

Design Elements Affecting the Using of Atriums in Shopping Malls in Erbil city

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Abstract



Open space represent one of the most important aspects of urban environment which affects our life each single day and usually people have a good relation with them, and

as there are an outdoor open spaces there are also inner ones that usually people involve with it most of time, Atriums represents one of these spaces which consider large covered central courtyard acts as an attraction area where humans interact & communicate with each other as gathering place ,relaxing ,galleries and exhibitions.

Shopping malls owns such spaces which acts effectively when it described in two ideas; business success and architectural success. The research will focus on the architectural success by specifying the occupational efficiency of atriums, although previous literatures covered many architectural aspects of these atriums but, the research noticed weakness in the relation between architectural design factors and users in atrium, regarding physical factors and occupational efficiency which declare as a density of using atriums in Malls that have been explained in two parts (Theoretical and Practical).the research focus on analyzing five malls in Erbil city.

Key Words : Atrium, Design Factors, Occupational-Efficiency, Shopping Malls, Users.

1. Introduction

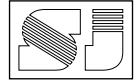
Many peoples nowadays have gone to malls either alone, within friends or families for different activities such as shopping, entertaining or spending the time in a coffee shop, users will spend more than two hours but others aren't stay more than one hour, here the study will try to sight the main factors that made the mall as an attractive place to encourage users staying for a long duration which by this, success of mall will

be measured, good occupation and using different activities.

Shopping mall is an important building that has its roots in ancient outdoor bazaars, hence the shopping malls that we know today were birthed in the beginning of the (20th) century grew to cover the major cities in a few different organized retails such as big bazaar, hypermarkets, supermarkets, and life styles stores appeared to fulfill different needs. Shopping mall, center, arcade or simply (mall) is one or more buildings forming in a complex of shops with walkways enabling visitors to easily walk with parking areas and indoor traditional marketplace, malls will be the fashionable, dynamic that satisfies requirements of customers ^[18]. Today malls play a main role in the life style of people living in cities which has massively changed the patterns of shopping activities. People believes that malls are best place to shop or hang out more than it is place for social and recreational activities, it will be a collection of various retailers and commercial service providers within a well-planned, designed as a building or group of buildings ^[14].

A shopping mall can be said to be a privately owned public space that designed to return financially the investor concern while at the same time it serves as a recreational and shopping for the public and its design principles applied to enhance its Success which will be described in two main aspects:

Business success - renters occupying investors asset assuring the investor in profit making and Architectural success - which is public acceptance of the space that has been created for users. ^[24], so the research will try to seek about the second aspects in order to explain atriums factors in malls as an attractive open court. According to IDECK; a shopping mall is a building which contain retail units with intersecting walkways



enabling visitors to easily walk from unit to unit ^[12].

Boundy's (2000) suggests that today's culture expressed mall as temple to be visited regularly which has converted shopping into a comforting ritual ^[4], so malls defined as a large enclosed building complexes containing stores, restaurants, businesses and facilities serving the general public as pedestrianized shopping areas with enclosed walkway ^[24].

So Mall is public open spaces that have cover walkways with retail shops that act as a social iterating and shopping place that family could attend to.

1.1. Research question

Why do some Malls use more? Does this phenomenon have any relate with designing malls?

1.2. Research Problem

For the last few years many Malls have been designed and built in Erbil city some occupied with different kinds of activities that could work as an attractive space for users to be one of the important places which they attend nowadays. There is differentiating in success of using malls meaning one mall could be used more than the other, so the main research problem will be (There are no obvious idea about Malls Designing elements and its effect on using malls in Erbil city) in order to explain the main problem, research should solve some secondary once;

- a- There is a lack of clearness in mall accessibility.
- b- Disconnection between vertical and horizontal access & its relation with Atrium.
- c- Weakness in applying some of design factors in Malls Atrium.
- d- Lack of services in malls

1.3. Research Main Goal

The research main goal is (to achieve the general frame work about designing Malls through designing an attractive public space in Mall and providing the basic design requirements for the inner court (Atrium). that had the ability of insuring shopping, entertainment and social activity for Malls Users in Erbil city

1.4. Research limitation

Research will focus on the Architectural design factors as shown in research hypothesis only, it avoid the entertainment facilities , marketing and other issues

1.5. Research Hypothesis

To reach the goal of the research the statement below should be realized: -

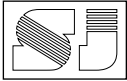
There is a significant causal relationship between efficiency of occupation in Malls and physical design factors which are:

- 1- The area of the mall.
- 2- Accessibility inside the Mall.
- 3- Design principles of Atrium in Malls.
- 4- Services of the Mall.

Through a functional module whenever physical design factors changed, efficiency of occupation will change correspondingly.

2. Literature Review

Too many researchers have been explained the idea of shopping centers and malls as a point of attraction for people in each city. Kuria...; observes that whereas people shop they meet, converse and make friends, he explained it as an ideal center which provides physical living requirements for a community and fulfills cultural, social and recreational needs, to makes a significant contribution for better living ^[19]. Bellenger and Korgaonkar...; established that a large proportion of retail shoppers are recreational once who look for recreation as the key take-away, hence retailers and mall developers should attempt to make shopping an entertaining experience ^[1]. While Oakes, Kwortnik, Yan, R.N. et al. and others...; focused on the physical environment including the performance of building design, indoor air quality, lighting, level of noise and crowding in shopping mall ^[25], White and Sutton...; described a mall space and its characteristics as a social and physical environment that includes the provision of sense of order, safety and security that people need ^[35]. Ndungu...; in his study explained that malls should be as an attractive point in the city and it will not be just a place for shopping but as entertain attractive place that you can stay there for a time ^[24]. Ajay Kumar...; have found that the performance of the shopping mall depends on maintaining the customer relationship



management, shopping mall structure, mall designing, mall management, target market, ambiance and mall environment to generate the income and progress ^[18], also Lee & Johnson; shows that among the factors that may be recognized for the success of malls is the being as family activity centers that contain theatres, food courts & other activities ^[21]. Along with customer satisfaction is the key factor in knowing the success of any mall in order to get customer satisfaction. Therefore, for a shopping mall to be successful, it needs to have a quality of recreational facilities, from creating a social environment where shopping and recreation can be combined into one enjoyable exercise.

3. Research Methodology

Methodology for this research summarized by discussing shopping malls and the factors that effect on the staying more in it ,then focusing on Atrium and its Design factors (Architectural aspects ,form, space, Elements of Form and Space, Characteristics of Atrium in Malls)in theoretical framework. While practical part of the research discusses history of Erbil Malls then focusing on case study by choosing shopping Malls in Erbil City, (Family mall, Majidi Mall, Tablo Mall, Mega Mall and Royal Mall). Data collections have been done in two methods:-

First: (Physical data collection) refers to the collection of data that concern physical design factors for each mall, some of these factors could be measured by using Auto-CAD.

Second: User's data collection; this refers to occupational efficiency of malls submitted in two processes; Questioner to public people to indicates Mall's Reputation and Visiting manager of each Mall for getting information about Malls usage during the time of peak occupancy which is mostly of the weekend by Mall's security gate control. Then reviewing findings, conclusion and recommendation.

4.The History of Shopping Malls (Early Markets)

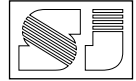
Shopping has always been there since man learnt to exchange goods and services. The earliest form of shopping was conducted in open public spaces alongside other public functions and activities such as, the ancient Greek Agora which is integrated with other daily activities like cultural functions, entertainment... etc. If the history of shopping mall traced back to the earliest enclosed complexes for trading goods, then the early bazaars of Asia cannot be left out, one of those is

the Isfahan Grand Bazaar in Iran, it was a largely covered market and dates back to the 10th century AD., another example of an early covered market is the Grand Bazaar of Istanbul which was built in the 15th century AD., this still in existence today and contains 4,000 shops and 58 streets, to be one of the largest existing covered markets in the world today. In Europe, England, the Oxford Covered Market opened on 1st November 1774 and is still working. ^[24].

Gottdiener...; summarizes the mall as an architectural form that dates back several thousand years to the Mediterranean cities several hundred years ago, a fully enclosed that is quite massive in scale built as a grand bazaar of Istanbul, and this form consists of an enclosed area of separate shops integrated by pedestrian walkways, public and semi-public mini spaces, ^[11]as cited in ^[10]. During 1920s and 30s, early shopping centers were developed in California within a groups of stores surrounded by parking areas. The golden era of the shopping mall construction was from the early 50s to the late 60s, department stores began to organize in centers, and about 10.000 shopping centers of every size and shape had been built by the end of 60s ^[11]. The malls look inward, turning their back on the public street like a suburban house which rejected the sociability of front porches and sidewalks for private backyards, on the other hand, whereas Islamic bazaars and Parisian arcades reinforced existing street patterns, malls-pedestrian already splits urban landscape from suburbs , so open public spaces began to appear in low rise, horizontal forms of the centers reversed the tightly vertical order of traditional urban space ^[6], showing that it is very old function that has been born within people and their daily need for living.

5. What is Mall

A shopping mall can be defined as a complex that includes several retail stores, restaurants and other businesses with a common interest in motivate sales which managed as a single unit; these malls offer private off-street parking facilities. ^[24]. Shopping malls are not only centers of buying, but also highly organized social spaces for entertainment, interaction, and other types of excitement ^[24]as cited in ^[22]. The basic function of the shopping mall is to create an environment where business can take place, and people come into malls for other reasons beyond their basic shopping needs in to create an environment where the shopper can exchange money for goods and services. People have to be able to come to



shopping malls, stay there for certain duration, long enough to take experience, for that shopping mall is a building that encloses several businesses with interconnected walkways allowing shoppers to move from shop to shop, parking should provide within buildings, this will operate by having a magnet store which acts as the main attraction which is mostly a supermarket that people always use and need ^[24].

It is clear that malls can be understood as the intersection of two distinct structural principles; one is the materialization of the retailer's intention to sell consumer goods at a high volume under present day and distribution and the physical space within which individuals come to participate in a certain type of urban environment which they need. Langman...; explained three characteristics of mall; The first, is being an enclosed gathering space isolated from the outdoor. The second, within its boundaries, everything is controlled to create and display a world of fantastic images. The third, which is the place of amazing contrast of time ^[11] as cited in ^[10]. Malls therefore are a place for a business establishment referred as a shopping place which provide entertainment recreation facilities deals with both social and physical aspects of environment in a for attracting people, that means Malls will work as link between factors and people to be attractive for them, for that why this research will explore some important design factors to find out what is the most suitable design for Atrium to be attractive in shopping malls.

6. The Enclosed Malls

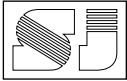
In the 19th century with the use of glass and steel enclosure systems, new opportunities for creating new types of interior places were expanded. Architects have a chance to design and build spaces completely protected from the weather allowing the visual transparency and daylight availability of exterior spaces. Gallerias, conservatories, exhibition halls, train sheds, indoor markets and gardens are all designed to increase opportunities to develop a public life ^[11] as cited in ^[2]. The enclosed shopping mall as we know it today originally regarded as a community center where people would converge for shopping, cultural activity, and social interaction, which is due to the need of providing of shopping spaces free from adverse weather that the covered shopping mall slowly evolved, this covered shopping space gave the shopper a relaxed environment where they could shop in peace,

without the bother of traffic, away from cold, rain or heat, and due to the provision of these relaxed spaces, the shopper could now compare prices and make decisions without haste, from the careful analyzing of the different products on offer. Shopping malls are not only a physical place but also gathering places which offer social relations ^[15]. On the regulations book for the shopping malls in Saudi define the commercial complex as the big closed bazar which is usually contains big building that have more than one floor and many of commercial activities, entertainment, restaurants and fast food, usually named as Mall ^[37]. So role of shopping as a public activity in urban life has been an essential social question which that debated throughout the history, in spite of pollution, traffic and fear of crime, one of the major activities of the pedestrian is shopping in urban areas. Hence, shopping has never lost its value in the process of city growth and development both in closed and open areas. Indeed, the purpose of shopping Malls is not only to provide shopping but also to entertain and relaxing and as a social gathering place that is protected from the outdoor environment to be the enclosed Mall ^[11].

6.1. Aspects of Enclosed Malls

According to "I.C.S.C.," (International Council of Shopping Centers) ...; shopping center is group of retail and other commercial establishments that is planned, developed, owned and managed as a single property, typically with on-site parking provided ^[14]. Center's size and orientation are generally determined by the market characteristics of the trade area served by the center, which have become an integral part of the economic and social fabric of their communities ^[26]. In order to understand the strategy of shopping mall development, it is necessary to identify the physical elements within its structure, for that five strategies have been categorizes in design process of shopping malls; First all activities in malls are turned inward; they have blank walls on their outsides, and the department store can be seen from the parking lot in order to break the monolithic pattern of bricks and steel. Public space replaced by the design of the mall to create a self-enclosed and regulated environment.

Second feature is to welcome shoppers as they enter the main area, so entrance will be large open area like a town square, with some forms of special attraction which is not directly related to shopping itself.



Third dedicate an important amount of space to fast-food restaurants that are often grouped into (food courts), such spaces are located with a seating area combined with plants and maybe fountains centering on a large area filled with light from skylights, the availability of snacks and fast food is an essential characteristic of the Malls.

Forth shopping mall is being open space of social relationship as a public space that well-ordered space. Except the places designated for hanging around, pedestrians are discouraged waiting within the mall in contrast to the public space ^[11]. Fifth characteristic is the sign systems which are found in shopping mall. Desire is attached to particular brands, logos, signifiers, so shoppers enter the mall for buying specific brands and types and for that even before the shopper enters the mall, the process of shopping begins in this commercialized social environment ^[6].

6.2. Factors effect on staying in Mall

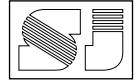
Many factors have been identified in order to make mall as an attraction point for users in an entertainment place not only for shopping, shopper's excitement and desire to stay at mall could be identified in four factors: ambient factors, design factors, layout, and variety. Each one composed of multiple aspects represented by different statements. Some of them covered in included architecture and overall design, temperature control, variety of stores, music, comfort in locating stores and lighting. These influence the desire to stay at Mall ^[34]. El-Adly...; identified six factors determining mall attractiveness from shopper's perspective; these were comfort, entertainment, diversity, mall essence, convenience, and luxury ^[7]. While Venkateswarulu and Uniyal...; proposed a set of factors they found that attractiveness of a mall depends on appeal and convenience, amenities and atmospherics, ambience, personnel, parking and seating, they also suggested some new ones like restrooms, parking, security and size of stores ^[31].

Sang-lin Han...; mentioned three main factors that make the Malls as an attraction place, design factors, ambient factors, and social factors, then he elected the design factors because it is more visible form the ambient factors and it is more controllable than social factors ,design factors; space of moving, view of watching. ^[29]. For that research will indicates some factors of all that could be useful in raising the level of Mall; design factors, Atrium design, occupation efficiency, staying on mall and using of spaces, Accessibility

which shows the paths that people use in Mall, and service.

7. Malls Atrium (Open Court)

Atrium is a very old idea dates back 2000 years ago as a grand entrance space, focal courtyard and sheltered semi-public area have been used in a large-scale building, in retail shopping malls and office buildings ^[33] It is one of the most widely used systems that integrates exterior and interior, and could be explained as covered pedestrian spaces add to the inventory of public spaces available to pedestrian, joining inside and outside and enriching the urban space, these useful urban design elements are central for the cities which try to enhance pedestrian life and combine the indoor place with the outdoor space ^[2]. Atriums have become successful solutions in commercial buildings when large spaces are provided for various purposes in multistory buildings. They often enveloped with large glass wall and roof areas provide sufficient day lighting in a complex connecting of heating, cooling, and ventilating, the stratification of air, problems with indoor air quality, acoustics, and control the environmental systems. ^[17]., this element regarded as an extraordinary building feature other than common slab-by-slab design, where floor slabs on several stories are cut through in the middle so that a void connecting those stories could be created. Atrium building is carries some special characteristics which appeal building designers and owners attention though frequency of application is rather high with trend of increasing ^[33]. Atrium supported and organized the flow of the daily routine as a dynamic space in every sense, and the elements used to construct and decorate the atrium were placed in an integral mode to define and visible the desired spatial shape and view of the architectural volume that made up the center of Mall ^[5], and in order to achieve this all vertical and horizontal surfaces or planes such as walls, floor and ceiling in atrium were articulated with a technology development, atrium has turned as modern envelope composed of steel, glass, and reached higher and wider indoor space, hence modern atrium is able to apply greater impact ^[27], in order to be one of the most dynamic elements, the key point in the city structure, the path between two important destinations, attracting people and enriching their movements inside, enhancing the quality of the urban public space. In order to explain atrium, research will explain where this space comes from.



7.1. Architectural aspects of atrium building

As research mentioned that atrium is one of the aspects of some buildings like Malls for that many aspects of this important space should be added to be as connection space;

- 1- Sheltered space with amusement, like galleries and exhibitions, dining area adjacent to atrium, could provide a place for gathering.
- 2- Act as a cultural center by holding activities such as musical performances and shows.
- 3- Atriums will not only offer spatial quality but also visual connection to all activities taking place around it, include all the ways and areas in different floors that can be achieved^[33].

So Atrium will be a circulation key point, which guides routings of different user groups while provides space for relaxing at different levels.

7.2. Form

Form; is an important design component in conceptualizing the initial idea of a project for an architect composed by number of complimentary design themes such as proportion, rhythm, repetition, stability, and unity, in order to realize the role of form in design process it is important to get the relationships between elements of architectural form which can be observed in reference to points, lines, planes and volumes^[30]. The importance of form in a total image of architecture considered as one of the visual design components such as location, color, and texture which used by architects to produce the desired message of a building, also composed with three design elements: line, plane and volume which are the visual components of architectural form^[16], in other way form is architectural design concept examined in a series of compositional rules, qualities and principles, such as unity, symmetry, balance, proportion, contrast, and scale in combinations of architectural design^[36], that's meant these represents & creates architectural form in any building if it is inside or outside, so form in terms of both visual and symbolic characteristics is indeed the essence of design in architecture and considered as the creation of a building's physical and visual shape in relation with the building's practical, social and symbolic functions with its design components, so one of the main parts of creating an attractive Atrium is to focus on form.

7.3. Space

It is the part which completes form as the basic component of design in architecture. The distinctive characteristic of architecture from other forms of art deals with three-dimensional organization space, which includes man^[13], and in order to give the sense of space and create spatiality architecture needs not only the form-giving elements but also other design themes and concepts, pattern and sequence are two significant components in creating a spatial composition. Pattern is a combination of repetitive elements and sequence composed of linear perception of elements has characteristics that relate them and amplify their differences. Pattern and sequence are used to create a hierarchy that defined as priority given to some spaces over others within a building^[30], so space is a three dimensional expanse of architectural design to fit with its different classifications as physical, conceptual, behavioral, external, and internal with its boundaries and proportions as outcome of architectural design that made use of form and its giving elements, and both of form & space could effect and made up the space that the people will stay.

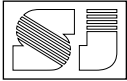
7.4. Elements of Form and Space

These two terms form & space could work together as an attraction point in malls showing some elements to explain it relations with the Atrium. Architectural language includes the primary tools that make form and space as the prime generator of form that indicates a position in a space; line as point extended and organized with properties of length, direction and position; plane as the line extended and organized with properties of length, width and surface^[8].

Design tools give the essence and shape the form to organize the outer boundary of an object which can be identified as the form giving design elements that create the sense of space enclosure and separate the physical activities and spaces from each other, then space will be left between the planes is the reason for an architect to create an enclosure in order to contain, for that people will stay^[30]. Elements, planes boundaries will work together to create the space that people uses and stay for a time with a lot of entertainments.

7.5. Characteristics of Atrium in Malls

Atrium as an important focal point in shopping malls as;



7.5.1. Attraction; Attract people to use, stay and have a lot of social activities in.

All elements of mall design-limited entrances, escalators placed only at the end of corridors.

Fountains and benches carefully positioned to attract shoppers control the flow of users through repetitive corridors.

The overall floor plan is defined by their location and the specialty shops are placed between the big stores and the number of large department stores determines the classification of malls.

There are usually at least two big department stores which orient the mall's paths on a linear axis and allow designers to make mall attractive, people have to walk from one to other due to the location of two stores at opposite ends, hence, by this design strategy, shoppers pass all the minor known shops between two stores ^[6], although shopping mall should be transformed into community space by making it more open as a place to meet, walk and sit in order to provide a social atmosphere which is safe, inviting and as secure as possible for all ^[11], this could be achieved through the adaptation of specific measures that research will explain in the practical part. These attractions are the key element for success of shopping malls and they will be a natural locations or features, objects, or man-made constructions that have a special effect on people ^[28]. Malls are being built with large entertainment centers including rides, skating rings, amusement parks, movies, theaters, and museum, as competition increases entertainment seems to be becoming an even more important part of the retail scene. A good mall is like a good man it offers entertainment and excitement ^[9], so retail environment that creates heightened experience and pleasure lead to higher levels of buying it does not take much of a logical leap to conclude that the same should hold true of malls which their environment create heightened experience and pleasure that lead to higher level of buying ^[23]. Ridgeway and Nelson analyzed factors that shows in mall behaviors as an entertainments explained five over six factors emerged underlying the structure of the shoppers in malls were entertainments that related to; eating, browsing socializing, movies, exercise socializing, found that only (45%) of activities were shopping related, more than (50%) of all activities in the mall could be considered entertainment [3], so shopping malls which are protected places begin to act as public places although they are privately owned areas, and if designers and architects consider the principles of public places as a setting for public life, then

pedestrian environment in the city can be easily formed as one of the attractive point for them, although owned an attractive setting in it to be as research mention before, in one of the most important feature in any city, Malls.

7.5.2. Points of gathering (occupation in malls)

In order a mall to be have a well good reputation, means people will use and stay in it more than others, so there are four different characteristics in Shopping Mall experience that drive shopper satisfaction and will be used more and stay;

Discovery: that means mall should offer a variety of stores and restaurants, with unique products and interesting special events to be pleasing and environmentally sensible.

Comfort: mall is clean, well maintained and safe, washrooms plentiful easy to find and very good sanitary.

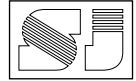
Navigation: should be simple to find the mall from the street, when mall layout easy to navigate with clear signage, people will be more comfort in using it.

Accessibility: plentiful parking showed applied and suitably location ^[32]. The most important element that effect on the using of mall and raises its reputation is Discovery that what the research applied in practical part showing types of function that used to be the main attractive feature in mall.

7.5.3.Points moving (Accessibility & Circulation)

Shopping malls attract huge crowds of people, they need to move freely both horizontally and vertically, this is necessary so as to enhance comfort and feel safety as one is going about their business inside shopping mall, such factors like window shopping 1 inside the malls make it necessary to take care to accommodate the window shoppers without blocking the paths for those that use the circulation spaces as connections from one point to another, if this is not done, the window shopper isn't comfortable when doing window shopping in a squeezed space, while at the same time the passer by feels that path is too tight. These are some of the negative factors that might keep away shoppers off some shopping malls, but bring them back over and over again to others.

Lee and Johnson (2005) look at the effects of shopping behaviors in retail design and recommend five factors that are the most importance in design of retail space, three of these factors are under circulation within the shopping mall, they are: -



Transition Zone; it is area where the customers slow down their step to look at goods on display in the store, it will be the shopper's landing strip, the size of the store determines the size of the transition space, this slows down shopper and get to look at the merchandise on display, before deciding where to go within the store. The Interfere-Brush Effect 2:

each customer has personal space, the time he entered makes him feel uncomfortable when one is crowded they become annoyed and more often not leave without buying what they came for, annoyed shoppers do not stay, in fact they often leave before buying what they came for thus, enough guiding room for shopper should be created which reduces the Interfere-Brush Effect making them more comfortable this is mostly achieved by the use of wide walkways.

The sidelong shelves³:

mall designer should attempt to maximize the shopper's views of goods and suggests the idea of sidelong which is basically tilting the display shelves at an angle, such that they are not in the traditional (90) angle, this ensures that more of on the shelf is visible to the shopper at a given time. The other two are also important in the success of any mall space, circulation to and from them should also be clear, easy to find and this makes them more or less part of this analysis on circulation.

Seating Area; makes the shopper feel that mall cares for them a chair says: we care, it should be provided in strategic areas for shoppers to rest, wait for their partners, watch goods on display, how other shopper are treated by the staff and how others shop, this makes shopping a social activity.

Dressing Rooms; enough thought should be put into design and location of these facilities, should be well furnished with mirrors and hooks for shopper's clothes and also easy to find.

The longer a customer takes before finding a dressing room, the less likely they will make a buying, these facilities should also be placed in areas where they do not overstep on other shopper's privacy ^[24].

- 1- window shopping: the activity of looking at the goods displayed in shop windows, especially without intending to buy anything, it is where they make the change from being outside the store to being inside.
- 2- The Interfere-Brush Effect: prevent a shopper activity from continuing or being crowded.
- 3- sidelong: directed to or from one side; sideways.

8. The Practical Part of the research

This part discusses and analyzes research methods that used in order to recognize hypothesis of the research and achieve its goal.

8.1. History of Erbil Malls

For the last few years many Malls have been designed and built in Erbil city as followings:

Majidi Mall: is one of the best shopping malls, it was the first one opened doors to visitors in Nov.23.2009. Located on Koya Main Street to the east of the city with 3 floors over a land of "20000m²".

Family Mall: one of the greatest malls opened its doors in Dec. (2010); it located on the east of Erbil city on the 100 m streets. It is 3 floors with a big play ground, family fun over a land of "120000m²".

Tablo Mall: is one of the beautiful Erbil Malls, opened its doors in (2012), and located on the south of Erbil city on Kirkuk Street, with 4 floors over a land of "12000 m²".

Royal Mall: this mall located on the north of the city in the intersection of pirmam with 60m street opened its door in 2013 with 6 floors over a land of "5000m²".

Mega Mall: this mall opened its doors in (2014) and located on the North of Erbil city on the Pirmam Street, its 5floors over a land of "18500 m²".

8.2. Study Process

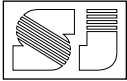
Five Malls in Erbil city (family Mall, Majidi Mall, Mega Mall, Royal Mall, Tablo Mall) have been selected as a case study depending on the main standard criteria over the theoretical framework, data collection had been done in two methods as following:

physical design data collection; This refers to the collection of data that concern physical design factors for each mall, some of these factors could be measured by using Auto-CAD such as; area of the Mall, proportion, location of Atrium and its Area, others can be measured by observation through designing malls such as Accessibility & parking, as shown in (Appendix 1).

User's data collection; this refers to occupational efficiency of malls submitted in two processes;

Questioner to public people to indicates Mall's Reputation as shown in (Appendix 2).

Visiting manager of each Mall for getting information about Malls usage during the time of peak occupancy which is mostly of the weekend



by Mall's security gate control as shown in "Table I".

8.3. Data Collection Analysis

Data collection can be illustrated in three simple ways:

- 1- Using Architectural drawings for malls to show the physical design factors as in (Figure:1).
- 2- Explains physical design factors of malls as shown in (Table 2).
- 3- Using bar chart to show; malls reputation, Density of Using Malls and Users in Mall, as shown in (Figure:2), (Figure:3), (Figure:4).

8.4. Findings (Realizing Hypothesis)

The functional relationship of malls occupancy (Y) with the principles of design factors in Malls (X) can be obtained through a computer programming (SPSS) by choosing linear regression as following; The adjacent [R-Square is (0.93)] which can be represent a high degree of realizing or successful Malls (%93) based on four variables which found in functional model below (see function, 1), research reached the functional model after removing the non-significant variables in (3-stage) one by one, the best model have been obtained in (stage 4) as shown in (Table 3)

The Model should be: -

$$Y=B_0+B_1X_1+B_2X_2 \quad (1)$$

Y= dependent variable

B=constant

X= independent variables

[Mall occupancy = 3061.7+2.47 No. of parking - 2637.2 Percentage of vertical access attached to Atrium+ 0.51 Area of the mall + 18.01 Proportion].

Malls occupancy has a direct (Positive) relationship with (number of parking, area of the mall and proportion) whenever the three variables increased, Malls occupancy will increase correspondingly, while malls occupancy has an indirect (negative) relationship with percentage of vertical attached to Atrium, whenever percentage of vertical attached to Atrium increased Mall occupancy decreases.

9. Conclusion

From the theoretical frame work research concludes:

- 1- Malls originally regarded as a center for shopping, culture activity, and social

interaction which include some attractive functions which is not directly related to shopping.

- 2- Atrium which is a shelter courtyard inside Malls being used in large scale buildings, shopping center and offices, which offers physical and visual connection to all activities taking place around it.
- 3- Architectural and design aspects of Atrium make the malls more attractive and usable.

From the practical study research concludes that

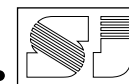
- 1- The adjusted R-square of (Y) Malls occupancy is (0.93) which mean (%93) based on four variables among the principle design variables which are; No. of parking, percentage of vertical access attached to Atrium, area and proportion.
- 2- Mall occupancy has a positive relation with number of parking, area and proportion, while it has a negative relation with percentage of vertical access attached to Atrium.
- 3- The other factors of principle design which have not been in the functional model of (Y) that doesn't mean it do not a significant relation, but they did not have a linear or causal relationship with (Y).

10. Recommendation

- 1- If designer tried to increase the usage of the Mall, he or she has to increase the number of parking.
- 2- Large Malls are more successful and more reputé because it includes more attractive points.
- 3- Physical factors design of malls have been studied in an accurate way to be a place for social interaction.
- 4- Vertical circulations should be distributed equally through the horizontal access not very attached to Atrium.
- 5- Measuring successful malls can be get through, mall occupancy (Density of using space and mall reputation).

11.Acknowledgment

We (The researchers) offer the finest words of thanks and appreciation to all who helped us in completing this research, which took form us more than twelve months, and special thanks for all our friends and colleagues that helped us in answering the Questionnaire paper and give us the right information that have had a great



impact in supporting the credibility of the research, and a very special thanks for all the shopping Malls Manger to provide a great help in giving information about the Malls that researchers made by the site visit for each mall and more than 4 times for each of the five malls which helps us to support the credibility of the research.

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تأثير العوامل التصميمية على استخدام الفناء الداخلي المسقف في مراكز التسوق بمدينة اربيل

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المستخلص :

يمثل الفناء المفتوح احد اهم مظاهر البيئة الحضرية ، ذات الاثر الكبير في جميع مظاهر حياتنا اليومية ، ويرتبط الانسان عادة بقوه مع هذه الفضاءات كما في الفضاءات الخارجية المرتبطة بهذه العلاقة القوية مع الانسان ، وهناك ايضا فضاءات داخلية ترتبط وتتفاعل مع هذا الانسان في معظم الاوقات .

يمثل (Atriums) احد اهم هذه الفضاءات الداخلية والذي يعد فناء مركزي مسقف وكبير يعمل كنقطة جذب اساسيه في المبني ، يتفاعل فيه الانسان ويمارس العديد من الفعاليات الاجتماعية ويستخدم كفضاء تجمع وراحه وكأماكن عرض وبيع.

تمتلك المراكز التجارية مثل هذه الفضاءات الجاذبه للناس ، ومن اجل انجاح استخدام هذا الفضاء يمكن وصفه بنقطتين وهما : نجاح الاعمال والنجاح المعماري. والبحث هنا يركز على الجانب المعماري من خلال التأكيد على كفاءة الاشغال لهذه الفضاءات الداخلية في المراكز التجارية . ومع ان الدراسات السابقة قد غطت الكثير من المظاهر المعمارية لهذه الفضاءات الداخلية ، لكن هذا البحث يرى وجود قصور في تحديد العوامل التصميمية والمعمارية وتأثيرها على المستخدمين ، مؤكدة على العوامل الفيزيائية وكفاءة الاشغال والتي ستناقش كثافة الاشغال لهذه الفضاءات الداخلية ، حيث تم اثباتها من خلال الجانبين الاساسيين (النظري والعملي) ، ويتناول الجانب العملي خمس عينات من المراكز التجارية بمدينة اربيل .

الكلمات المفتاحية : الفناء الداخلي المسقف ، العوامل التصميمية ، كفاءة الاشغال ، مراكز التسوق ، المستخدمون .

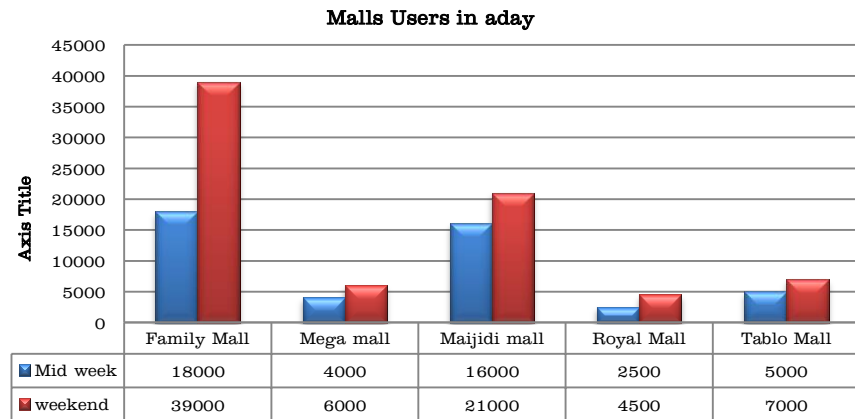
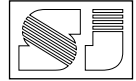


Fig. 2 : Malls users in one day.

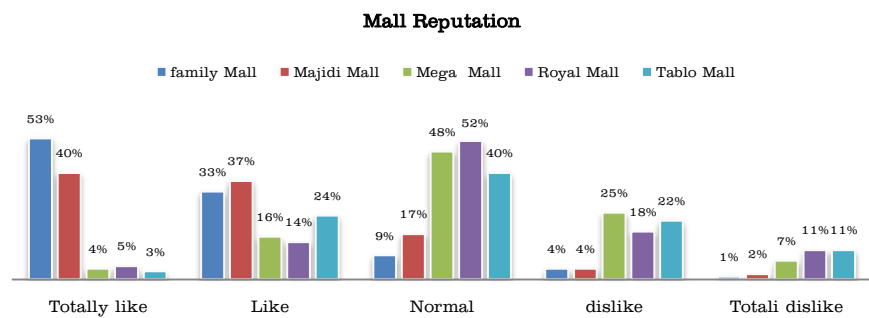


Fig. 3 : Malls reputation.

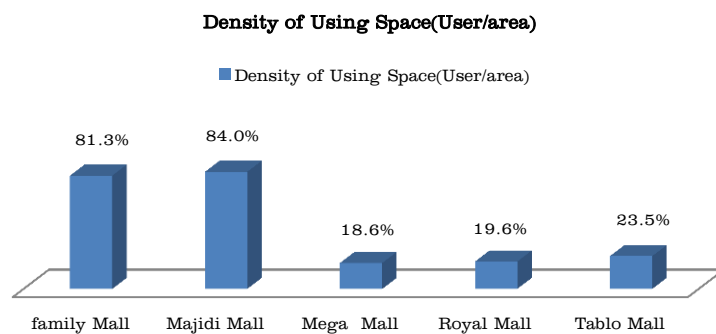
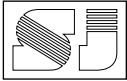
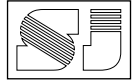


Fig. 4 : Density of using space.



Appendix-1: List of measuring indicators of malls.

Variables	Sub- variables	Indicators	Value
1-Area of The Mall	Area	Area	<input type="text"/>
		Axial Access	<input type="text"/>
2- Accessibility in Malls	2-1 Horizontal Circulation	Central Access	<input type="text"/>
		Up& down in one zone	<input type="text"/>
	2-2 Vertical Circulation	Up &Down in different zone	<input type="text"/>
		proportion	<input type="text" value="X: Y: Z"/>
	3-1 proportion	area of Atrium according to Mall	<input type="text"/>
		Percentage of horizontal access attached to Atrium	<input type="text"/>
3- Principle Design of Atrium in Mal	3-2 Area	Percentage of Vertical access attached to Atrium	<input type="text"/>
		3-3 Atrium Location	
4- Service 4-1) Parking	4-1-1 No. of Parking	No. of Parking	<input type="text"/>
		Open parking	<input type="text"/>
	4-1-2 Design of parking	Multistory parking	<input type="text"/>
		Underground parking	<input type="text"/>



Appendix-2: Malls reputation.

Salahadden University
College of Engineering
Architectural Department

Dear Citizen: -

A very welcome for you....

This Question is for a research which will be a part of Scientific Upgrade, so hope you will be helpful in answering these questions in a accurately and objectively which will be effective in achieving the research goals.

M. Ansam Saleh Ali

M. Lana Abubar Ali

M. Shna Assad Muhammad.

Notes: -

- No need for mentioning your name.
- The answer will be by picking the preferred choices for you.

1-Gender: -

Male

Female

2-Age: -

(18-30)

☐

(30-40)

☐

(40-50)

☐

(50 & more)

☐

3-Study level:-

Illiterate (cant read & write)

☐

Primary

☐

Secondary

☐

Bachelor

☐

Master

☐

Ph.D.

☐

Employ

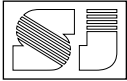
☐

- Q) There are five shopping centers as shown below which represent the most common Shopping centers used by citizens, choose an option (How you like it) according to your desire in using it.

Malls	I totally Like it	I like it	Normal	I dislike it	I totally dislike it
Majidi Mall					
Family Mall					
Tablo Mall					
Royal Mall					
Mega Mall					
Others					

Table 1: Malls occupancy.

	Occupation ((Mall reputation+ Density of using space) /2)	Mall Reputation	Users /Day	Density of Using Space(User/area)
Family Mall	7853.7	53	39000	81.3
Majidi Mall	4249.6	40	21000	84.0
Mega Mall	1209.0	4	6000	18.6
Royal Mall	911.4	5	4500	19.6
Tablo Mall	1610.6	3	8000	23.5








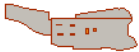


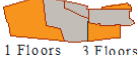





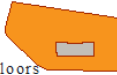


















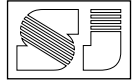
Malls Name	Accessibility			Design Principles		Parking
	Mall plans	Horizontal circulation 	Vertical Circulation 	Proportion of Atrium	Atrium Location 	
Family Mall						 1 Floors 3 Floors
Majidi Mall						 1 Floors
Mega Mall						 2 Floors
Royal Mall						 1 Floors
Tablo Mall						 1 Floors

Fig.1: Architectural drawings for mal.

**Table 2:** Malls physical design factors.

Principle of Malls Design / Independent variables										
Accessibility				Atrium (Open Court) Design				Service		
				Area		Atrium Location		Parking		
Malls	Area m ²	Horizontal circulation Design	Vertical circulation design	Proportion	area of (Atrium) according to Malls area	percentage of Horizontal access attached to Atrium	percentage of Vertical access attached to Atrium	No.of parking	Design of Parking	
family Mall	48000	Axial	Up & Down in diff. zone	1:02:02	0.3	0.15	0.4	2200	Underground parking	
Majidi Mall	25000	Axial	Up & Down in one zone	1:04:02	0.4	0.45	0.4	1500	open parking	
Mega Mall	32250	Central	Up & Down in diff. zone	1:01:04	0.5	1	1	800	Underground parking	
Royal Mall	23000	Central	Up & Down in one zone	1:01:03	0.2	0.7	1	400	open parking	
Tabto Mall	34000	Axial	Up & Down in one zone	1:01:03	0.1	0.05	1	1500	Multistory parking	

Table 3: Functional Model of (Y) Malls occupancy.

M	B	p-value
Number of Parking	2.47	.009
Percentage of vertical attached to Atrium	-2637.2	.011
Area	0.51	.032
Proportion	18.01	.036