WORKSPACE ENVIRONMENT AND EMPLOYEE SATISFACTION: A COMPARATIVE STUDY OF TELECOMMUNICATION OFFICES IN ISLAMABAD AND ABU DHABI

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ABSTRACT

Technological advancements have revolutionized the workspace design during last two to three decades. Architects, space designers and engineers are challenged to accommodate this rapid change whereas management and employees are compelled to adapt the new ways of working. The current research is carried out to evaluate the relationship between the built environment (workspace) and human behaviour (employee's satisfaction). The focus of the study is to evaluate the differences of satisfaction level within the work environment among employees of Telecommunication Offices of the two capital cities (Islamabad and Abu Dhabi). It is the global issue that worker psychology, comfort and satisfaction is being neglected and more priority is given to economical benefits within the workspaces. Due to this a large percentage of office employees are dissatisfied with the environmental conditions in which they must function. Recently, for this reason the terms 'user friendly environment' and 'user participatory designs' are being given due consideration. Dissatisfaction with facilities by occupants is consistently revealed in studies of various types of buildings throughout the world. Most of the previous researches on employee satisfaction have explored workers' relationships to their work tasks and their organization. However limited studies focused the relationship between workspace design and workers' satisfaction, and out of which very few researches addressed the developing countries. Therefore, the current study is based on the comparison of workspace impact on user satisfaction in two developing countries. In order to evaluate the worker satisfaction to his work space, three variables were selected i.e. comfort, privacy and efficient work environment on the basis of their significance revealed through earlier studies.

This research has suggested some solutions to demonstrate a better work space that can be achieved in modern office buildings without necessarily increasing cost. The formation of Workspace Impact Assessment Sheet (WIAS) is one of the outcomes of the study which is successfully used in the current research as a tool to evaluate the impacts of the workspace upon user's satisfaction within the selected offices.

Keywords: Workspace design, user friendly design, environment behaviour relationship, employee satisfaction, functional comfort, privacy, telecommunication offices.

1. INTRODUCTION / THEORETICAL FRAMEWORK

According to Wagner (1999), "Satisfaction with the work space and its ability to attract and retain employees is not well documented". But still there is a great deal of subjective and anecdotal evidence to suggest that the workspace/workplace greatly affects the worker's satisfaction. As documented by the users' satisfaction with their space is an important aspect of environmental evaluation since its earliest efforts, such as studies by Craik, 1966; Friedman, Zimring & Zube, 1978; Little, 1968. It refers to the processes through which users can evaluate their physical environment. The basics reflect that the observable physical features and peoples attitude towards a specific space is linked to the processes of evaluation and assessments of the environment. Since the 1980s, the post occupancy evaluation aimed to evaluate the impacts of environmental factors on user's satisfaction and dissatisfaction within the office environments. (Marans & Spreckelmeyer, 1981; Ornstein, 1999; Stokols, 1978; Wineman, 1986 have researches in these areas). Extensive survey and detailed questionnaires addressing the building occupants to measure their preferences were used in earliest post occupancy evaluation, assuming that the effects of the built environment on users can be understood better through measuring users' self-rated satisfaction with individual features. Occupant satisfaction studies have

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revealed that in reality this concept is a measure of building quality, if users are satisfied it indicates that building is performing well to a large extent and if by and large they are dissatisfied the building has failed to perform.

Most post occupancy evaluation studies question the occupants about their perceptions and judgments of workspaces in terms of the perceived qualities of the place. These types of evaluation involve two main aspects, one the functional characteristics of the space that lend themselves to measurement and are considered factors influencing the performance of workers; and the qualities of a place that cause users to consider it satisfactory or unsatisfactory. Thus, surveys of occupant satisfaction in specific buildings indicate which features are preferred and which are disliked by occupants, such as surveys by Walden, 2005 and Windsor, 2005.

The user satisfaction in relation to specific workspace features is tested by many studies of work environment. (Becker, 1981; Brennan, Chugh & Kline, 2002; Hedge, 1991; Veitch, Charles, Newsham, Marquardt & Geerts, 2004, Kim et al. 2008). These studies revealed people's preferences are affected by, among other things, indirect lighting, mechanical ventilation rates, access to natural light, new furniture, and aspects of the acoustic environment, as well as some degree of participation in decision-making. According to this approach, environmental satisfaction is implicitly a measure not only of workspace effectiveness or success, but also of job satisfaction, in spite of the lack of proven connections between them. As a result, occupant satisfaction has become the main "yardstick" by which workspace features are evaluated.

In contrast, there are other researches which show that if the workers are dissatisfied with their work space, it may result into inefficiency, non productivity, fatigue and stress. Research focusing on the biopsychosocial impacts of work satisfaction and dissatisfaction on the modern worker (Sweeney & Witmer, 1991) suggests that one's level of satisfaction with one's work impacts upon one's mental and physical health and overall satisfaction with life. These findings assist the link between workspace and user satisfaction, the resulting concept is that workspace does have positive effects on the workers if carefully planned otherwise negatively affects the satisfaction level and thus, decreases productivity (Seim and Broberg, 2010). Besides, in today's world the importance of workspace can be evaluated as half the working populations in advanced economies now work in offices. During last two decades, the workplace is going through a period of dramatic changes.

Different researches reveal that new workplace strategies and technological advancements are affecting the demand for specialized workspace. The prime factor is that companies are reducing the number of office employees and simultaneously reducing the amount of space assigned to the remaining employees. It also affects the type and distribution of workspaces e.g., fewer individual offices/ workstations, more meeting rooms and project team rooms (William, Becker, and Quinn 1998). Subsequently, due to an increase in the work load, in most cases in today's world, the workspace becomes living space for much of the day. It is need of the time to make it liveable and not just workable. The current study analyzes the workspace impacts on worker satisfaction focusing on:

1) What is the difference between the workspaces and satisfaction level of people in two different cities?
2) Do the workspaces value the psychological requirements of workers?
3) Are people aware about the link between workspace and user satisfaction?
4) What do people value more comfort or financial aspects for a workspace?
5) How the workspaces can be improved in order to satisfy its workers?

For the current research the delimited variables of satisfaction were comfort, privacy and efficient work environment.

2. METHODOLOGY

2.1 Research Design

This research has a comparative; cross sectional study design. The user satisfaction is measured in terms of functional comfort, privacy, and efficient office environment. These variables are measured through different indicators and sub indicators.

2.1.1 Population

The broad population for the study was offices in Islamabad and Abu Dhabi, out of which telecom offices were delimited, and in the next step four telecom offices were selected as the sample, two from each city i.e Islamabad and Abu Dhabi. Four similar telecom offices were selected, in which the workers have similar work requirements in order to have a comparable representative sample (see Figure-1a, 1b, 1c,1d). Almost all the selected offices have been designed as open plans offices, but partial partitions have been made to create worker's cabins. These four offices were:

Figure-1: Telecommunication Offices in Islamabad and Abu Dhabi (a) PTA; (b) FAB; (c) Thuraya; (d) TRA

1. Pakistan Telecommunications Authority (PTA) Islamabad
2. Frequency Allocation Board (FAB) Islamabad
3. Thuraya Telecommunications Company Abu Dhabi
4. Telecommunications Regulatory Authority (TRA) Abu Dhabi

2.1.2 Sampling

The sample was100 workers, 25 from each selected office, drawn by simple random sampling. These included the engineers (senior and junior), assistant engineers, directors, deputy directors, IT officers etc. The designation of these selected workers may be different but their work requirements are same in regard to their job demands.

2.2 WIAS an Observational Measuring Tool

The researcher formed Workspace Impact Assessment _Sheet WIAS. This is a measuring tool to evaluate the workspace satisfaction from the point of view of the people using it through personal observation. WIAS produces data in a form that can easily be used by decision makers to make changes to the workspace in order to improve user satisfaction.

The WIAS is inspired and developed in line with "Building_ In _Use" BIU Assessment sheet that was formed by Vischer (1993). However, WIAS has a different approach as it is a measuring tool for observation purposes, filled by the observer not by the user, but on the basis of users' requirements to keep in mind their satisfaction. This is an approach to evaluate the requirements and needs of building occupants that help the workers and planners to develop strategies for maximizing user workspace satisfaction. The WIAS system functions diagnostically to indicate priorities for intervention and improvement.

The WIAS system is based on the following key premises:

The critical dimensions of the workspace to be assessed are those that affect worker's satisfaction. It is aimed to collect information related to the indicators of the variables (comfort, privacy, and work efficiency). The WIAS can be used by any observer whether its user, designer, planner or researcher. The assessment is based on standardized values in the light of standards and norms of workspace identified through literature review.

2.2.1 How does WIAS work

To observe the satisfaction level with reference to user's needs, three WIAS score sheets were created. To observe comfort sheet A, to observe privacy arrangements sheet B, and sheet C to observe the efficiency of the work environment within the selected offices. This WIAS contained twenty different variables of comfort, privacy and efficient work environment and their indicators. Each has normative scores ranging from 1 to 5. To assist with the data entry a five-point scale was used. The options were poor, bad, normal, good and excellent, in comparison to the standards and norms. Each option was allocated a score: 1=poor, 2=bad, 3=normal, 4=good, 5=excellent. Using the score values, average values can be established for each variable or statement. Average values above 3 indicate that the workspace is having a positive effect on worker's satisfaction and average values below 3 suggest that the workspace is having a negative effect on worker's satisfaction.

The variables and their indicators have been created on the basis of office space standards, norms and guidelines given by different authors and then these variables were observed and noted in the numeric scores by personal observation and measurements by the researchers. Through computerized calculations, these 20 ratings were transformed into three WIS Profiles (bar charts). Each WIAS Profile contains an average score bar for every variable, which is based on the normal scores of each variable in WIAS score sheet. These average or standard bars were named WIAS Norms. The WIAS Norms represent the average quality office work environment which enhances the worker's satisfaction that is based on the normal scores of each variable in WIAS

score sheet. The WIAS scores for a particular office are compared with these WIAS Norms, such as the space organization of building A will be compared with the WIAS Normative score which is 3 and means normal or average, the space organization in any office if better than this will be placed in 4th or 5th scoring bar, which shows its quality as above average and if less than 3 then it is below average.

2.2.2 Procedure

The selected offices were surveyed and a list of the employees was made including their email addresses. At the data collection stage the designed questionnaire was emailed to 100 representative samples. Two reminders with an interval of ten days were sent to the non respondents. In all 80 filled questionnaires were received back. The researcher personally visited these selected offices and evaluation was done through the assessment tool (WIAS), and the photographs were also taken to assist the data obtained from the questionnaires.

The data obtained from filled questionnaires and WIAS was statistically analyzed and the information was presented in tabular format along with graphs. The research questions were analysed with statistical analysis and photographic survey.

2.3 The Selected offices

On the basis of type and nature of business, four similar telecom offices in Islamabad and Abu Dhabi were selected. These offices have open plan layouts and further partitions have been made to accommodate users in order to allocate them a separate cabin space.

a. Frequency Allocation Board (FAB) Islamabad:

Frequency Allocation Board (FAB) assigns the radio frequencies with associated technical parameters for all wireless communication networks of Pakistan after technical evaluation. The FAB building is a single storey building situated in Sector H-10/4 Islamabad. This is an old building constructed about 15 year back and not very well maintained. This is a Government department working under the Cabinet Division and Ministry of Information Technology (Information by respondents).

b. Pakistan Telecommunications Authority (PTA) Islamabad:

The main task of the Pakistan Telecommunications Authority (PTA) is to regulate the establishment, operation and maintenance of telecommunication systems and provision of telecommunication services in Pakistan. The PTA building is a 5 storey building situated in Sector F-5 Islamabad. This is a new building constructed about 4 year's back. The building is well maintained. This is a Semi-Government department working under the Cabinet Division (Information by respondents).

c. Thuraya Telecommunications Company Abu Dhabi:

Thuraya is a world leading mobile satellite operator providing voice, data, maritime, rural telephony, fleet management and other telecom solutions in remote and sea areas. With a satellite system covering more than 140 countries, Thuraya provides an uninterrupted telecom service all the way from Iceland in the Atlantic Ocean to Australia. Thuraya Head office is situated in Abu Dhabi, UAE and an operational centre is situated in Sharjah, UAE. The Head office building is a multi storey building. This is a relatively new building constructed about 8 year's back and well maintained. This is a semi Government department and sister organization of Etisalat Telecommunications Company in UAE (Information by respondents).

d. Telecommunications Regulatory Authority (TRA) Abu Dhabi:

The organizational objectives of the Telecommunications Regulatory Authority (TRA) is to ensure adequacy of telecommunications services throughout the UAE, encouraging telecommunications and IT services within the UAE and promoting and enhancing the telecommunications sector within the UAE. The Head office of TRA is situated in Abu Dhabi UAE, with branch office is all major cities of the UAE. The Head office building is a multi-storey building. This is a newly constructed building about 5 years back and well maintained. This is a Government Department working under the Supreme Council of the UAE Government (Information by respondents).

3. RESEARCH VARIABLES

The status of comfort, privacy and efficiency of work environment in the selected offices had been evaluated by considering the findings of WIS scoring sheets and the results from the questionnaire. In addition to this it is analyzed to what degree the psychological requirements of the workers in these places have been met and where there is a shortfall. The importance of good workspace and its impacts on the user satisfaction level has also been ascertained to understand the awareness level.

3.1 Comfort

Office is the space where an employee spends almost as much time as in his home; therefore comfort is essential not only for putting in a lot of hours but also to work effectively. To evaluate the comfort to its fullest within the workspace three dominant aspects of comfort were evaluated i.e., functional, physical and psychological. These terms can be better understood in the light of these definitions:

Vischer described the Functional Comfort as "A functionally comfortable work environment functions to get work done by users as efficiently and effectively as possible" (Vischer, 1996). Uncomfortable conditions in the workplace too hot, too cold, too noisy, too dark, too light, too much glare restrict the ability of workers to function to full capacity and can lead to lowered job satisfaction and increases illness symptoms" (Conway, 2009).

Considering these aspects, the researcher selected the possible indicators which markedly influence the level of user's functional, physical and psychological comfort and increases his satisfaction. The questionnaire and WIAS for comfort evaluation designed to find out the degree of these eight selected indicators, i.e., the design of the work area, space organization, ergonomics, thermal comfort, lighting, ventilation, personalization and aesthetical qualities of the workspace. From the findings through the questionnaire survey, it is revealed that in all offices there is no significant difference of the sizes within the work areas, except in TRA where the cabin size is smaller not only in comparison with the work areas in other offices but also in relation to the office space standards (see Figure-2a,b,c,d). Generally, in both the countries the workers have less available work area in relation to their requirements, which represents their dissatisfaction (Table-1).

Figure-2: Restricted available workspace with reference to employee requirements (a) PTA; (b) FAB; (c) Thuraya; (d) TRA

Table-1: **Size of the Work Area**

Particulars	Percentage %							
Size (in sq feet)	Available				Requirement			
	FAB	PTA	THU	TRA	FAB	PTA	THU	TRA
Less than 15	5	0	0	15	0	0	0	0
15-20	5	35	0	5	0	10	0	10
21-25	35	20	30	40	5	20	5	20
25-30	40	40	45	20	25	30	25	25
Greater than 30	15	5	25	20	70	40	70	45

The **Space Organization** was observed through the work area layout, which is poorly designed and unorganized in Islamabad offices. Even then some workers are comfortable with the layout and space availability for the things like computer, documents, telephones and reference materials but most are uncomfortable with inadequate space for storage and free desk area. Although the space of workstations in Abu Dhabi is similar to what is available in Islamabad, but its layout is properly organized and work stations are designed in such a way that all the necessary items required by the users are easily accommodated and space is provided for all these things to facilitate the work of the user, so generally speaking people in Abu Dhabi are more comfortable with the space available for all items as compared to people in Islamabad offices (Table-2).

Further, findings revealed that considerations were given to the **Ergonomics** in the selected offices as the workers found to be comfortable with the design and functionality of the furniture items given to them. Except the office table which was not according to the needs of the users in Islamabad offices, as in PTA the worktable top is made of glass, very uncomfortable in use on office tables and also caused glare. The worktables in FAB are smaller and don't have proper drawers and cabinets to meet the workers functional needs. In case of offices in Abu Dhabi, the chair provided to some workers in Thuraya does not allow proper sitting posture, also workers complained about backache. From the findings good **Ventilation** was observed as majority of the people working in Islamabad offices have windows adjacent to their cabins and enjoy fresh air and nice outside view. In case of offices in Abu Dhabi, almost half of the people don't have windows adjacent to their cabins, even the remaining people who have adjacent windows they don't open the windows to enjoy the fresh air. In Abu Dhabi, people are used to live in artificial envelops so they usually don't enjoy the fresh air and surroundings, that's why they are still comfortable even without windows within their offices and also due to hot climate, people believe that they can't open window for fresh air as all buildings are fully air-conditioned and temperature outside is very hot and humid. As for the outside view, another important window function a survey at the Department of Energy, occupants near windows reported fewer health problems than those who were away from windows (Loftness et al. 1995b). In FAB and PTA offices majority of the workers enjoy nice outside view. Thuraya office is located in a good area where there is a nice sea view while TRA office is located in the city where there are surrounding buildings and they cannot enjoy a good view, like most of the buildings face this problem in the capital, the buildings are tightly placed due to expensive land.

The findings through questionnaire revealed that majority of the people working in offices in both Abu Dhabi and Islamabad are contented with the available temperature and light arrangements in their offices. But when it comes to electricity failure problems, it can be seen that it is totally contradictory in both cities as all the people in Islamabad offices face this problem. This is mainly due to the scarcity of power resources within Pakistan. Regarding the **Personalization** aspect, people working in Abu Dhabi offices

Table-2: **Space Organization**

Particulars	Percentage %											
	Comfortable				Moderately Comfortable				Uncomfortable			
Space for	FAB	PTA	THU	TRA	FAB	PTA	THU	TRA	FAB	PTA	THU	TRA
Computer	50	63	100	100	15	37	0	0	35	0	0	0
Laptop	90	82	83	94	0	6	17	0	10	12	0	6
Work surface	55	35	75	90	15	25	20	10	30	40	5	0
Documents	65	50	80	80	15	15	10	15	20	35	10	0
Telephone	30	65	85	95	30	15	0	5	40	20	15	0
Free desk space	20	50	74	55	20	5	5	25	60	45	21	20
Storage	50	30	70	50	0	30	10	25	50	40	20	25

Figure-3: Personalization of workspace in Abu Dhabi officesPersonalization of workspace in Abu Dhabi offices

are more familiar with the importance of personal and decorative items in the workstations and how they positively impact the output of the worker by giving them an opportunity to relax themselves for some time while working (see Figure-3). However, people working in Islamabad offices do not seem to care much about the importance of these items in their offices and work areas and therefore their work areas do not have significant personal items.

The information through questionnaire was further compared with the results of WIAS scoring sheets for Comfort, which revealed the comparison of the findings during the observation of the selected offices with the range of WIAS Comfort Norms. The results show that the total comfort of FAB office is slightly below than the normal values. On the other hand the overall comfort of PTA, Thuraya and TRA according to the WIAS scores are above average, and falls in good categories. This depicts that the work environment has a good quality, which clearly has a positive impact on user's

satisfaction. Out of all these four offices, Thuraya is observed to be the most comfortable building for its users (Table-4 and Figure-4a, b).

3.2 Privacy

As stated by Bellingar, "understanding what constitutes privacy and how the various types of privacy relate to the work environment, as well as how to regulate the interaction between individuals and environmental stimuli, is critical to design effective workplaces" (Bellingar and Kupritz, 2009). This statement reflects the complexity and importance of privacy in the workspace because dissatisfaction occurs from being in situations that deviate from what a person considers optimal. To provide appropriate levels of privacy, the physical setting must be intelligently designed in order to meet the privacy requirements in terms of four overlapping components of privacy which are Acoustical, Visual, Territorial and Informational.

Table-4: **WIAS Aggregated Results for Comfort**

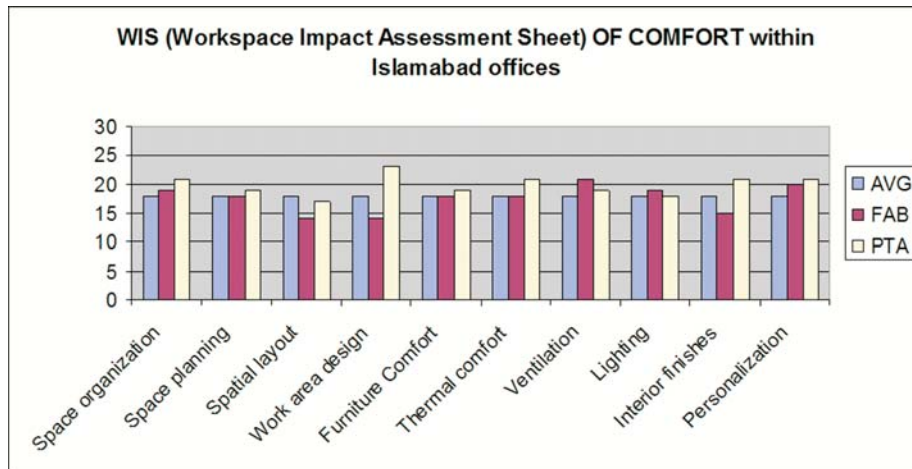|	1	2	3	4	5
	Poor	Bad	Normal	Good	Excellent
WIS Comfort Norms	60-119	120-179	180	181-240	241-300
FAB		176			
PTA				199	
Thuraya				221	
TRA				201	

Figure-4a: WIS Profile showing the scores received about comfort of selected office buildings in Islamabad and compared to WIS Norms.
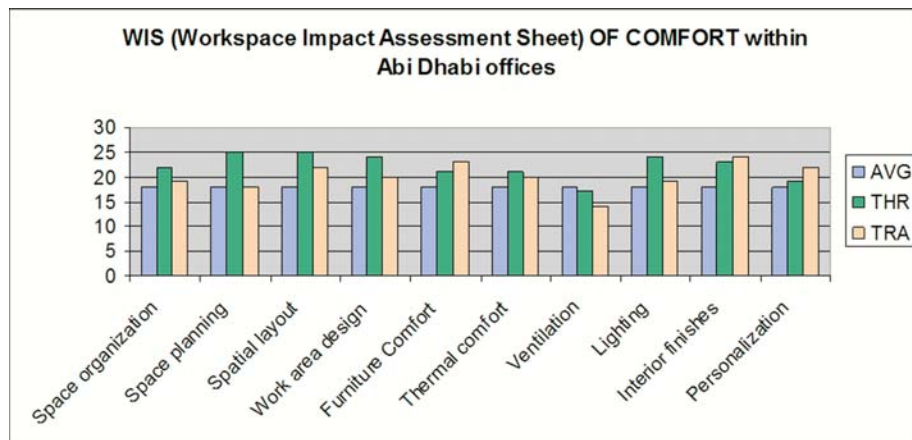

Figure-4b: WIS Profile showing the scores received about comfort of selected office buildings in Abu Dhabi and compared to WIS Norms.

The findings revealed that in both cities, not all the people enjoy the privacy to perform different tasks in the office. Even though most of the people have privacy while carrying out the official tasks, there is significant number of dissatisfied workers, who are not provided with private and secure cabins to have visual, acoustical and territorial privacy. Results show that majority of the people working in FAB office have privacy within their cabins. On the other side, a large number of workers are uncomfortable with the privacy arrangements in PTA office. Although the cabin's design and space organization provides user privacy for working on computer or for conversation, but not to place documents on their tables or to meet the visitors, as the upper half of the partition wall is transparent. The results of Abu Dhabi offices are similar, as majority of the people have privacy to carry out their tasks in TRA office, but still some people in Thuraya office do not feel their work areas as private

cabin, as there is transparent partition (Table-5 and Figure-5a, b, c, d).

Regarding the **acoustical conditions**, majority of people working in Islamabad offices have a normal work area which is neither noisy and nor calm. However, still there is a second highest category of workers who believe that it is noisy. They believe that the noise is mainly coming from the employees around them, computers, and telephones ringing around them which causes disturbance. However, some of the people who believe it is a bit calm also agree that even a little sound is so obvious that people start looking at them and also they feel this calm environment is somewhat boring and this represents their dissatisfaction. In case of offices in Abu Dhabi, it can be seen from the interpretation that majority of people believe that the offices are calm and some believe it is normal. But very few of them believe that it is

Table-5: **Description of Privacy**

Particulars	Percentage %			
	FAB	PTA	THU	TRA
Working on computer	55	50	45	100
Talking to someone on telephone	65	55	35	55
Someone visits within the cabin	50	35	65	70
Placing the documents on the table openly	55	40	90	85

Figure-5a: PTA adequate visual privacy

Figure-5b: FAB inadequate visual privacy

Figure-5c: Inadequate visual privacy

Figure-5d: Adequate visual privacy

Table-6: **Acoustical Conditions**

Particulars	Percentage %			
The work area is	FAB	PTA	THU	TRA
Too noisy	15	0	0	0
Slightly noisy	40	10	15	0
Normal	45	50	25	50
Calm	0	30	50	50
Very calm	0	10	10	0
If noisy then sources of noise				
Outside noise	35	5	0	0
Employees around you	40	35	10	0
Machine's sound e.g. Computers, printers, fan etc.	55	10	5	0
Telephone ringing	55	30	5	0
From furniture i.e. chairs, tables, persons walking on floor	20	5	5	0
If very calm then do you think				
You feel sleepy	10	25	25	0
Even a little sound is so obvious that people start looking at you	15	55	65	5
Pin drop silence is so boring in office	30	40	30	30
background music will enhance your work capabilities	15	20	20	5

a bit noisy. The people who think that it is calm environment believe similar as in Islamabad that a little sound is so obvious that people start looking at them, so they are a bit conscious and uncomfortable about this type of environment (Table-6).

Regarding the WIAS scores of privacy, the observations of the FAB building in relation to WIAS norms has scores more than good and fall in excellent category in WIAS scoring sheet. The privacy of PTA is also above average and

has good quality of privacy to satisfy its users. The results of TRA in WIAS also showed that this office has a good quality of privacy to satisfy its users. But in Thuraya privacy is below average, so the privacy arrangements in Thuraya work area are below average (see Figure-6a, b).

3.3 Efficiency within the Work Environment

Research completed by Balzer and his colleagues suggest that satisfaction with one's work tasks is the greatest predictor
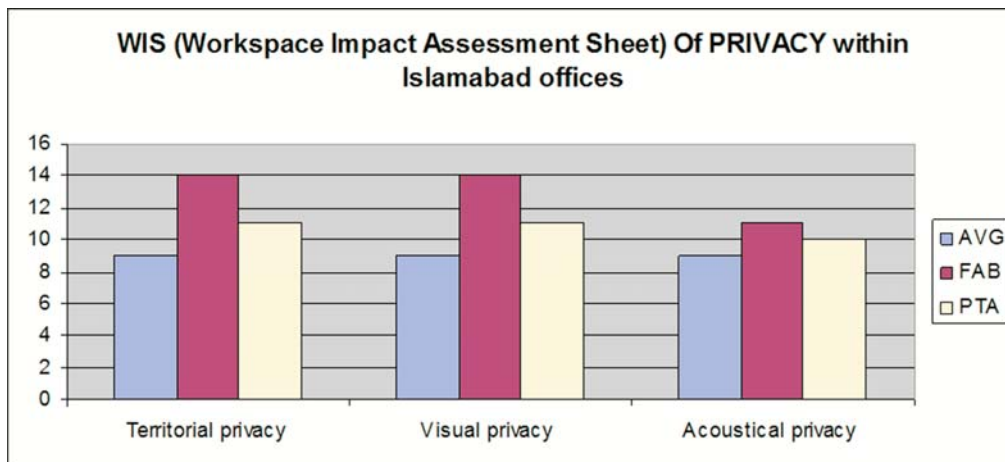

Figure-6a: WIAS Profile showing the comparison of each type of privacy with WIAS average Privacy Norms in every aspect within Islamabad offices.
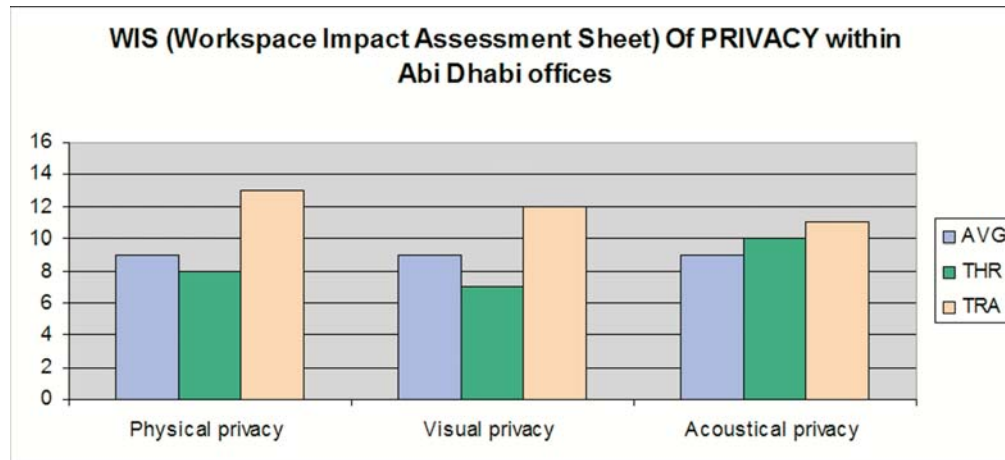
Figure-6b: WIAS Profile showing the scores received about each type of privacy in selected office buildings in Abu Dhabi and compared to WIAS Average Norms.

of overall job satisfaction (Balzer, et al 1997). Therefore efficiency in the work environment is foremost important to have a successful completion of work tasks if one wants to gain satisfaction. As described by Wagner, "a workplace is comfortable and satisfied, if it is efficient and technologically advanced and allows people to accomplish their work in the most efficient way. Efficient work environment is most importantly designed for people with different tools, working at different speeds, within constantly shifting organizational structures but also people with social, personal, and human needs" (Wagner, 1999). Keeping in mind these qualities of efficient work environment the selected indicators for the current research are work area and equipment layout, available tools, accessibility, facilities and services, circulation patterns and clearances in order to achieve better efficiency.

The findings revealed that most people are comfortable with provided **facilities** of washroom, prayer room and conference room in Abu Dhabi offices as compared to number of people working in Islamabad offices. For lunch room facility the people working in Abu Dhabi offices are not very comfortable and the quality according to them is not very good. The people working in Islamabad offices have the related **tools** and facilities either available within their cabins or these are very near to them and they need to walk only few steps to get access to these items. This shows a good arrangement, as people sometimes need to use these tools very frequently, so they need easy access. While looking at the results of the Abu Dhabi offices majority of people don't have the tools and facilities within their cabins, but still they have these near to their office and they can walk a few steps to get access to these facilities. Although this is a good arrangement, sometimes if people have to frequently use these facilities

(printing, scanning etc.), they have to leave their cabins and this is waste of time. The layouts in Abu Dhabi offices provide efficient and easy access to the workers for frequently used items in contrast to the Islamabad offices where the workers either have to extend their arms, or move chair or stand up to get access to frequently used items. However, for all other infrequently used items these offices could be improved.

The circulation patterns are well considered in these offices, as people are comfortable to move within their cabins, from one cabin to another, within the corridors and other office places, but very few feel slightly uncomfortable mainly in TRA office. However, generally the results in both places show a good and user friendly design of the cabin and people are comfortable in their work areas.

The comparison of WIAS from the results of WIAS scoring profiles of Efficient Work Environment, it is revealed that the overall efficiency of FAB work environment is slightly below average. Whereas, the efficiency of PTA is good and above average also in comparison to each aspect of efficiency with WIAS average norms, most of the dimensions are above average, except the space for clearance, which is below average in this office as the furniture is too big in relation to room size and poor furniture layout provides less empty space to move the things around (see Figure-7). The availability of appropriate tools is average in relation to the standards because in Pakistan most government office employees are not provided with technologically advanced tools (see Figure-8a). Similarly, TRA office is good, above average on most dimensions, only the clearance and traffic pattern in TRA office is below average due to limited empty space within the work area cabin and the corridors are also

Figure-7: Inadequate Workspace

quite narrow, which will prohibit the efficiency in the work area. While the Thuraya office scored as excellent in WIAS for its efficiency (Table-8) and above average on all aspects, except lack of a proper lunch room or cafeteria for the workers. But otherwise overall it depicts that it is the best office to provide efficient work environment to the employees and satisfy them to its fullest (see Figure-8b).

3.4 Psychological Requirements

The researchers visited four offices personally and based on observations (WIAS) and responses of the workers (questionnaire), the researchers have analyzed to what degree the psychological requirements of the workers in these places have been met and where there is a shortfall.
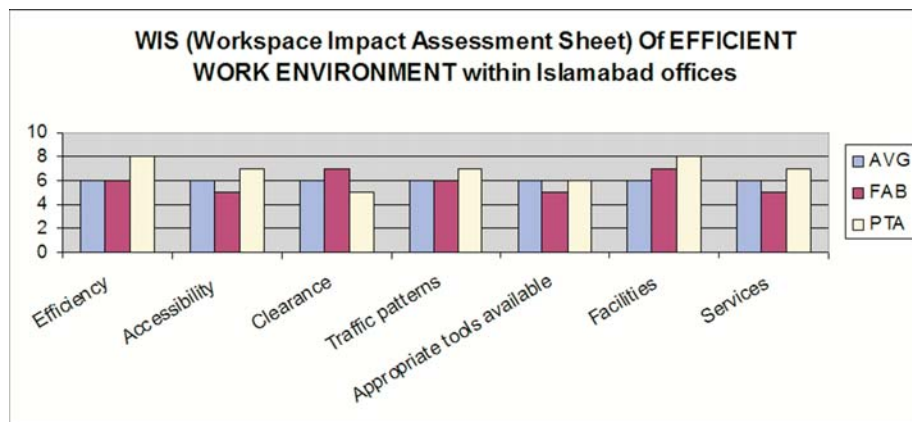

Figure-8a: WIAS Profile showing the scores received about every aspect of efficient work space of selected office buildings in Islamabad and compared to WIS average Norms.
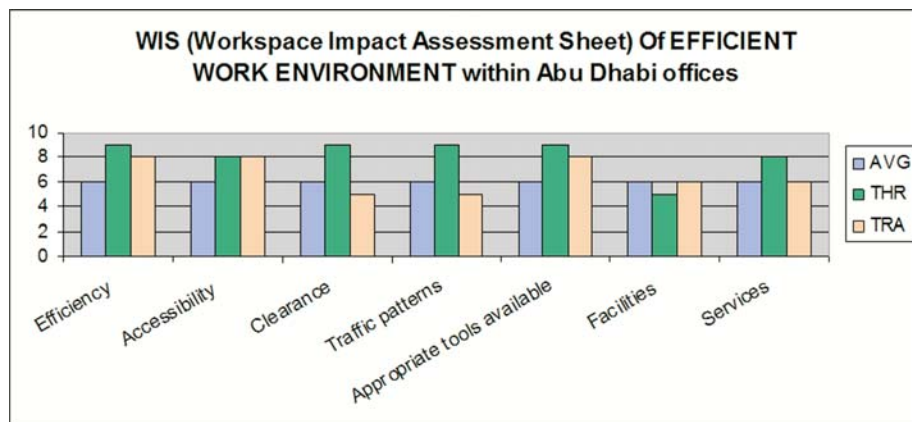

Figure-8b: WIAS Profile showing the scores received about efficient workspace of selected office buildings in Abu Dhabi and compared to WIAS Norms.

In FAB office of Islamabad, the room size is adequate in relation to the other part of the office and for the person's use but the furniture size is small especially the work table in relation to the room size. This gives an impression of emptiness in the room and also represents a negative visual proportion. Haphazard wires, jumbled in each other give the impact of poor electric cable management. The principles of design are not carefully handled and visual variety makes the space quite boring and unattractive. The space design is not modern like the use of old fashioned floor treatment (chips stone), ordinary tube lights and fans. The work area is also not very presentable and the workers do not feel proud about their workspace. Psychological privacy is good in these work areas, also the sense of personalization and territoriality is good as everyone has his own cabin. The selection of color is good as blue is a calm color to be used in work places.

In Pakistan the size of the work areas in PTA is adequate but the size of window is very large for this cabin as it provides more natural light than required and causes too much light exposure. This also causes thermal discomfort. The glass table might be functional for some workers but psychologically it is quite uncomfortable, as the worker is conscious because every time he is putting things on the table, it makes noise, leaves marks on its surface difficult to maintain and also hazardous in case of breakage (being low quality). The reflective material also causes more glare and unnecessary shine. The transparency of glass table makes the worker anxious of his sitting posture. The cabin partition allows every worker to personalize his work area, but the upper portion made up of transparent glass do not provide psychological and visual privacy, the person feel exposed to workers in other cabins if someone stands. The interior is designed on modern lines which makes the employees proud and psychologically satisfied about their work space design.

In Abu Dhabi the Thuraya office has good large sized work areas, but the lack of proper partition walls gives an impact of huge common area rather than a personal work area. Personalization and territorial feeling is missing in these work spaces as the absence of a boundary creates a merger to another work area. People don't have psychological privacy, feel anxious and over exposed. Colour scheme is monotonous at some places. There is a need of variety to make the space more motivated and inviting. Good space organization helps to provide the efficiency and comfortable environment which makes person relaxed both physically and psychologically.

Whereas in TRA office Abu Dhabi, the small sized but well organized cabins even though accommodate the workers need to some extent, but there is a lack of free space. This gives an impression of overcrowding and empowering while workers sit in it, a closed cabin restricts to move, to walk and to relax. The monotony in color and design, make the space dull and aesthetically unappealing. The half of the work areas is devoid of windows, which limits users to have a visual contact with the outside world. This contact is sometimes very useful as it is relaxing and soothing for the worker in a stressed work environment.

3.5 Awareness about Workspace and User Satisfaction

The respondents are asked questions directly and indirectly in order to evaluate their awareness about the link between impacts of work area on user's satisfaction. It is concluded that majority of people working in Islamabad offices agree to the importance of good workspace and its impacts on the user satisfaction level. Replies of the people relate this to health, efficiency, overall output and productivity. Very few people consider this as being not a very important factor. In case of Abu Dhabi offices, most of the people agree that workspace has a vital role in person's satisfaction for his work, this increases the efficiency of both worker and the organization and maintains good healthy environment. However, a considerable number of people do not think that it is of much importance, and people should concentrate on work in whatever environment they are working. One of the main reasons of this difference between the two cities could be that in Abu Dhabi, people are coming from different nationalities/countries having different backgrounds and levels of adjustment in the given environment so they have a difference in their opinions, however in Islamabad, most of the people belong to the same nationality, so they have similar level of expectations.

4. CONCLUSION/ FUTURE DIRECTIONS

The results of this comparative study didn't come out with drastic differences between the selected offices in two cities. However, it is revealed that in Abu Dhabi the workspace is comparatively more functional and efficient as compared to the workspace in Islamabad offices. On the whole the existing work areas in all offices are insufficient to meet user's work requirements in order to achieve full satisfaction. The workers face problems within their work areas in one way or the other, due to drawbacks in workspace planning, furniture designing, layout, aesthetical aspects, and availability of electrical power and advancement of technology in some cases. This has resulted in user's

dissatisfaction in the areas of comfort, privacy and efficiency of their work environment.

As for comfort there is less satisfaction in Islamabad offices because of poor space organization, in efficient equipment layout, inadequate furniture, poor light arrangements and problems of glare and electricity failure. Some drawbacks with reference to comfort in Abu Dhabi offices are also found such as poor ventilation, lack of windows, absence of lunch room and provision of facilities close to work areas. For privacy arrangements respondents in Islamabad offices have shown more concern for aural and visual privacy as compared to Abu Dhabi offices. The response with reference to efficiency in work environment reveals concern for provision of lunch room and visitor's room in Abhu Dhabi offices and dissatisfaction with quality of washrooms, absence of lunch room and conference room in Islamabad offices. The results indicate that in both cities the satisfaction level of people is almost similar, which shows that in UAE the workers have higher satisfaction requirements even though they are provided with the better work areas, whereas in Pakistan the workers are more accommodating because they have to deal with other problems such as unemployment, lower capita income, limited country resources, and lower funds within the offices. However, those Pakistani workers who are working in UAE have developed higher work space demands, since they have adapted the UAE's work environment. It is concluded that the buildings and work areas are adequate in sizes but there is a need of proper designing and reorganization of space. The efficient use of these available resources can enhance the work area's ability to meet work requirements and user satisfaction. Based on the results of the study, if particular focus is given in neglected areas, this would result in better work space organization and thus a higher percentage of satisfied users. The findings revealed that there were no main differences in thinking, preferences, priorities, likeness of the workers, such as in both countries workers themselves are more concerned about their salary and they can compromise on their psychological and physical needs but they don't want any resultant impact on their finances as it will make them more dissatisfied.

However, study indicates that worker performance is directly linked with work environment. For enhanced comfort, privacy and efficiency in the design of future work spaces it is recommended to have user involvement mandatory at an early stage of design. For every user, the work area should have provision for individual temperature control. The design of personal cubical structure should be encouraged in order to improve personalization and to resolve the privacy issues. Informal common rooms or meeting rooms should be

designed in every office for small conversations, or to attend personal calls. Proper organization of furniture, equipment and accessories in the work area should be given due consideration in order to satisfy the workers and better work performance. The quality and approach of the ancillary spaces should also be properly addressed in the office design to provide satisfactory environment.

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