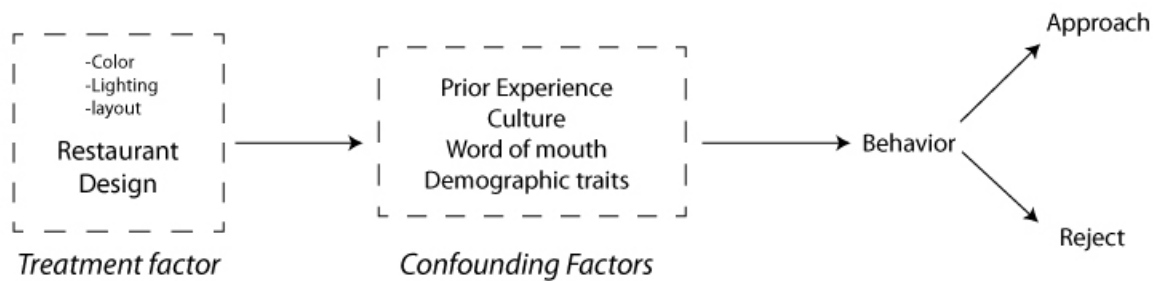
1. Bottom-up effect (Intact)



Through this category, the customers approached the target by essentially breaking down what is set in front of him/her in order to gain insight. Talking in within the context of the restaurants interior, the customer looks at the restaurant and judges

upon the elements that make up the image. He then creates his own expectations of the place and decides weather or not to approach the restaurant.

2. Top-down effect (Influenced)



This category is made up by the piecing together of different sources of knowledge in order to make up a final judgement. In within this case, the treatment and the confounding factors play supporting roles and affect the final decision. The customer's firsts recalls previous experiences of fast food resturants, word of mouth. Amongst others and starts to piece together a final image in conjunction with the restaurants design.

Taking this into consideration, throughout the first stage of the methodology we will seek to break down the interviewees into the categories of "intact" and "influenced". This will allow us to point out which interviewees are actually judging the restaurant solely by its design, and which interviewees are been influenced by their previous experiences and interaction with other fast food restaurants, their culture or their demographic traits.

INTACT	INFLUENCED
	- Prior experience
	- Culture
	- Demographic traits

To do this, throughout the first stage of the methodology, specific questions are going to be formulated in order to allow us to see if certain fast food restaurants and their composition elements have influenced a customer to the degree where he will be bias when judging another restaurant. Later on the same interviewee will pass on to stage 2 and will experience the different 3D simulations in order to see their perception judgement towards what they see.

2.2 Hypothesis Development

2.2.1. Color

In accordance to these 2 previous studies the most optimum colors to implement in a fast food restaurant in order to attract the attention of customers would be warm

colors. By the fact that the common circumstance in which a person looks for a fast food restaurant is to grab a quick snack and not waste much of their time. Therefore everything has to be quick, consise and straight forward; people are not seeking to sit down and relax while enjoying long meat.

However, other studies suggest another implementation of colors. A study conducted by (Bellizzi, Crowley, & Hasty, 1983) argues that stores designed with cool colors were preferred over stores designed with warm colors. It is important to point out that this study was made in within the context of retailing stores. Moreover, agreeing with the previous statement, (Yildirim, Akalin-Baskaya, & Hidayetoglu, 2007) carried out a study on the interior color of a café and concluded that using purple (cool color) in the interior was perceived more positively that the yellow color (warm color).

Basing ourselves on the 2 previous points, the recommended optimum color for an interior design are cool colors, specifically in the case of cafes and retail stores. As we can see, there are contradictory studies of color that have been done in within different contexts.

It is important to point out that these findings have been conducted in within the café, hospital or workspace context; not within the context of a fast food restaurant, and therefore there is still an unanswered question of which colors are the most optimal to implement when designing a fast food restaurant. These previous studies can help as a guide to predict which elements of color are going to be the most efficient to attract people to fast food restaurant.

Reseacher	Findings	Context
(Stone, 2003)	Warm colors = focus people outwards Cool colors = turn people inwards, focus, mental tasks	Office
(Stone & English, 1998)	Warm colors = stimulate feelings cool colors = calming properties	Work space
(Bellizzi et al., 1983)	Warm colors = least preferred by customers cool colors = more preferred by customers	Retail stores
(Babin, Hardesty, & Suter, 2003)	Warm colors (orange) Cool colors (blue) + affect shopping decision	Retail context
(Yildirim et al., 2007)	Warm colors (yellow) = perceived neutrally cool colors (purple) = perceived positively	Coffee shop
(Valdez & Mehrabian, 1994)	Warm colors (long wave length) (yellow & orange) = Neutrally cool colors (short wave lenght) (purple & blue) = perceived positively	Effect on emotion
(Carter, 1983)	warm colors (red) = make objects seem closer cool colors	Conferene room
(Camgöz, Yener, & Güvenç, 2002)	Bright colors - increase attractiveness Dull colors - neutral *blue preferred over any other color	Background color

(Naz & Epps, 2004)	Neutral colors = sterile and boring Warm colors (red) = high level of attractiveness Cool colors (green) = relaxing	color emotion college students
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The table above complements and shows other color researches that have been conducted and the respective context in which they were held. As we see there are many opposing statements upon color, mainly due to the context in which they were held. Due to the statements that warm colors (specially red) focus people inwards and stimulate them inwards, the following hypothesis was developed:

Hypothesis 1: Customers attitude towards the servicescape will be positively affected by red and its analogous colors.

2.2.2 Lighting

Previous studies have focused on the effect of Lighting and color in within an interior, however, each of there were studies independently. A study was conducted by (Hidayetoglu, Yildirim, & Akalin, 2012) in which they evaluated the color and lighting independently on the interior of a hospital in order to determine how the variety of these element help people to guide themselves throughout the hospital. Their findings showed that warm colors facilitated recall of space and orientation, and that normal to strong lighting (250lx and 500lx) were preferred in comparison to soft lighting. The implications of this study state that for further research these 2 elements can be examined together in order to prove their relevance; moreover it is also stated that since light and color go by hand, 3D images that they used to text viewers were not closely related to reality, since lighting will affect how a certain color is perceived. Thus, the following hypothesis was developed:

Hypothesis 2: Customers attitude towards the servicescape will be positively by affected the interaction of red color and by strong light intensity (250lx to 500lx)

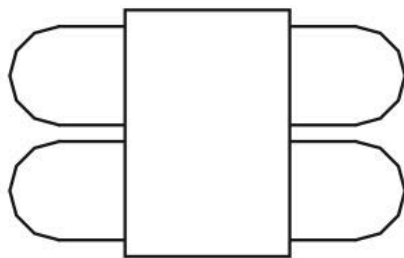
2.2.3 layout

Previous studies have been conducted on table layout to find out how their functionality can be exploited, to test out their efficiency and to test the spending per minute by each customer. How people behave and allocate themselves in public settings has received a lot of attention, and it is stated that in order for people to focus on the task in hand, they need to feel comfortable and not constrained by the environment (Guyot, 1980). The location in which they seat and the seat in within the table that each has affects the interaction of the customers.

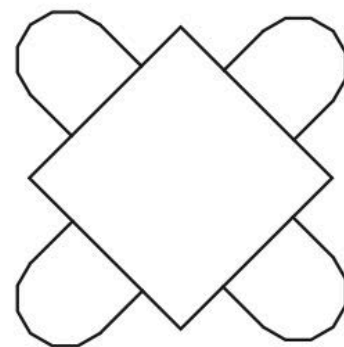
A specific study was conducted in which the duration, average check, and revenue per available seat-hour. This study seeked to understand the way the table type and location affected the amount of time and money spent, in order to allow restaurant operators and designers to develop facilities that will assist in

revenue maximization (Kimes & Robson, 2004). Throughout their study they included all the basic types of seatings and the impact of anchored and unanchored tables and tested their outcome on a real restaurant setting.

Their findings show that in terms of 4 people-seating configuration, there was no significant impact on their amount of spending. This in turn gives us the advantage of testing these 2 kinds of layout in within the fastfood restaurant and see how they impact the visual perception of customers. Moreover, their findings also showed that people sitting as banquette seats were having longer durations and lower average checks. This finding generated the recommendation of using freestanding tables, specifically for restaurant designers who seek to adopt better layouts that generate shorter consumption time. Taking these 2 specific findings as a reference, we base our 3D rendering layout on them.



**4-TOP
(Face to Face)**



**4-TOP
(Diagonal)**

Variation in Four-Person Seating Configuration

Due to the fact that our study only seeks to test the impact of layout perceptive values, we will not be moving tables around and testing their perceptive value in different locations, we will only test the impact of the 2 form of table seating configuration shown above. Thus the following hypothesis was developed:

Hypothesis 3: Customers attitude towards the servicescape will be positively affected by the interaction of red color, strong light intensity (250lx to 500lx) and diagonal seating configurations.

Methodology

Stage 1

This first stage will seek to unveil specific demographic criteria from customers that will later serve to classify them and see how different groups respond to the alterations on color, lighting and layout. As mentioned previously the main categories

that we are seeking to differentiate are “*intact*” and “*influenced*”, which will allow us to see which people have been influenced by previous encounters with fast food restaurants, their own culture and demographic traits. This in return will allow us to see how this factor affects the attitude and perceived value towards the different scenarios.

A specific questionnaire will be developed to unveil specific criteria, such as preferences for colors, previous experiences, nationality, etc. Stage 1 and 2 go together and are going to be conducted in a Quantitative form, once the data is collected it will be verified through an ANOVA process. In terms of sampling, there will not be so many requirements apart from the following:

Sex: Male and Female

Class: Students / workers

Specific life experience: Fast food restaurant customer / Non-fast food restaurant customer.

Stage 2

Using 3D modeling program Cinema 4D we will elaborate a realistic model for the interior of a fast food restaurant. This software will allow us to create realistic renderings in which we are able to control to color, lighting and layout in a numeric form, which means that we will have full control over the variables. This in turn will also let us compare the specific measures with the response and attitudes of the customers.

Color Control

In within the fast food 3D modeling, the predominant colors of the scene are going to be defined in Decimal Codes [R, G, B (0,0,0)] in order to ensure accuracy of colors.

In order to make our research more accurate, we will design the interior of the fast food restaurant with one single predominant color in within the scene, and differentiate among each scene by choosing warm tones, cool tones and neutral tones.

Lighting Control

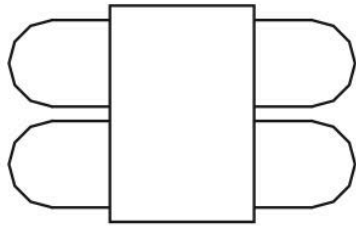
As a main lighting source, there will be globe lamps hanging from the ceiling 210cm from the group with a common distance in between each of them of 1.5 meters. These main light sources are the ones that are going to be manipulated and altered in intensity. Once our findings are revealed, the future restaurateur can implement this same model to the size of his restaurant.

This is due to the fact that we need to take into consideration that the more lightbulbs there are in within a place, the more Lumens there are gonna be in the room will become brighter.

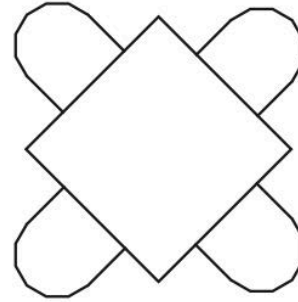
Layout Control

In order to ensure consistency and be able to achieve a recommendable table setting that future restaurateur can implement the findings of this study, we will not be moving the location of tables in with the 3D model. The tables will be all spaced apart evenly with a distance of 1.5 meters in between. Each table is going to have a four person-

seating configuration and in the only thing that will be altered is the angle in which they are placed.

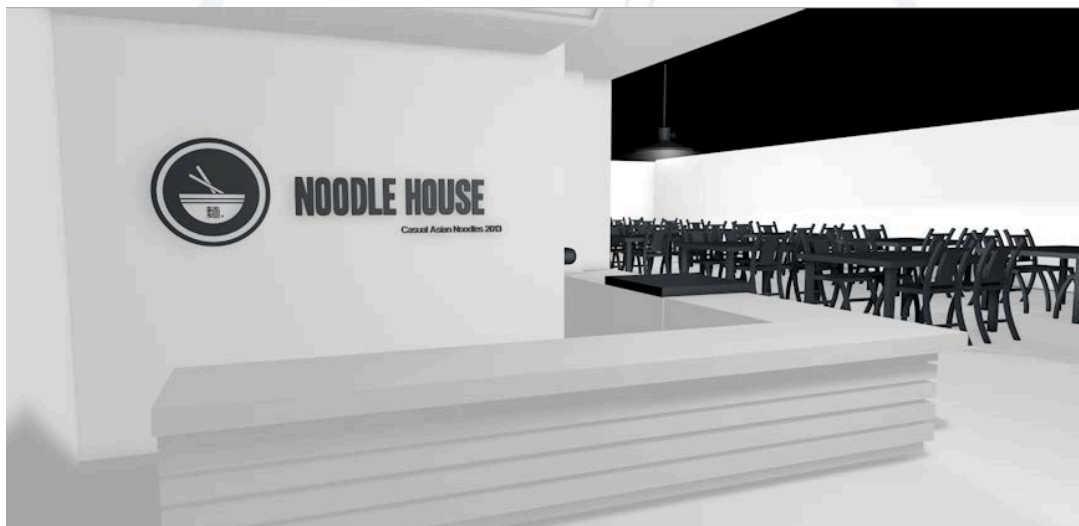


**4-TOP
(Face to Face)**



**4-TOP
(Diagonal)**

Variation in Four-Person Seating Configuration





Stage 3

Currently 2 restaurantenurs have agreed to be intervieweed and give us insights into the experience that they have acquiered throughout the years.

Name: Aplus Chefs Menu

Years in Operation: Since Feb. 2013

Number of employees: 9

Restaurant Category: Casual Dining

Address: 大安區安和路一段 33 號, 台 北

Name: Aplus Dining Sake Bar

Years in Operation: 17 years

Number of employees: 15

Restaurant Category: Casual Dining

Address: 仁愛路四段 105 巷 3 號, 台 北。

The indepth interviews wil give us indepth understand to the design of restaurants from a more managerial point of view. Their experience will also give us insight into how these elements affect customers.

Preliminary Study

A small preliminary study was held in order to see how people judge the restaurant when they see it for the first time. Customers were randomly chosen in the outside of fast food restaurants in interviewed upon their experience and thoughts of the looks. A sample of 7 people were interviewed and the table below shows a quick summary of the findings:

	Interviewee						
	P1 Name: Cindy Cheng Age: 28 Gender: Female Occupation: Master Student Interview place: Mc Donalds	P2 Name: Edgar Diaz Age: 24 Gender: Male Occupation: Master Student Interview place: Mc Donalds	P3 Name: Jessica Tsai Age: 23 Gender: Female Occupation: English teacher Interview place: Subway	P4 Name: Jeannie Tsai Age: 21 Gender: Female Occupation: Master Student Interview place: Subway	P5 Name: Sharo Li Age: 24 Gender: Female Occupation: Master Student Interview place: Mc Donalds	P6 Name: Yolanda Gabriela Prince Salinas Age: 28 Gender: Female Occupation: Master Student Interview place: Subway	P7 Name: 莊曉蓉 Age: 24 Gender: Female Occupation: Sales Representative (Vivid Holdings Corp.)
Q1 Visit Frequency	1-2 per week	3-4 per week	1-2 per week	2 per week	1-2 per Month	4 per week	1 per week
Q2 Reason to visit	Social time	Quick snack	Quick snack	1.Social time 2.Price	Leisure time	Quick Snack Social Time	Social time
Q3& Q4 Noticed elements (in order of importance)	1. Lighting 2.Seating	1. Lighting 2.Seating	Overall image	1. Lighting 2.Seating	1. Seating 2.Color 3.Lighting	1. Lighting 2.Color	Lighting Color Seating
Q5 Receptive to light change	Yes	Yes	No	Yes	Yes	Yes	Yes
Q6 Receptive to color change	Not sure	Yes	Yes	No	Yes	Yes	Yes

Through content analysis from these interviews we found out that customers do actually notice color, lighting and layout as a whole. And when choosing a place unconscious decisions take place more heavily than conscious decisions, meaning that in most cases people are not totally aware of why they actually approach or reject a place. The third finding clearly showed that people are influenced by their previous encounters with fast food restaurant and tend to unconsciously make bias decision and expectations when visiting a place.

Moreover, in terms of perception of elements in within the restaurant interior, all the interviewees showed to have focused on the seating arrangement and seating type, suggesting that they would feel more comfortable in one kind of seat in comparison to another.

These findings support our developed methodology and show the need of a 3D realistic rendered interior design in order to test the variety of elements (color, lighting, layout). The next step of this research will be to carry out the research methodology, which will be conducted in the upcoming months. Findings are expected to be published in June 2014. For the full paper, please contact us through the e-mail's stated on the first page.

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