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Effective Office Environment Architecture: Finding Ingenious Ideas in a Home to Stimulate the Office Environment

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Abstract

This research intends to explore various issues related to the office environment design and house environment design. Today, given the nature of office design in Khartoum, Sudan, certain arbitrariness has been inevitable. There has been a shortage in the interests, comfort and element of surprise in the office environment. Some studies proved that working at home might increase motivation, relieve stress, and increase employee comfort. Therefore, the study proposes thorough physical and social aspects a comparison between the house and office to uniquely identify and develop a new office environment design. A questionnaire is designed to suggest a possible and promising way of designing an office environment that is similar to the house environment through finding ingenious ideas in a home to stimulate the office environment. The understanding of the comparison between the house environment design and the office building environment design is the key to a clear definition of the architectural qualities of the office building environment. A strategy has been developed which suggests how the comparative results might help consider ideas to be simulated effectively in creating an appropriate, comfortable and satisfied office environment. The ideas addressed by the strategy include architectural qualities such as space planning and collaboration and communication. This overall strategy which contributes to our understanding of the ideas could help create sufficient and satisfied environment to achieve comfort.

Keywords: Office environment, Idea of a house, Architectural qualities, Comfortability, Satisfaction, Stimulus spaces :

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1. Introduction

The feeling of comfort in the office spaces is necessary to achieve high working efficiency. Many studies hypothesis that achieving comfort in our office spaces depends on tangible and psychological aspects. Some studies proved that working at home might increase motivation, relieve stress, and increase employee comfort [16]. But, is working at home a good idea? We should ask this question because there are some differences between the house environment and office environment in terms of their qualities. These differences are the result of tension between living and working [14]. Therefore, it is suggested to look at creating an appropriate office space environment through looking at ideas of a house. The house spaces do not only act as spaces to live but also act as a society that reflects the cultural and civilization properties. Therefore, two aspects of design are proposed to identify the architectural qualities of house environment and office environment. The underling dimensions of the physical and social aspects of the design are identified. What makes the comparative results between house environment and office environment valuable and useful have been highlighted in considering ideas in terms of architectural qualities. These ideas could be simulated in the office environment to create an appropriate office environment. The findings of this paper are significant because they could help treat correlative experiences between the house environment and the office environment. A strategy which suggests how the findings of the comparison results might help consider ideas to be simulated effectively in creating an appropriate comfortable and satisfied office environment has been developed. The ideas addressed by the strategy include space planning and collaboration and communication.

2. The Office Buildings

The architectural qualities of office spaces has been said to have a significant effect on comfort, satisfaction and efficiency. Such office buildings house the organizations they contain. The framework we developed for this paper is to view an investigation of the comparison between the office environment and the house environment so that we could find ideas in a home that can be simulated in office buildings environments. Finding appropriate ideas and concepts to refer to architectural qualities should seek to maximize the particular advantages of the comparison result while trying to minimize the disadvantages inherent in the functional design which is most used today by organizations. Therefore, two categories of analysis are established: the physical aspect and social aspects. These design aspects enable qualitative methods of investigation for analysis of the comparison.

The physical aspect of office environment design is identified through the linkages between specific features of the physical environment and worker motivation, sense of well-being, job satisfaction and productivity. Researchers who have identified these correlations include Becker [17]; Carlopio & Garder [11]; Oldham [8]; Wineman [7]. In this study, the physical aspect looks at the comparison through architectural attributes such as space planning.

The social aspect is identified in the use of shared spaces where the wider working environments are included providing a space for communication and chance encounters. Brill [1] found that spatial interaction can promote communication. B. P. Sunoo [2] tried to integrate social properties with the architectural qualities to help them make sense of the space. In the study, the social aspect looks at the comparison through social interrelationships between spaces.

The office work presents itself with many possibilities. According to Mervi Himanen [13] the office can inspire, energize and motivate its occupants who feel like they are in a second home, a place where they feel like they always belong. The office can also avert burnout, boredom and disillusion and create happiness at work [6]. This research investigates the architectural qualities to evaluate the effectiveness of introducing ideas contained house in the office environment. This investigation would hopefully provide opportunities to change occupants' way working and create a new working environment.

In Sudan today, given the nature of office design, the working culture affects office buildings architectural composition, functional characteristics and then architectural order by organizations. The office space has been designed to suit the working requirements using various types of furnishings and partitions. Today, organizations encourage designers to create an office environment that lacks the architectural qualities, social integrity. This has made certain arbitrariness inevitable. The office environment has been designed as a fundamental space environment. It reveals the usual suspects: poor lighting, inflexible circulation and bad space planning. There has been a shortage in the interests, comfort and element of surprise in the office environment which affect satisfaction and productivity.

3. The House Environment

According to Fay Sweet [5] the home is a hot house of ideas. In the house, we experiment with color and texture, furnishings, lighting and room planning. But these are only a small part of the story. Often missing is the real opportunities to make the most of our living environment, to make it more comfortable, dynamic and inspiring. Living spaces however, should not only try to achieve a comfortable environment, but also try to challenge and adapt appropriate ways to dwell in space [3].

The house spaces do not only act as spaces to live in but also act as a society that reflects the cultural and civilization properties. For this reason it is helpful to consider that house and comfortability has impact upon reflecting different design issues of the house or living environment. These design issues should indicate the architectural definition of the living environment. Vera Martinez [18] remarks that the architectural definition of living environment begins at the position and relation of the spaces to each other (question of quantity) and reaches the design of the public, semipublic and private areas (question of quality). Herman Hertzberger [9] refers to the story of the division of the hall-house that it gives clues to understand how making buildings adapt to the way we like to live. We enjoy open space, but still like to inhabit a mixture of private and social space. Fay Sweet [5] commented about sources of inspiration for space studies that the projects appear in three sections called adding space, reinventing space and making space. He added that the first includes a variety of clever ideas for breaking through the boundaries of the existing space by adding extensions. Reinventing space explores the ways in which architects can reorder and reorganize the home to make the best use of existing space and so tailor the rooms to truly suit the needs. The final section, making space, delves into those underused and dead areas of the home and breathes new life into them. They provide a wealth of ideas and inspiration as well as show how to improve the physical and social qualities of the living space. However, the literature of house environment design indicate some significant design issues such as the building volume, house & community as the basic architectural definition of living environment. Therefore, these design issues are helpful in achieving appropriate comfortability through forming the basic condition of human existence which indicates

the definition of habitation. These design issues could be determined to find ideas to be compared with the physical and social aspects of the office environment.

4. Hypothesis

The office space environment has not yet been looked at through the aspect of a house environment. Most of the problems that are associated with the physical and social aspects of the office space environment are not recognized by designers. Designing an office space environment through the above two aspects is different from designing a workable office space environment. The destitution of qualities of these two aspects of the office environment result in unacceptable office space environment.

The house environment achieves architectural qualities and social integrity. It involves issues such as form, circulation, orientation, space planning, landscape of spaces and shared spaces. However, there is an opportunity to change the view of the dire office environment. Qualities of the house could effectively be evaluated and identified and used as guidance to help create a new distinctive office environment. The research intends to explore the various issues mentioned above and to propose a through physical and social comparison between the house and office to uniquely develop a new office environment design. It suggests a possible and promising way of designing an office environment that is similar to the house environment through finding ingenious ideas in a home to simulate the office environment.

The similarities between the quality of the office and the quality of the house and community can be found when the two types of architecture are compared. Studying the house environment design qualities will allow a comparison between the house environment designs with the possibilities of a new office space environment design. The house qualities that are seen from the physical and social aspects can be considered to compare them with the proposed qualities of an office building. The house is designed to create a controlled environment, flexible space planning and better use of the form and daylight. The house environment design gives a sense of familiarity and friendliness to the spaces [14]. Furthermore, it gives a sense of surprise and injects humor. It also creates dramatic indoor environment. It is a combination of provocative indoor and outdoor environment.

5. Objectives of Study

The objectives of this study are:
A. To determine the physical and social aspects of work environment.
B. To evaluate the effectiveness of introducing ideas from house to office.
C. To make a comparison of the office environment with the design ideas of a house.
D. To propose a different work place environment that achieves an air of excitement and that has an intrinsic social dimension.

6. Research Method

Primary data was collected to conduct a case study which is a way for interaction between designers and occupants represented in connection with the possibilities occupants can find appropriate with them. Data was gathered in the form of questionnaires that were circulated among workers in many office buildings which were located in various areas of Khartoum city. Most of them were in the city centre of Khartoum of whom 119 office buildings occupants responded. The number of buildings was not determined but selected for comparison purposes with keeping in mind the physical and social qualities of

the office buildings design. The respondents answered the two types of questions that referred to the office environment, house environment and integrated questions of office environment and house environment design.

The main topics of the questionnaire of the physical and social aspects of the design which included questions about different spaces, spaces planning and layout, productive and healthy environment, working performance and level of comfort were highlighted. The composition of the office building environment questionnaire survey determined the way to make the office environment more productive and healthy, which influences the building environment qualities in total. That is why the questions not only asked if the evaluator considered the quality of each property of the office building environment as high or low or medium, but the evaluators were also asked to pick from among the alternative factors those, which in their opinion, did influence the total environments qualities. However, the questions of the survey allow occupants to have an individual view on design. Every question asked how the office worker find the influence of the office spaces environment or the house space environment qualities or an environment that combine the two qualities of the two types of buildings environment on the working performance, efficiency and comfortability. The questionnaire was based on ideas taken from some of the documented empirical office environment and house environment design studies and observations of the houses and offices environment design in the respective field sites. A study was done (summarized statistics of all evaluative questions about type of spaces in terms of the architectural qualities and the status of the occupants in the house and office space) to see, if making comparison of the office environment with the design ideas of a house would have an influence on the result or not. The data for this study was analyzed statically using quantitative software SPSS-program.

7. Results of the Study

7.1 Physical aspect: Space planning and circulation

In general, by articulating a space there appears more spaces and thereupon more spatial differentiations. More articulation makes the spaces capacity increase as occupants need for differentiated usage grows and therefore optimal place capacity is achieved.

Table1: Isolation or connection of different office or house spaces functions

	Agree to isolate	**Agree to connect**
Different office spaces functions	68%	32%
Different house spaces functions	51%	49%

According to the survey, 32% of the occupants agree to connect different office spaces functions while 68% agree to isolate different office spaces functions. This finding indicates that the isolation of different office spaces functions are evaluated better for controlling of the functions depending on the interests involved more than the connection between them. It seems obvious that the isolation of office spaces

functions would make the spatial units smaller, making it suitable for a number of small separate groups and accommodate decentralized usage.

49% of the occupants agree to connect different house spaces functions while 51% agree to isolate different house spaces functions. This finding indicates that the isolation of different house spaces functions are evaluated as good as the connection between them. This finding indicates numerous house spaces articulations which could provide a variety of spaces and sub spaces to accommodate different activities. It seems obvious that house spaces could be combined, separated or modified depending on the interests involved. Moreover, the spatial units would be smaller, be suitable for a number of small separate groups and accommodate decentralized usage (isolation) or would be centers of attention and the overall affects more individualizing, be suitable for a single large group of people and accommodate centralized usage (connection). This finding is supported by Herman Hertzberger [9] who argue that articulating spaces are suitable for both centralized and decentralized usage through adopting both the large-scale concept and the small scale concept, depending on how we wish to interpret space.

According to the previous findings, the houses functional performance of spaces over the office buildings is apparent due to numerous articulations. Nevertheless, it is important to consider testing the floor plan for its place capacity which is concluded in:

A. How the way enclosure is articulated seems to be based on the exact balance of enclosure and openness, combination and separation, intimacy and outlook.
B. The concept of enclosing capacity or place quality is concerned with the degree to which a space is capable of being inviting to large or to small groups, depending on its properties and form.
C. The dimension of the places and the degree of openness or seclusion do indeed correspond with the kind of use that will be made of these spaces.

If the houses are good in functional performance of spaces, that is not the case with achieving the optimal space planning because neither the houses or offices are good or bad in determining circulation zones and areas which in all probability would be used or the remaining areas which might meet the minimum requirements of places.

It has been argued that spatial flexibility cannot be discussed without considering the functional performance of a space [19]. This argument could likely be important because articulating enclosures could emphasize the functional performance of a space through creating the volumetric differences in heights, widths and lengths in order to establish planned sequences of viewing positions, visual rhythm and movement and therefore spatial flexibility. Rabeneck [15] argue that the layout is designed to allow as wide a range of varied interpretations as possible which create a different kind of flexibility from that achieved through functionalism. However, such considerations suggest that the need for spatial flexibility in the office spaces might be affected by some changes which are included in:

A. The future of the occupant is not always known during the design.
B. More seldom the same occupant uses the building during its whole life cycle.
C. In addition to the changing occupants, the need for same occupant and his activities change.
D. The office tools and requirements develop and regenerate, new innovations emerge.

7.2 Social aspect

Table 2. Collaborating and communicating effectively

	Open office space	Closed office space
Collaborating and communicating effectively	60%	40%

Table 3. Open and closed office spaces considered shared spaces, encourage collaboration and communication

Open office space		*Closed office space*	
Courtyard	*42 %*	*Individual office*	*5 6%*
Workstation	*34 %*	*Prayer area*	*2 4%*
Prayer area	*14 %*	*Lounge*	*2 0%*
Cafateria	*10 %*		

Occupants suggest that they could collaborate and communicate more effectively in the open office spaces (60%) than in the closed office spaces (40%). Occupants further suggest that the individual office (56%), prayer area (24%) and lounge (20%) are the closed spaces in an office environment that could be considered as shared spaces which could encourage collaboration and communication while the courtyard (42%), workstation (34%), prayer area (14%) and cafeteria (10%) are the open spaces in an office environment that could be considered as shared spaces which could encourage collaboration and communication.

It seems that occupants in the office environment collaborate and communicate effectively in open spaces such as the courtyard and the workstation more than in closed spaces such as the individual office. In general, the larger the office space, the better the evaluation result of collaboration and communication. Nevertheless, collaboration and communication depends on the space type and purpose. Therefore, the finding shows that it is favorable for a large group of the occupants to collaborate and communicate in the public, big size and central usage shared space. Further, the finding shows that it is favorable for an individual group of the occupants to collaborate and communicate in the closed shared space. Brill [1] argued that the closed environment structure encourages communication. It is likely because it could be easier to communicate more freely in the closed spaces.

A result from the finding shows that indicating the best functional performance is more difficult in closed office spaces than in open office spaces. Therefore, collaboration and communication is evaluated with more difficulty in the closed office spaces for an individual group of people than in the open office spaces for the large group of people. But the designer could make it easy through finding

design issues to achieve the optimal closed space planning through determining circulation zones and the areas that in all probability be used. According to the finding, it is easy to consider the best the functional performance of open office spaces. This is likely because it is easy to test the open floor plan for its place capacity through determining the type of enclosure that achieves separateness without isolation. Moreover, it is likely because privacy or publicity in the open office spaces which were shared by a whole group of people depends on a desired identity that achieves a feeling of ownership. This finding considers a psychosocial principle expressed through architectural design: visually interconnected spaces create a capacity for privacy and separateness without isolation. This is supported by Kerstin & Alan [10] who argue that the social spaces are designed spatially through the concept of visibility and interaction or distance and proximity. Furthermore, Michael David [12] argues that separation often plays a large role in the sense of belonging.

Within the house, we are familiar with the hierarchy of space from public to private space. The highest degree of privacy would discourage collaboration and communication. The reciprocity between the public and private spaces in the house would provide architectural approaches and design options that make determining the circulation zones and areas that in all probability be used is easier in the house than in the office. Therefore, enclosure rates of physical house or office spaces would be the easiest design option to encourage or discourage communication and collaboration of an individual group of people or a large group of people. For instance, Eman [4] argues that inhabitants in Sudanese houses collaborate and communicate domain in the private more effectively than in the public domain and the penetration of different inhabitants into the Sudanese house is constrained by a social and religious norm. Similarly, Elizabeth [3] discussed two architectural approaches to mitigate isolation and achieve a balance between such seemingly exclusive notions as interiority and exteriority; one of them is creating contrasting interior spaces within the overall enclosure so that inhabitants can enjoy varied experience in qualitatively different zones. The other architectural approach she discussed to help relieve the sense of isolation is to re-establish a direct relationship to the exterior by redefining what is perceived as external space.

8. Conclusion

The results presented in this study have both theoretical and practical importance. With regards to the theoretical side, the underling dimensions of the physical and social aspects of the design have been identified and what makes the comparison result valuable and useful in considering architectural qualities that create an appropriate office environment was highlighted. Additionally, the architectural qualities which are related to physical and social aspects have been identified and the inter-related nature of those two aspects explored. These findings are significant because they could help treat correlative experiences between the house environment and the office environment.

Using the questionnaire analysis, various components of physical and social design aspects of the office environment and house environment was mainly highlighted. The effective office environment architecture was investigated through looking at the idea of a house. The characteristic qualities of the design aspects (physical and social) were compared. The two aspects were examined as to whether they treat correlative experiences between the home and office environment. The advantages of the new design of office environment using the house environment design model were found which included space planning and circulation, collaboration and communication.

This overall strategy contributes to our understanding of the ideas that could help create sufficient and satisfied environment to achieve comfort. It is hoped the strategy will be useful to all types of offices regardless of their organization types.

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