Users' Perception about Environmental Privacy Regulators: A Review through Working Environments

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ABSTRACT

Privacy is an intangible social aspect, which needs tangible solutions in all indoor and outdoor spaces. While individuals spend almost eight hours a day in their work environments, designers and facility planners should be concerned about significance of privacy in their workplaces' design and try to enhance degree of privacy by innovative physical solutions. Increasing organization's productivity and employees' satisfaction are the main results of workplaces with desired level of privacy. Recent studies proved that privacy could be optimized in the work environments by regulating three mechanisms; named as environmental, behavioral, and social mechanisms. Contemporary offices are undergoing radical changes because of arrival of information technology. New types of office works, office workers, and office settings have emerged in this era. Thus, the physical elements and objects (environmental mechanisms) that workers need to achieve optimum level of privacy should be investigated in these new work settings. Designers should adapt their knowledge in order to design appropriate settings for new generation of workers. The purpose of this study is to find environmental mechanisms, which office workers in general and knowledge workers specifically need in order to achieve desired level of privacy. The appropriate type of barriers, workspace size, and desk arrangements are the environmental regulators that are studied in the present research. The study begins with a thorough research on the concept of privacy and privacy issues in the office spaces, and then it focuses on the Environmental mechanism as the only privacy regulator mechanism that is related to the spatial design. A pilot study is also done among assistants of Faculty of Architecture in Eastern Mediterranean University in order to test the applicatory of pervious investigation in a case. Half of the participants in the research were working in closed office and the other half in the open-plan layouts. The study also

tries to find out whether workers in different layouts have the same perceptions about environmental privacy regulators or not. Interviews, closed-ended questionnaires, and direct observation are the methods that are used for collection of data. The study concludes with a series of suggestions for architects and designers in order to enhance quality of indoor spaces of work environments through using the suitable environmental privacy regulators.

Keywords: Office design, Workspaces, Privacy, Privacy regulators, Environmental privacy regulators.

ÖZ

Mahremiyet, tüm iç ve dış mekanlarda soyut çözümler gerektiren bir kavramdır. İnsanların günlerinin yaklaşık sekiz saatini çalışma ortamlarında geçirirken tasarımcılar ve planlayıcılar, çalışma mekanlarında mahremiyet kavramının önemini anlamalı ve yaratıcı fiziki çözümler geliştirmelidirler. Arzu edilen mahremiyet seviyesini sahip olan çalışma ortamları, çalışanlarının tatmin olmalarına ve dalayısıyla üretkenliğinin artmasına neden olur. Yeni araştırmalar, arzu edilen mahremiyet seviyesi 3 mekanizma (çevresel, davranışsal ve sosyal mekanizmaları) kullanılarak elde edilebilidiğini gösterir. Günümüzde ofisler bilgisayar teknolojisinin girmesi ile birlikte radikal bir şekilde değişmiştir. Bu yeni dönemde yeni ofis işleri, ofis işçileri ve ofis düzenleri ortaya çıkmıştır. Bu yeni çalışma ortamlarında optimum mehremiyet seviyesini yakalamak için çalışanların ihtiyacı olan fiziki elemanları ve nesnelerin (çevresel mekanizmalar) araştırılmalıdır. Tasarımcılar bu yeni nesil ofis çalışanları için uygun ortamı sağlamak için bilgilerini yenilemeleri gerekmektedir. Bu çalışmanın amacı, genel olarak tüm ofis çalışanları ve özel olarak bilgi çalışanların optimum mehremiyet seviyesini elde etmek için gerek duydukları çevresel mekanizmalarını araştırmaktır. Uygun olan bariyerler, çalışma alanı boyutu ve masa düzeni bu çalışmada ele alınan konulardır. Çalışma mahremiyet kavramı ve ofis mekanlarında mahremiyet sorunları ile ilgili geniş bir araştırma ile başlar, ve mekan tasarımı ile ilgili olan tek mahremiyet düzenleyici mekanizması olan çevresel mekanizmalara odaklanır. Ayrıca, önceki çalışmaları gerçek bir durumda değerlendirmek için Doğu Akdeniz Üniversitesi, Mimarlık Fakültesi araştırma görevlileri arasında pilot bir çalışma gerçekleştirilmiştir. Bu araştırmaya katılanların yarısı iki kişinin paylaştığı kapalı ofis düzeninde, geri kalanı da açık ofis düzeninde altı ve daha fazla oda arkadaşı ile çalışmaktadırlar. Bu çalışma, aynı zamanda

değişik düzenlerde çalışanların çevresel denetleyici elemanları ile ilgili aynı algıyı sahip olup olmadıklarını bulmaya çalışır. Bire bir görüşme, anket ve gözlem bu araştırmada çalışma metodu olarak seçilmiştir. Çalışma mimarlar ve tasarımcılara yönelik uygun çevresel mahremiyet düzenleyicilerini kullanarak çalışma çevrelerindeki kaliteyi yükseltmeye yönelik bir dizi öneri ile son bulur.

Anahtar Kelimeler: Ofis tasarımı, Çalışma alanları, Mahremiyet, Mahremiyet düzenleyiciler, Çevre mahremiyet düzenleyiciler.

To my family

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Chapter 1

INTRODUCTION

There is an exchange and a dynamic interaction between a person and its environment that changes over time. A person transforms the environment and in return, the environment transforms a person (Ntouskas, 2012). Environmental psychology is a system-oriented discipline that examines human beings in relation to their surroundings. Human beings are parts of a complex system that comprises of smaller systems such as the natural environment, the social environment, the built environment, and other more or less virtual environments. Environmental psychology includes theory, research, and practice aimed at making the built environment more humane and improving human relations with the natural environment and the built environment. In fact environmental psychology is a key component of both human and environmental welfare (Gifford, Steg, & Reser, 2011).

Environmental psychologists work at three levels of analysis: (a) Fundamental psychological processes, (b) the management of social space, (c) and human interactions with nature and the role of psychology in climate change (Gifford, 2008).

In psychological processes, environmental psychologists try to understand, filter, and construct human experience and behaviors created by physical elements of the environments. Responses to the environment are complex and best understood in terms of three psychological stages of human behavior, which include perception, cognition,

and spatial behavior. Perception of the environment, in its most strict sense, refers to the process of becoming aware of a space by the acquisition of information through the sensations of sight, hearing, smell, touch, and taste. Cognition is the mental processing of this sensory information. This may involve the activities of thinking about, remembering, or evaluating the information. Spatial behavior refers to responses and reactions to the environmental information acquired through perception and cognition. The designer creates environmental stimuli to direct these psychological stages as well as the secondary processes of motivation, effect, and development. Environmental expectations, another determining element to be considered by the interior designer, are developed over time through experience and interaction with the environment. Sensations, in combination with expectations of the environment, define one's perception of a space (Cannon, 2013).

Environmental psychologists state that individuals manage physical spaces among them according to complex rules and strong preferences. Although these rules and preferences are not always conscious, their importance suddenly becomes clear when they are compromised. Privacy, personal space, territoriality, and crowding are the main dimensions of social space (Gifford et al., 2011). While all these issues are strongly related to each other it is not possible to concentrate on one of them without understanding the others.

Privacy is a central regulatory human process by which persons make themselves more or less accessible to others. Definition of privacy is different in various fields of architecture, psychology, and sociology. While privacy has multidimensional definitions, there is one thing in common in all definitions of privacy and its individuals attempt to control their interactions with others (Lang, 1987). Additionally, defining privacy as a

phenomenal state which removes individuals from the presence of others is not correct definition for this term (Pedersen, 1997).

Altman (1975) believed that studying on privacy is important because invasion of individual's privacy put person on the emotional stress and initiates conscious and unconscious behaviors to create personal boundaries. In this situation, individuals present types of avoidance behaviors such as move away from the invasive, increase interpersonal distance, reduce visual contact by reorientation of the face or body, and in the worst case prefer to retreat to other environments. These antisocial behaviors and aggression are the results of individuals' failure to achieve desired privacy.

Personal space is the dynamic distance and orientation component of interpersonal relations. It has been studied longer and more than almost any other aspect of environmental psychology (Sommer, 1959 cited in Gifford et al., 2011). Many personal and situational influences interact with preferences for particular interpersonal distances(Hall, 1966).

Territoriality in humans is a pattern of behavior and experience related to the control, usually by nonviolent means such as occupation, law, custom, and personalization, of physical space, objects, and ideas. Territoriality is also a means of achieving a desired level of privacy (Altman, 1975).

Crowding is a subjective experience that is only mildly related to the objective index and population density (Stokols, 1972). Crowding occurs when personal space and territoriality mechanisms function ineffectively, resulting in an excess of undesired external social contact (Kaya & Weber, 2003).

According to the environmental psychology, indoor spaces should be designed and managed in the way that can respond to individuals' sociological, psychological, and physiological needs. Moreover, a built environment, which is created without considering humans' needs, can have unfortunate influences on people satisfaction and decrease individuals' ability to learn and perform their life activities (Ulrich, 1991). It can be more important in designing indoor spaces since people live in indoor spaces such as workplaces, education spaces and homes more than outdoor spaces (Evans & McCoy, 1998). Among these indoor spaces, it is important to consider the human beings needs in their workspaces because of two main reasons; first, a big number of adults spend averagely eight hours in a day in their workspaces, secondly, arrival of information technology and its devices had caused radical changes in the workspaces' layouts and work patterns (Anjum, Paul, & Ashcroft, 2005).

1.1 Definition of the Problem

While the subject of workspaces design becomes a significant topic for managers, designers, and researches (because of mentioned reasons), there are some questions that should be answered about the relations between physical environments and employees' behaviors. Moreover, the impact of physical elements of work environment on users' perceptions and expectations is necessary in order to design workspaces that are more humane. Privacy is recognized as one of the significant concepts in work environment, which have strong effect on workers' well-being and their behaviors. Accordingly, investigating the physical features that workers' need for regulating privacy in their workspaces is an important subject in order to improve the quality of workspaces and enhance workers' communication, satisfaction, and productivity. Moreover, providing appropriate physical features in workspaces in order to improve privacy level, respond the other sociological needs of employees that are relate to privacy such as territoriality,

personal space, and personalization. Accordingly designing an indoor space with desired level of privacy has positive influence on other sociological needs of users in the specific space.

Pedersen (1997) also claimed that lack of desired level of privacy in work environment causes dissatisfaction for individuals and have direct effect on workers' productivity, collaboration, physical and mental health.

Workspaces that are designed by considering physical elements that workers need to achieve desired level of privacy also have strong effect on workers' type of interaction, amount and quality of interaction, and generally their interaction process itself (Goodrich, 1986 cited in Farivarsadri, 1992). Moreover, Sundstrom (1986) states employees are more satisfied through working in these spaces and have more job performance and productivity.

Based on Altman theory in 1977, individuals regulate privacy by using behavioral and environmental mechanisms in the context of their cultures. In his analysis, privacy is culturally universal process when involves dynamic, dialectic, and optimization features. Moreover, in terms of mechanisms which individuals use to regulate their social interactions, privacy is culturally specific phenomenon (Altman, 1977).

Therefore, based on Altman's theory, privacy is a social process which human use their particular patterns to regulate their social interactions. His theory has affected the way scholars think about process of regulating privacy and has challenged researchers to consider a number of significant aspects of privacy. There are many researchers, which

developed and expanded Altman's theory of privacy. Kupritz's (2000) theory reorganized and extended Altman's privacy regulation mechanisms in the work environment.

Based on conceptual model of privacy regulators presented by Kupritz in 2000, privacy in the work environments can be regulated through managing three mechanisms, which are social mechanisms, behavioral mechanisms and environmental mechanisms. Environmental mechanisms in Kupritz theory consists of physical elements that users of the work environments need in order to obtain desired level of privacy. Kupritz (2000) claimed that by providing appropriate types of barriers among users of work environments and creating proper characteristics for workspace layouts privacy will be in its optimum level environmentally.

While there are some investigations about ideal forms of these elements in order to provide desired privacy for occupants in work environments, it cannot be generalized because several indicators affect workers' perceptions and expectation about environmental regulators. Large number of studies proved that the age range, gender, job type, job complexity, job status, cultural background, and individual characteristics affect the workers' perceptions about these environmental regulators. According to Sundstrom (1980, 1982) there is no specific roles for these mechanisms and they should be investigated in different conditions. In addition in the recent decades the office layouts and work patterns changed through the arrival of information technology and its devices. While different studies have been done in order to find the appropriate types of environmental regulators, it is needed to expand these investigations to the work environments in information era and among new generation of workers.

1.2 Aim of the Study

Privacy is one of the important issue that is needed to be studied in the office environment. As was mentioned before beginning from Hall (1966) and Altman (1975, 1977) many studies have been conducted in relation to this issue in different work settings. Kupritz (2000) model is the most resent theory about the privacy regulators in the work environments. She proposed a conceptual model to discuss about privacy regulators. Among the three mechanisms presented by Kupritz (2000), the one that is directly related to architecture and interior designs the environmental mechanism.

The purpose of present study is to investigate the privacy issue in general, then it focuses on this issue in the workspace and on physical elements that can be used in working environments to achieve the desired level of privacy.

In summary, the pilot study tries to find answers to the following questions:

- How do the respondents (knowledge workers) perceive the level of privacy in their existing situations and what are the most important problems they have to achieve the desired level of privacy?
- What kinds of environmental regulators (such as barriers, desk arrangements, and workspace size) they need to achieve desired level of privacy?
- Does the workspace layout affect the employees' perception of level of privacy and privacy regulators?

Based on the literature survey and evaluation of cases, a series of recommendations are developed to help designers and facility planners to improve the quality of indoor space of the work environments in relation to privacy issues.

1.3 Method of Study

The study has two parts, a documentary research, and an analytical case study that has been carried out among assistants of Eastern Mediterranean University (EMU) in the Faculty of Architecture. The documentary research is associated with a wide literature review related to various subjects that are interrelated to privacy. As was mentioned privacy is one of the psychological and sociological needs of individuals that is linked with other social needs of human beings such as territoriality, personal space, and crowding. Accordingly, after a short discussion about different kinds of office layouts in the course of history, the study continues with the short descriptions about these terms and continues with the research on privacy definitions and dimensions in different scholars' perspectives. Afterward, Altman (1977) and Kupritz (2000) frameworks of privacy regulation are described in order to find the ways that privacy can be regulated and improved in the work environments. Kupritz (2000) conceptual model for privacy regulators in work environment is the focus of literature survey in present study.

In the case study part, 26 research assistants in EMU in Faculty of Architecture have been chosen in order to know their perceptions about ideal form of environmental privacy regulators. To be able to keep variable limited to the factors questioned in the study, the other issues such as age range, cultural background, job type, job complexity, and job status were kept constant among all participants. The participants were selected from knowledge workers with the age range between 23 and 33, as the workers that extensively use the technological devices. These assistants are allocated in two types of office layouts, and it was decided to keep the data for two layouts separated in order to find whether different office layout will affect users' expectation about environmental privacy regulators (specifically, barriers, desk arrangement, and workspace size) or not.

In order to collect appropriate data three method is used that include open-ended interview, closed-ended questionnaire, and direct observation. The prepared questionnaire was based on results of literature survey specially Kupritz (1998, 2000). Moreover, drawings of office layouts about actual situations are provided. The questionnaires were evaluated by SPSS software. The data have been visualized through using the bar charts. The methodology of the case study will be described in more detail in the related chapter.

1.4 Structure of the Thesis

The present study consists of seven chapters; the first chapter is the introduction of the study, which explains the importance of the subject, the purpose of the study, the applied methodology, and the limitations of the research.

Chapter two describes the different office layouts which were appeared during the time. Moreover, in chapter 3 the territoriality, personal space, and crowding as the concepts that are related to privacy are described. Chapter four is related to major concepts of privacy. This chapter also examines the definition of privacy through the well-known scholars' perspectives such as Alan Westin, Irwin Altman, and Amos Rapoport. Then the four dimensions of privacy that include physical, psychological, informational, and social privacy are surveyed. At the end of this chapter Altman theory about privacy, as a fundamental contribution about privacy is analyzed. Chapter five deals with the term privacy regulation and its mechanisms. Altman's privacy regulation theory and Kupritz's conceptual model for privacy regulation in work environments creates the foundation of this chapter. The changes in privacy regulations that are generated through arrival of information technology are surveyed at the end of this chapter. The office layout changes

in time and the effect of these changes on workers' privacy level is investigated in chapter three by providing a table in order to summarize these changes.

The characteristics of case study, data collection method, and data analysis is described in chapter seven. Workers' perception about their privacy problems in actual settings and their expectation about ideal form of barriers, desks arrangements, and workspace size are the major data that is searched in this chapter. In addition, data are evaluated based on the literature survey. The summary of results is examined at the end of this chapter. The total findings of present study are summarized in chapter eight with the title of conclusion.

1.5 Limitation of the Study

In order to enhance the quality of indoor space of work environment, many factors may exist that influence on human physical, psychological health and their behaviors. Studying on these factors is important because of their strong effect on workers' satisfaction and productivity of companies. Indoor air quality, crowding, colors that are used, spaciousness of workspace, etc. are some of these factors. The present study focuses on privacy as one of the most important concepts in work environments. This concept is a wide subject that is interrelated to many other concepts such as territoriality, personal space, personalization, and crowding. Each of these concepts can be analyzed in different studies, so the study has just a short touch to each of these subjects as much as it is necessary to understand the privacy issues. Among the concepts related to privacy, privacy regulation and its mechanisms are investigated in this study. Through the optimization of these mechanisms in work environment, the privacy level can be maximized or at least improved. The social mechanisms of privacy are related to establishment of roles and are not related to the field of design. Moreover, the behavioral

mechanisms and environmental mechanisms are linked to each other. In other word, by improving environmental mechanisms in work environment indirectly behavioral mechanisms would improve. Accordingly, the environmental mechanisms are investigated from the architectural point of view in the present study. Furthermore, to achieve valuable data in terms of environmental factors, all participants should have the same job rank, job complexity, job type, age, culture, and gender. Finding large number of office workers with the same features was the main limitation for this study. To be able to generalize the research's findings, it is preferred to conduct the research on a larger number of workers, which was not possible in the existing situation. The present subject with wider number of participants might be investigated in further studies.

Chapter 2

OFFICE HISTORY

2.1 Office Layouts' Background

After understanding the implications that are related to privacy, in the second step of theoretical part of study the process of office layout changes is investigated. As the aim of study is to improve the quality of workspace space by providing desired privacy, it is important to know how privacy level is changed during the time and which physical elements have been used. Accordingly, in this chapter the changes in office layouts and privacy level will described.

The origin of office buildings goes back to the 14th and 15th centuries with the function of banks and barristers. During the time, the layouts of work environments have been changed due to the changes in the types of activities that were done, and the improvement of working devices and tools. In fact, scholars' theories had influential impact in managing how these changes will be. Along with changes in office layouts the users' level of privacy also have changed.

Early work environments in 14th century were located in the small rooms of the owner house. These types of offices existed with less changes until the 18th century. The enormous changes in office layout have been started through the industrial revolution in the late 18th and first of 19th centuries (Marberry, 1994). While only one person used this

office layout and she/he was able to regulate every physical elements by own roles, it seems that privacy existed in its desired level.

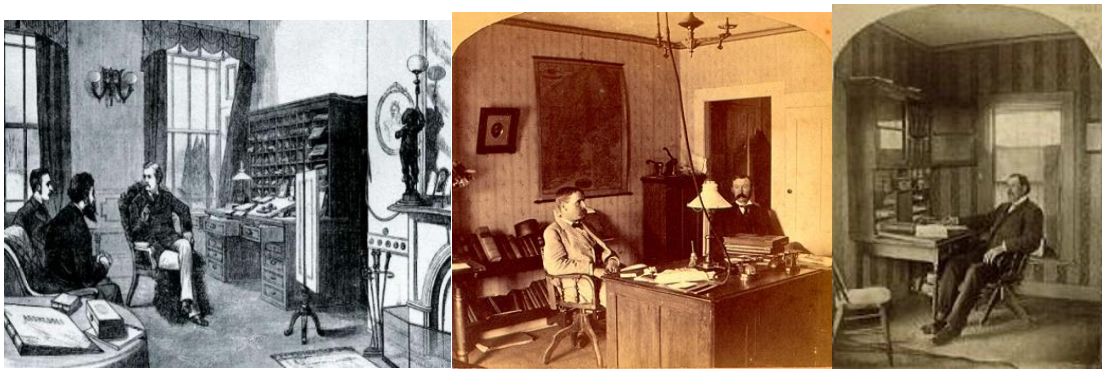


Figure 1: Office Interiors before industrial revolution (http://www.officemuseum.com)

The 19th century was the time that office buildings have been emerged as specific building type. Since 19thcentury, various theories have developed and new terminologies have emerged in order to describe new workplaces' layouts. Predominantly, the work environments after industrial revolution and before information technology era in the late 20th century have been organized into two general layouts. These two layouts are defined as cosed-plan layouts and open-plan layouts (Hua, 2007). The main features of these layouts and the process of changes in their interiors are described in the subsequent parts of study.

2.1.1 Closed-Plan Office Type

Closed-plan offices are consisted of some workspaces completely closed with walls and a door. Arranging closed rooms around an atrium or along a central corridor were the first layout prototype of offices in the late 19th century. These kinds of offices with four full height walls and a door which one or a few staffs working there is defined as closed-plan offices. The idea of closed-plan office provided the opportunities for workers with various activities work together in one place that was the essential need for developing businesses in 19th century (Hua, 2007). In terms of workspace layout, the closed-plan offices and the

layout of primary offices (described in pervious part) were the same, with the difference that closed plan offices were designed specifically in order to conduct the business. In addition, only one person used the offices before 19th century while in some cases group of staffs used the enclosed offices in 19th century. However, closed offices are the traditional form of office layout, todays (21st Century), this type is still used for workers with complex job types or employees with high job rank (Piotrowski & Rogers, 2007).

Figure 2: Closed plan offices (Noorian, 2009)

The closed offices or cellular offices layout rapidly grew in the Europe and in the US until the end of nineteenth century through the development of steel beam structure, electric light, hydraulic lifts, and growth of economy. The workplace floor plan problems and solutions generated from late 19thcentury in both regions based on their socio-cultural values and building regulations. For instance, in the Europe the cellular workplaces created in the narrow floor plan and central corridor to achieve more daylight and natural ventilation. Figure 8 illustrates a different cellular office plan in Europe. In this layout, in order to decrease the length of workspaces, the extra depth is separated and used as a semi private space for every two closed offices (Hua, 2007).

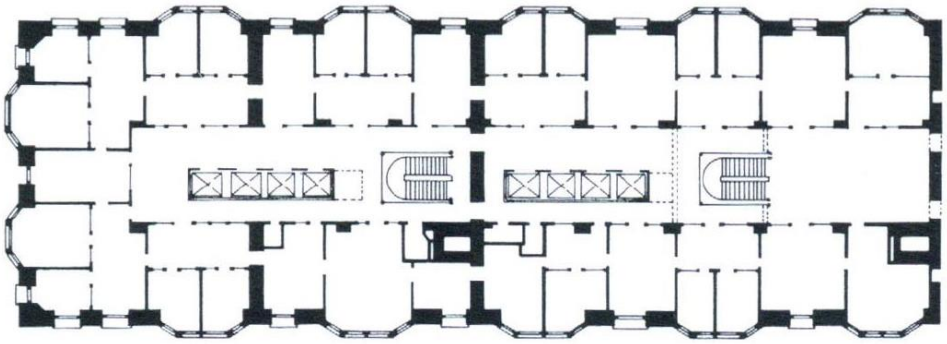


Figure 3: An example of the cellular office layout in Europe (Hua, 2007)

On the other hand, in the US decreasing the cost of work environments' designs and increasing the organizations' profit by making space more efficient played a big role in designing work environments. Accordingly, in the 19th century, the cellular offices in US had serious problems related to workers' physical and psychological health and their satisfactions in comparison with cellular offices in Europe (Hua, 2007). While these type of offices were used in both US and Europe since 19th century, the other forms of office layout were generated in the same time that was called open-plan office. The designers of open-plan office types had diverse perspective about organizational structure. These types of offices were described with more details in next section.

2.1.2 Open Plan Offices Types

After the industrial revolution, beside the closed office layoutthe first open-plan offices were appeared. In general, this term was used to describe a work environment which its main feature is absence of walls between workstations. Open-plan office layout was the appropriate answer to the needs of employers in the late 18th century, where the main aim of the companies was to increase organizational benefits by using maximum empolyees' efficiency. Moreover, companies needed enormous number of workers for mass productionand with open layout provided adequet space for accommodating these huge numbers of workers with less costs (Hua, 2007).

In the US, the open plan layout was a result of Frederick Taylor's contribution to management thinking that is called 'scientific management' or 'Taylorism' (Duffy & Powell, 1997). In the early 20th century (after first World War), the scheme was proposed only for factories but later it was adopted to different types of business (Grech & Walters, 2008). Duffy and Powel (1997) described the particular principles of Tylor's ideology as dehumanization, less hierarchy, depersonalization, and direct supervision. Based on Tylor's theory people were used as units of production not as human beings. Moreover, due to the lack of technology of the time, it was essential for all workers to be assembling at one time in one place in order to get the tasks done. Supervision was the other Taylorist principle for management, Tylor believed that workers could not be trusted; accordingly they need careful observation and ruthless control. Hierarchy was the explicit feature of Taylor's thinking; there were specific place for everyone and it did not change even during person's job life. A larger desk and more space around the workers' desks were the award of punctuality, honesty and commitment of workers. The privete offices were assigned to managers and sopervisiors (Duffy & Powell, 1997). Duffy and Powell claimed that Taylor's management thinkings reflexed the violence of war in the work environments.

According to Taylor's proposal, work was defined as an activity which each empolyee with minimum skills was able to do it. Besed on this organizational decision, a new form of office layout was appeared which is called "bullpen" or "pool" office.This layout was similar to factories' production line used for office clercks (Grech & Walters, 2008)

Figure 4: Bullpen office system (www.history.navy.mil)

The “bullpen” or “pool” office is an open-plan office which was occupied by row of desks without any partitions among them and staffs had their individual task with the less need of collaboration and conversation. The layout of this type of offices had minimun considration to the staffs’ satisfaction and their comfort. Accordingly “bullpen” offices were faild after the World War II.In this period, developments in technology and new types of jobs, this needed more communication between staffs, made bullpen offices less common.

While in the early 20th century the bullpen office system formed as an first example of open-plan office, the demands of more flexibility, transparency and maximun density deacresed popularity of this model in the US (Grech & Walters, 2008).

During the 1930s and 1940s , some psychologists craeted theories aginst Tylor’s attitude toward the workers. These theories concenterated on employee motivation development, interpersonal relations, and workers’ psychology in the work environment. They blieved

that lack af hierarchy in work environment and comparison of employee with production line destroyed their motivation and had negative effect on psychological health of them (Hua, 2007).

The bullpen office layout were further used in mid-twentieth century in the United State with the deeper plan office buildings, by adding air conditioning and fluorescent light. This type of open-plan layout is still used in some work environments or specific areas of some workplaces. The new bullpen settings emphasize on workers' comfort in terms of desk arrangements and size. In the 21st century, this layout is used for routine tasks with less complexity such as call centers (Hua, 2007).

Figure 5:Bullpen setting in a call center (Marmot & Eley, 2000)

After World War II, the main goal of designing offices' layout was to decrease the cost of workspaces and to increase the organization efficiency. Consequently, the work environment layouts until the end of 1950s were impressed the 'scientific management' principles in both Europe and United States. In the early 1960, the discovery of human capital generated new layout for work environments. The new office layout was designed based on the fact that organization's efficiency can be increased through the encouraging

informal communication between the employees (Arnold, 2002). According to new way of thinking about organization's productivity, the new approach was oriented in Germany by the Quickborner Team in 1960s. They called this new office layout 'burolandschaft' or 'office landscape'. The new office layout was introduced to the United State in 1964 (Marberry, 1994).

In this office layout, there were no closed offices, and furniture was positioned at odd angles and asymmetrical spacing. In some examples of these layouts, large potted plants were utilized in order to separate the areas. In fact, the significant aim was to create a non-hierarchical environment for more collaboration and communication (Sundstrom & Sundstrom, 1986).

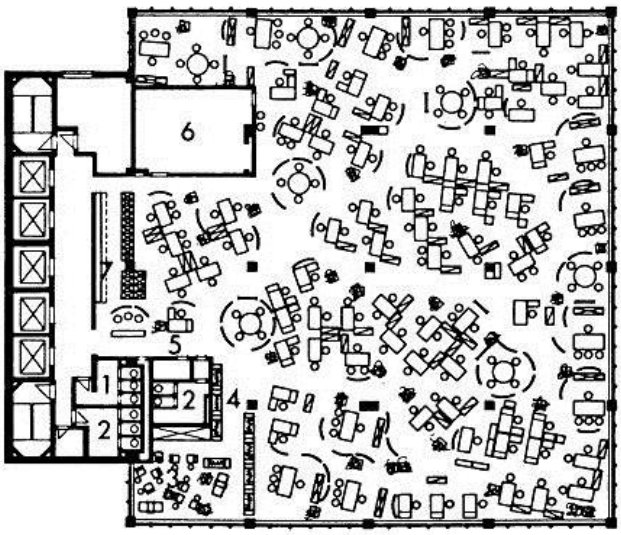


Figure 6: An example of office landscape layout (www.technosalon.com)

The designers who used this layout believed that completely open-plan office (landscape office) removed physical status symbols and was the most efficient design for organizations' layout. Moreover, the flexibility and the space-saving features of 'office landscape' widespread this type of layout in both Europe and North America (Hua, 2007).

The landscape office system removed the hierarchical restrictions and provided some places such as meeting facilities and coffee areas close to workstations to support informal interactions. Although the landscape office layout enhanced staffs' communication, flexibility, and informality, lack of visual and acoustic privacy were the main problems of this layout (Hua, 2007).

Along with constructing first examples of office landscape in 1960s, workers' privacy problems were appeared and Quickborner team decided to add some curved partition with the height of 5 feet in office plan in order to enhance privacy level in this layout. Figure 12 illustrated the office landscape layout with addition of curved partitions (Sundstrom & Sundstrom, 1986).

Figure 7: Landscape Design Concept with addition of curved partitions (Sundstrom & Sundstrom, 1986)

Later in the 1964, the "Action office system' was designed by Robert Propst and manufactured by Herman Miller. New office furniture was the outcomes of this corporation in order to provide more privacy for workers (Marberry, 1994). Along with

the production of ‘Action office system’, new layout for open plan offices appeared which is called the ‘cubicle’ or ‘panel-based’ layout. In this layout, the integrated furniture or panels identified employees’ workspace boundaries. In addition, for economic reasons the cubicles were packed in Miller’s company and were assembled in open-plan settings. The cubicle office layout provided more visual privacy for workers by using different partition heights (Hua, 2007).

Figure 8: An example of ‘Cubicle’ office layout (http://office-turn.com/tag/modern-office-furniture)

While using panels in the cubicle offices provided better privacy level in comparison with landscape offices, still a limited level of privacy existed. Moreover, the office landscape seemedunsustainable through the high energy costs that had been caused because of artificially lit and deep expanses of air-conditioned (Laing, 2006).

Other than ‘cubicle’ layout, two different types of office layout were generated in 1970s in order to solve problems of office landscape. The “Combi” office and “Main street”

office were developed as a result of re-thinking about the office layout. energy costs, staffs' needs, and their comfort had an important role in these new offices. The combi office concept was the combination of open-plan and cellular layouts in order to decrease their disadvantages.As it is shows in figure 12 this office system have been organized based on a cluster of small cellular offices and some open meeting areas in the middle. In this layout, the narrow building with the cellular offices decreased the energy costs and the private offices provided the opportunities for workers to have more control over their workspaces (Arnold, 2002).

Figure 9: An example of "Combi" office (www. amstelgebouw.nl/uk)

The other effort to create better office building spaces consisted of "application of city scape in office building". In this type of office, the work area was linked with "main street" with different public services and ambient areas. The famous example of this type of office building is SAS building (Hua, 2007).

Figure 10: SAS building an example of 'street' office building(http://www.uv-system.com)

The SAS headquarters is an explicit example of 'street' office building in the late 20th century designed by Carlzon. In the building's layout, internal street is used as a powerful managerial device in order to bring all workers together. In fact, while each employee has own private office, the specific office design creates an interactive work environment. The street with its facilities such as restaurants, training rooms, shops, and sports facilities is the place where workers meet each other (Duffy & Powell, 1997).

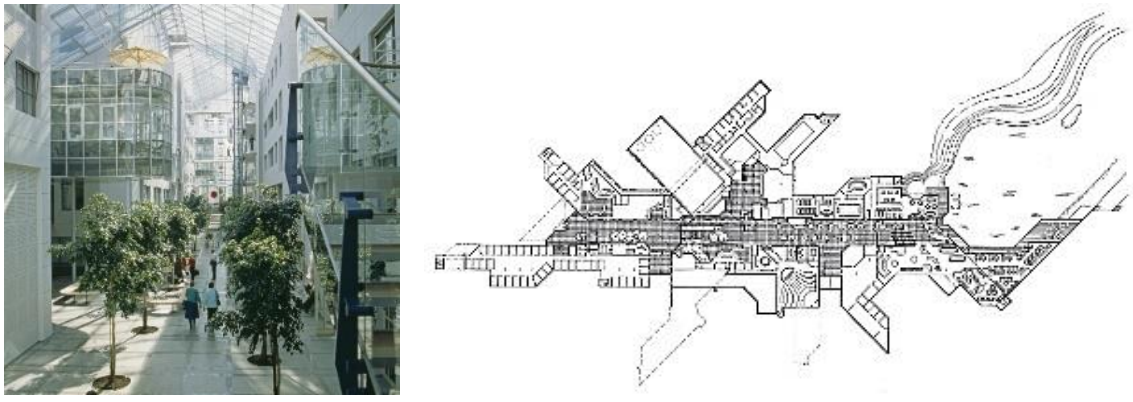


Figure 11: SAS headquarters Main Street, Sweden, Completed in 1988 (http://www.architectural-review.com)

durin this chapter workplace layout solutions during the 19th and 20th centuries that were generated in US and Europe. Accordingly, the work environments were designed as the specific building type in the 19th century and the process of developing this layout have been continued untill now.

As office layouts were changed during the times the amount of workers' privacy and physical factors which they needed to achieve optimum level of privacy is also changed. while different physical elements generated to improve privacy level in work environments, finding appropriate environmental privacy regulators should study more than past in information era. Through the arrival of information technology, in the late 20th century, the work patterns were changed accordingly it affect the office layouts. These changes had important effect on workers' perception about privacy. In the following chapter, the impact of information technology on the work patterns ,office layout variations, and workers' perception will be investigated with more details.

2.1.3 Information Technology as the Agent of Change in the Workspace

In the 1980s, the emergence of information technology and its devices brought significant changes in work patterns and workplace layouts. Accordingly, several new office concepts were emerged in this period. The popularization of the desktop computers for doing office tasks was the starting point for the change in the work environment toward using information technology at the beginning of 1980s. Hence, the first studies about the office design and information technology was started in the USA and in the UK by DEGW (a leading architectural firm specifying in work environment in the UK), and ORBIT (Office Research: Buildings and Information Technology) researchers in the early 1980s. They had serious efforts to explore the ways that new technology would influence the office building's design, office interiors, and environmental service.

Moreover, these researches had extensive effect on the most significant British office projects and later on office design worldwide in the late 20th (Duffy & Powell, 1997).

The first problems that occurred in office buddings toward using technology were undisciplined cabling behind the devices, concentrations of heat, lack of appropriate ventilation system to control hot spots, susceptibility of electric devices to glare and dust, security of information within and between offices, and ergonomic crises caused by using of keyboards and screens. ORBIT and DEGW solved some of these problems through their extensive researches (Duffy & Powell, 1997).

In addition, existence of desktop computers caused significant changes in office layout in 1980s. Hence, in this decade, the main purpose of office buildings became less about workers' communications, than on how individuals maintained digital information. The desktop computers chained workers to their workstations during the office hours. Accordingly, the open-plan cubicle with a desktop computer for each workers was the most popular office layout in 1980s. As it is shown in figure17, the fixed workers' positions were in contrast to the office layouts in 1960s and 1970s that were dynamic, communicative, and interesting (Duffy, 1992).

Figure 12: Office Cubicles in 1980s (http://www.btoffice.co.uk/blog/history-of-office-furniture-1/)

In the late 20th century, work concept was changed through inventions of new technological devices such as mobile computers and cellphones. While the workers found ability to carry their personal computers everywhere, their workstation dependency was eliminated. Now they were not associated with a central office building and the small cubicle inside it to do their job (Laing, 2013).

Technology created new opportunities for workers that allowed them to work at home and at the same time use time-sharing offices if they needed. Accordingly, new workplace concepts were created in the 1990s. In new concepts, in most of new job activities, workers did not need a permanent workstation (Duffy & Powell, 1997).

The research has been conducted by DEGW proved that the workstations are empty in extensive part of workday after arrival of technology in office buildings. DEGW Report (2007) investigated that through the development of information technology the time spent in the workspace and generally, individual time spent at the desk is decreased.

Figure 13 shows that in this study the workspaceshave been empty more than 60% of work day (gray and white areas). In addition 35-40% 0f this time is spent for working with computers (the green area) (Steelcase, 2002 in Hua, 2007).

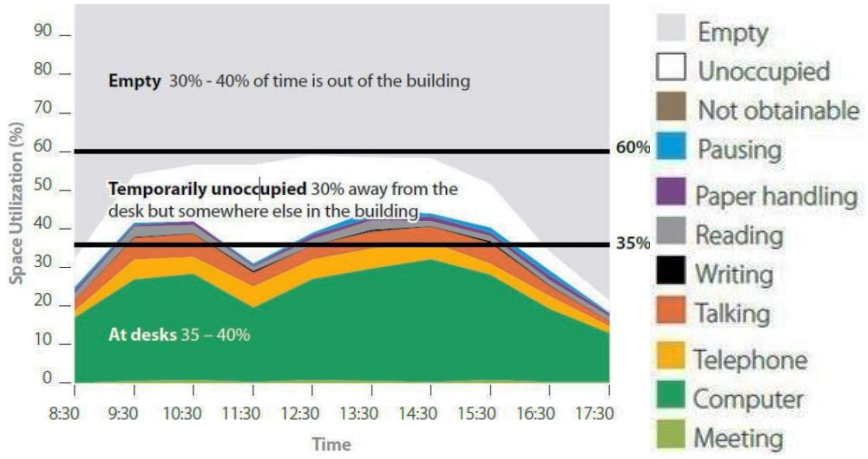


Figure 13: Activities in workplace("DEGW Report The Impact of Change," 2007)

Considering this fact Becker and Steele (1995) created a "total workplace" concept aiming at exploration of the new workplace patterns: they identified a new implication for the 21st century workplaces:

> ". . . The workplace is not simply one's desk, office, or workstation in an office building. It is also the cafeteria, the conference and break rooms, the project room, corridors and water fountains, the fitness center. It is all the places in which one works . . . organizations need to conceive the workplace as a system of loosely coupled settings that are linked by the physical movement of people and the electronic movement of information in a way that enhances the organization's ability to meet its fundamental business objective" (Becker& Steele, 1995 quoted in Zhu, 1997, p. 14-15).

William Mitchell (2003) also described 21stcentury workspaces; he noted that there is no need to go to work, much of individual's activities are done through using networks of information technology such as laptops or cellphones anywhere. He also mentioned that architecture and urbanism should be aware of new use of space and buildings in digital era (Mitchell, 2003).

According to new workspace concepts new offices appeared to response new changes, “hot desking” and “hoteling” aretwo of them. The concept of hot desking emerged in order to maximise cost effeciency in office layouts. In hot desking office each workstations is shared among a group of co-workers. Whenever one need to work in office can reserve the available desk. The number of workstations in “hot desking” layout is usually 50-80 percent of actual number of workers (Harrison, et. al, 2004 inHua, 2007).

Figure 14: ‘Hot desking’ system (Duffy & Powell, 1997)

“Hoteling” is the other approach based on similar management concept that the most commonly is used in the UK. Hoteling offices were appeared in the late 1980s and were similar to booking a hotel room; the workers reserved workstations for an allocated time (Anjum et al., 2005). While in the “hot desking” system the occupants are specific office workers, in the “hoteling” the workers are not specific. Each person in society is able to reserve one desk for explicit time. This feature of “hoteling” distinguished its system management with hot desking. Harrison (2004) believed that the new office approachs are facing with issuses such as removed personalization opportunities desired by workers, difficulties in managing reference materials, and missing physical hints that help to manage work (Harrison, et. al, 2004 cited inHua, 2007)

In the 21stcentury, most of the obsolescent patterns of work such as face-to-face supervision and using paper file and archived are eliminated through using technology. In addition, collaboration has not limited to the face-to-face communications and knowledge workers have virtual communication in information technology era most of the time (Laing, 2013).

In this period, Duffy proposed the other workplace prototype and called it 'the networked office'. He claimed that information technology has changed work time and work spaces. Moreover, the use of information technology has removed the synchrony and collocation of activity as two 'iron lows' of 20th century. The new ways of working in the 21st century that is related to ubiquitous networked information are done in the networked office by knowledge workers. In addition, the networked offices eroded all of conventions of 20th century work by the use of technological connectivity. According to this concept, organizational boundaries do not exist and workspaces can be identified in multiple types of places. Duffy (2008) pointed that most of individual tasks in the 21st century are automated and can be conducted in every places besides the office. In other word, the networked offices are 'communal rather than solitary characteristics', 'happy accidents' rather than planned encounters and meetings (Duffy, 2008).

Based on Duffy's proposal the most valuable workplaces will be those that promote virtual and social interactions among workers simultaneously; it means that 'placeless' is not appropriate solution for 21st century workplaces. The office buildings should be designed in the way that provides fewer specialized spaces, maximizes accessibility, and promotes face-to-face interaction. Marissa Mayer, the chief executive of Yahoo, believes that the best decisions and insights occur in the public spaces of office building such as hallways and cafeteria, when people meet each other accidentally (Laing, 2013).

The best examples of these kind of workplaces are generated in tech companies like Google, Facebook, Apple, Twitter, and so forth in the early 21st century. Creating informal workspaces in order to encourage communication, collaboration and innovation among workers while they are working in virtual settings are the focus of managers and architects of these series of buildings. Clive Wilkinson, the architect of google headquarters office claimed that he and his team started the design of Google office, since it was a cubicle land and moved away from a typical cubicle layout toward the designs, which were more transparent and communicative, were the fundamental design's purposes. To achieve this aim, the first step was to convert all enclosed rooms to the glass rooms as is illustrated in figure 23.Parallel with these private rooms the public spaces are designed to promote face-to-face interactions for knowledge sharing in workspace (Wilkinson, 2014).

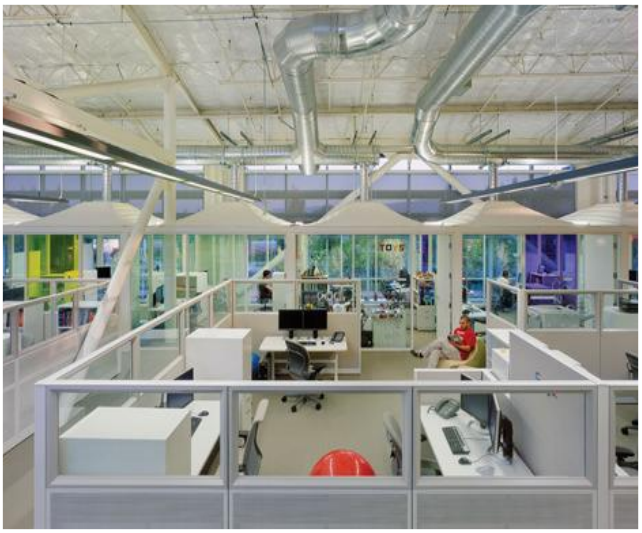


Figure 15: The closed transparent rooms of Googleplex offices in Silicon Valley (http://www.dezeen.com/2014/03/17/office-design-google-clive-wilkinson-interview/)

Figure 16: The public spaces for unplanned interactions in Googles' offices (http://www.dezeen.com/2014/03/17/office-design-google-clive-wilkinson-interview/)

Designers of tech companies also considered some creative cubicles inside the work environment while workers needed more concentration on their work or more private space. In other word, the cubicle did not completely remove from creative work environment of tech companies, just they adapted with new ways of working in 21st century. Figure 25 shows some examples of these cubicles that are used in Google's offices (Sullivan, 2012).

Figure 17: Modern styles of cubicles in googles' companies (http://www.decoist.com/2013-06-04/office-spaces-amazing-cubicles-with-modern-style/)

In summary, inventions of information technology had radical changes in work patterns and accordingly office layouts at the end of 20th century and early 21st century. In the late

20th century through the widespread of information technology devices, office designers and managers believed that workers did not need to permanent workspaces for doing their job activities. Based on this concept, some office layouts such as hoteling and hot desking were appeared. In the early 21st century, this concept failed due to negative effect on workers' communication, collaboration, innovation, and in general workers' social needs. Designing informal work environment that promotes face-to-face communication while workers are working on virtual setting is new way of thinking about work environment. In new era, workers have to use virtual tools for communications meanwhile; they need to work within groups. In these layouts, workers' perception about optimum level of privacy has been changed. To improve physical characteristics of work environments due to new work patterns, workers' privacy perception should be studied. Understanding privacy definition and its dimensions are the most important part of this investigation. Accordingly, in the following chapter the terms privacy is surveyed generally.

Chapter 3

HUMAN BEHAVIOR

This chapter examines the relationship between individuals and their environment how they perceive space and how they react to it. Perception of one's environment is affected by sociological needs, psychological state, and individual differences. The environment itself also influences human behavior. People's perception of their environment influences their social interaction within that environment. Social interaction can be discussed in terms of four concepts: privacy, personal interaction levels, territoriality, and crowding.

Privacy, personal space, territory, and crowding are the human behaviors that are strongly linked together. It is not possible to conduct a research about one of these concepts without understanding the other ones. Accordingly, in order to achieve the aim of this research a summery about definitions of these terms (territory, personal space, and crowding) and their relations with privacy are described in the following chapter.

3.1 Territoriality

Territoriality or territorial behavior is one of the behavioral mechanism, which individual or groups use to control and regulate privacy. Altman defined territorial behavior as individuals attempt to establish social or physical boundaries in order to prevent unwanted intrusions. Consequently obtaining privacy is the main function of territorial behavior or territoriality (Altman, 1975).

The concept of territorial behavior comes from investigation and observation of animals' behavior in the early 18th century. Later in the mid-20th researchers observed same behavior in human populations. Ardrey (1966) and Lorenz (1969) brought the territorial behavior to the public interest. They claimed that human similar to animals, tend to claim and defend own territory. However, there are many diversity between human territoriality and animal territoriality (Ardrey, 1966; Lorenz, 1969 cited in Brown, 2009). The territorial behavior in animals have biological base. The mentioned behavior in animals includes localization of specific place, commonly by physiological means such as urination, then defensing own place by fighting. Even if territorial behavior in humans have biological base, it has cultural base too. The size and local of human territories are considerably different from animals. Their territories consist of place, objects, and ideas, which individuals mark them by physical barriers and symbolic markers (Han, Li, & Shi, 2008).

In the traditional studies related to territorial behavior, the human territories have been limited to the physical place and physical objects. Brown, et.al. (2005) claimed that the terms objects have extensive meaning in territoriality, which involve tangibles and intangibles. Personal properties and physical space are tangibles examples and roles, ideas, responsibilities, are intangibles ones. Moreover, the object can comprise social entities, such as individual and groups (Brown et al., 2005). Brown (2005) defined territoriality as "actions or behaviors that often emanate from psychological ownership for the purposes of constructing, communicating, maintaining, and restoring one's attachment to an object" (Brown et al., 2005 p: 579).

The territorial behaviors have been categorized into two major groups: marking and defending. Marking refers to members' proprietary attachment to specific organizational

objects. These territorial behaviors are related to members, which construct and communicate to others in the work environment. Individuals use meaningful gestures or physical symbols to specify boundaries around them and to identify the particular territory that belongs to them (Brown, 1987; Sommer & Becker, 1969 cited in Brown et al., 2005). For instance, the nameplate that is installed on individuals' doors, pictures of one's family members on computer screen, and existence of a coat on a chair are physical symbols of territorial marking. Furthermore, the titles used by certain members, social rituals, and public pronouncements of individuals' ideas define territories by social markers. This is important to distinguish territorial marking with human symbolic behavior. For instance, changing on poster or brochure of organization by members in order to ridicule the company or the boss does not mean a territorial marking (Brown et al., 2005).

In addition, the territorial marking can be permanent or temporary. Hanging one's painting or certificates on office wall is a permanent marking and putting the file folders on a meeting table or listening music in open plan cubicle loudly are temporary marking (Becker, 1991).

Fear of infringement creates two major types of territorial defenses: anticipatory defense, and reactionary defense. Anticipatory defenses are the actions before an infringement and have an uncommunicative nature. Locks on the door to prevent from entering of intrusions, hiring a receptionist to prevent access to senior executives are the examples of anticipatory defenses. The reactionary defenses are the individuals' reactions after an infringement attempt; they use an emotional expression toward the infringement (Brown et al., 2005).

These types of territorial behavior were observed in animals before humans which involves fight and flight responses to territorial infringement (Edney, 1974 in Brown et al., 2005). Reactionary defenses in organizations involve informal reactions such as expressing irritation, glaring, yelling and slamming doors, seeking the support of coworkers, and firing off protective e-mails (Brown et al., 2005). Figure below illustrates different kinds of individuals' territorial behaviors that are categorized by Brown in 2005.

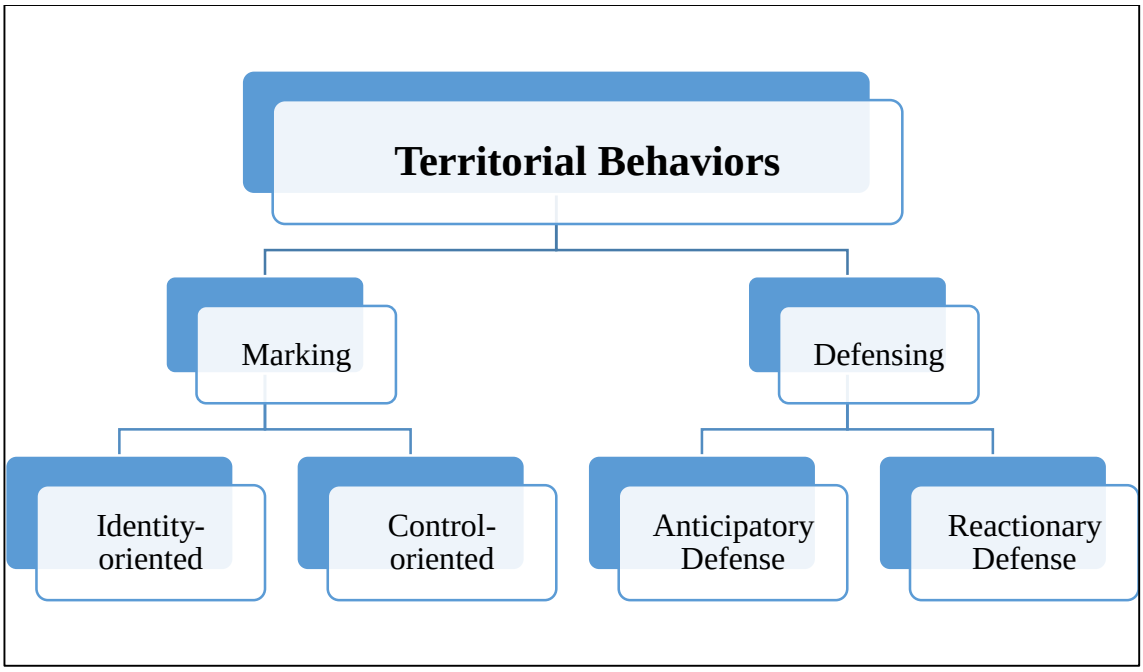


Figure 18: Different kinds of territorial behaviors

3.1.1 Personalization

Personalization is directly linked to territorial behavior as it means to use personal belongings in order to determine and mark one's territories' boundaries. Moreover, individuals personalize specific spaces in order to control their communications with others. Altman (1975) states that personalization can decrease the amount of stress in the spaces where lack of privacy disturbs the individuals. Sundstrom (1987) indicates that personalization is a kind of territorial marking. Identity-oriented marking or personalization involves marking objects with symbols, which reflect psychological

ownership and one's identity. For example, displaying family pictures to indicate personal aspects of oneself is Identity-oriented marking.

With this form of territorial marking, members can express a variety aspects related to their identity, including their professions (hanging diplomas and degrees on the wall), aspects of their personal life (adorning their desk with children's paintings or travel photos) and their status (using title after their name). Consequently, personalization is a significant type of territorial marking, which, allows members to be distinguished from others and enhances the sense of belonging in organizational members (Wells, 2000).

A number of factors in organizations, which increase similarity in work environment, have negative effect on individual's self-expression. Job standardization such as enforced dress code and identical cubicle workspaces limits employees to use physical markers in order to distinguish themselves from others (Rafaeli & Pratt, 1993 cited in Brown et al., 2005). Accordingly, members are limited to regulate behavioral mechanisms and feel less privacy (Kupritz, 2000).

In the research of Barber (2000), 73 percent of employees said that personalizing offices would make them more satisfied and more productive; and they would feel more commitment to their company and job (Barber, 2000 cited in Brunia & Hartjes-Gosselink, 2009).

Wells (2000) investigated that the purpose of workplaces personalization is different for men and women. Women personalize their offices for expressing their individuality and identity in order to feel attachment to the work environment. Despite women, men personalization's goal is to show status and mark the place to achieve ownership.

Moreover, other empirical researches found that women personalize their offices more than men do. Women use items, which involve symbols of personal relations, trinkets, and plants to personalize their workspaces whereas men are interested to use achievement-related and sport-related items. According to another research, the employees who had highest status and best private offices in organizations tended to personalize their place the most. In this condition, researchers did not found any differences between men and women (Wells, 2000).

Other researches proved that the items which employees use for personalize the workspaces reflect their characteristics such as ambitious, outgoing, easy-going, being family-related, busy, successful, or fun. Dinç (2009) found desk placement as one of the physical marking, which employees use to display their characteristics in private offices. According to his study, in the situation that desk is attached to the wall by longer side, individual tend to give full concentration on work, this desk position causes major postural change during conversations, and show that individual tend to have short conversation with visitors (type 1). When desk is attached to the wall by shorter side, provides minor postural change for conversations and longer face-to-face relations with others (type 2). Finally, when the desk has not any attachments to the wall shows the individual gives much more priority to visitors (type 3) (Dinç, 2009). Type 1, 2, and 3 are illustrates as simple sketch in figure below.

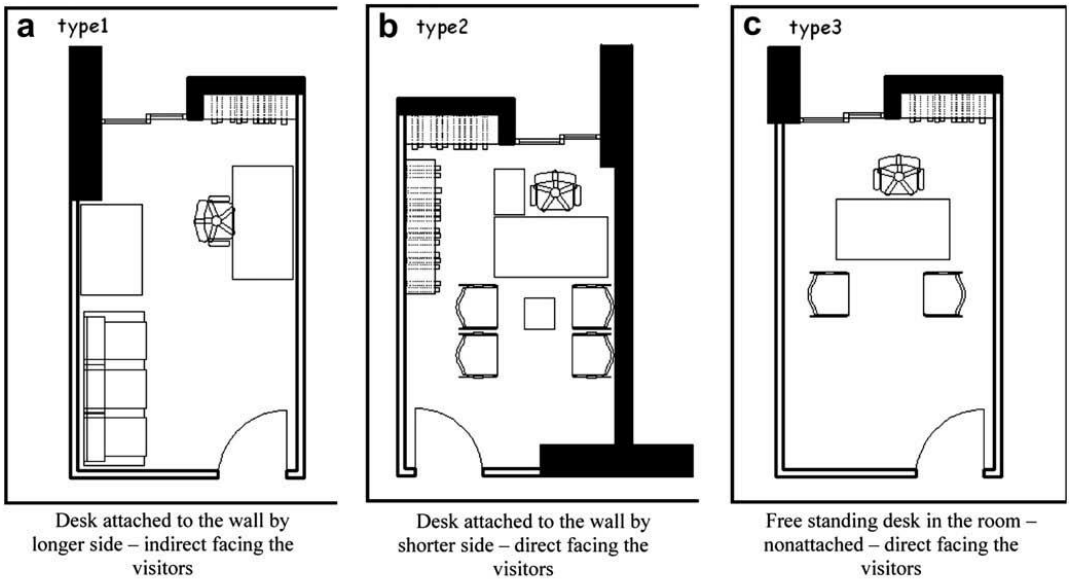


Figure 19: Employees' three different desk-positioning preferences in closed offices (Dinç, 2009)

Hartjes (2009) investigation show that if workers were satisfied about the office arrangement, they personalize spaces less than when they complained about the design of space (Brunia & Hartjes-Gosselink, 2009).

Although, organizational members determine their territories by marking physical objects, other members "may disagree about who has ownership over what object" (Brown et al., 2005 p.7) or in some organizations the territory boundaries may have overlapping. In this situation, members may encroach to individual's territories and create a conflict in organizations. Lyman and Scott (1967) identified the act of invasion on others territories as "infringement" (Lyman & Scott, 1967 cited in Brown et al., 2005).

In summary territorial behaviors, have four types that include constructing or identity-oriented marking, communicating or control-oriented marking, maintaining or anticipatory defense, and restoring or reactionary defense. In addition, territorial behavior is the process of marking and identifying, social and physical objects by individuals in

order to feel ownership and display their identity. Large numbers of scholars proved that determining territory in work environment has positive effect on human well-being and generates opportunity for workers to improve the level of privacy in their workspaces.

3.2 Personal Space

Personal space or interpersonal distancing is the basic behavioral mechanism that individuals use as a communicational tool to attain appropriate level of contact and maintain optimum level of privacy. The personal space and personalized space are two different implications, which are used, interchangeably in everyday language (Lang, 1987). Personal space refers to a distance that individuals maintain among themselves at the time of communicating (Hall, 1966); whereas the personalized space refers to a specific area of built environment which individual marked as his/her territory (Becker, 1991).

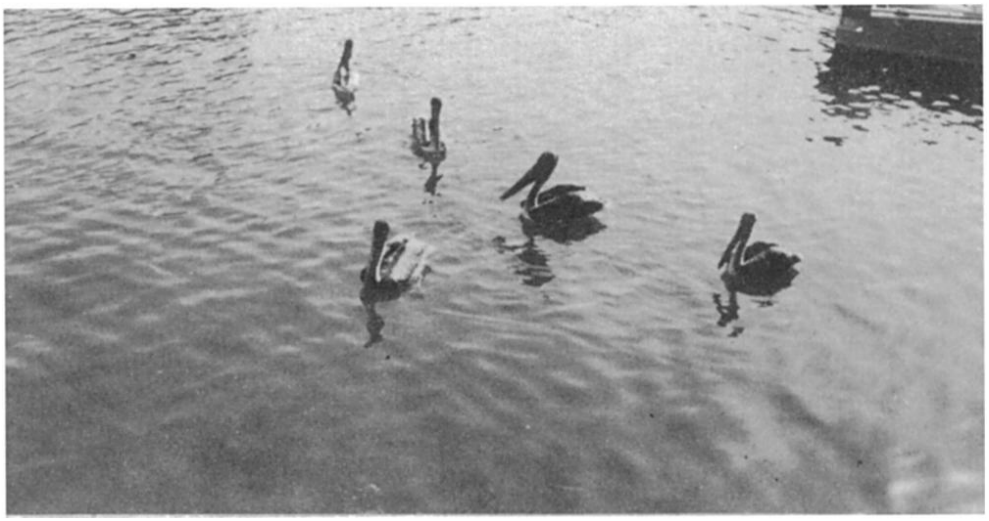


Figure 20: Personal distance in pelicans (Hall, 1968)

Sommer (1959) distinguished personal space from territory. The most significant difference is that personal space is transportable and is attached to individuals while territory is fixed in place. Moreover, the boundaries of territories are visible to others

while the boundaries of personal space are not visible. The center of territory is the individual's home, but the center of personal space is individual's body.

Edward, T. Hall defined personal space as an invisible three-dimensional zone around a person, this invisible bubble allows individual to regulate his/her interactions with others. Personal space is fluctuating; and is difficult to measure. Individuals become aware of personal space around them by feeling of malaise or irritation when another person enters the space (Hall, 1959 cited in Beaulieu, 2004).

Evans and Howard (1973) claimed that the size of personal space or the distance people maintain between themselves is different among people with various cultures and sub-cultures. On the other hand, the environment forms the human growth process and they learn how to act and regulate interpersonal interactions by learning spatial cues. Furthermore, the distance that individuals make between themselves has two functions: communication with others or protecting themselves from others (Bell, et.al. 1996 cited in Gharaei & Rafieian, 2012).

Hall (1968) pointed that there is no fixed amount of interpersonal distances in individuals relations, which is universal for all cultures. One of the complexities in determining personal distance is the fact that individuals are unable to describe how they regulate distance while each group of people with various cultures set distances in their own way (Hall, 1968).

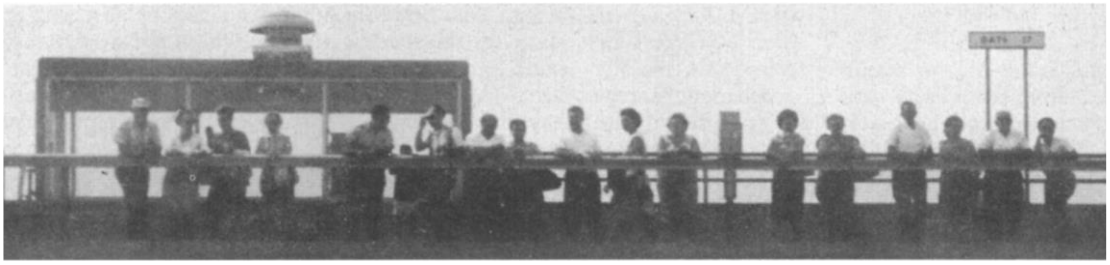


Figure 21: Individual distances between Italians in the Rome airport (Hall, 1968)

Except culture, the interpersonal distance among people depends on amount of intimacy between people and the size of space that is available. Moreover, gender, age group, activity, region, affiliation, role, setting, social class, and culture determine the amount of distance between individuals (Freedman, 1975 cited in Beaulieu, 2004).

Bell, et al. (1996) pointed that the status of people in society has especial effect on the size of personal space. People with high status, high sense of confidence and independence, and with a sense of vulnerability and anxiety determine longer personal distance with others. They also claimed that the size of personal space or personal distance among individuals would be increased in the process of human growing (Bell, et.al. 1996 cited in Gharaei & Rafieian, 2012).

Series of researches which are conducted in open-plan office layouts proved that the minimum space in order to maintain personal space in these offices should be more than arms' length (Cohen & Cohen, 1983).

Hall (1963) investigated that finding personal space size is more important in design of fixed furniture such as seating design of parks, airports, and theaters. In the situations that people are able to move furniture to achieve proper distance and in situations where unwanted intrusion of personal space is tolerated, understanding personal space is less

important. The examples of these situations are elevators, subways, counters at the restaurants, and theater foyers (Hall, 1963 cited in Lang, 1987). Hence, Sundstrom suggested that the seating in the work environments should be movable since individuals be able to control their distance with other people in seating arrangements of work environments (Sundstrom, 1985 cited in Kupritz, 2000).

Consequently, personal space is one of the behavioral mechanisms that include the specific distance between people for regulating interactions and achieving desired level of privacy. There are no physical signs and universal agreement for personal space size and it is different among different group of people.

3.3 Crowding

Crowding is a feeling that may be perceived due to the lack of privacy regulations. Crowding is a complicated concept which happens in different circumstances. It can be claimed that crowding takes place when people are asking for more physical space, or their way toward a specific goal is blocked, or when their territory has been invaded. Crowding is an intrapersonal process that happens even in small groups in which people possess mutual relations. Altman (1975) claims that crowding is a subjective and psychological experience that is associated with a feeling of lack of control over the physical environment. Actually, crowding is the consequence of space shortcoming. He believes that crowding occurs when the level of social contact exceeds what is desired (Altman, 1975).

Environmental psychologists find that many factors led some individuals to feel crowded and others to feel uncrowded, even in the same objective setting. For example, certain personal characteristics are associated with a lower tolerance for proximity to others. In

addition, certain physical and social situations lead to the experience of crowding by some individuals but not the others (Gifford, 2002). A major task of researchers is to identify the personal (personality and attitudes, psychiatric status; preferences, expectation, and norms; gender; mood; culture and community size), social (interpersonal similarity; provision of information and behavior of others) and physical variables (scale; architectural variations; place variations and weather) that lead individuals to label and experience crowded. According to Gifford (2002), figure below is a basic model of crowding.

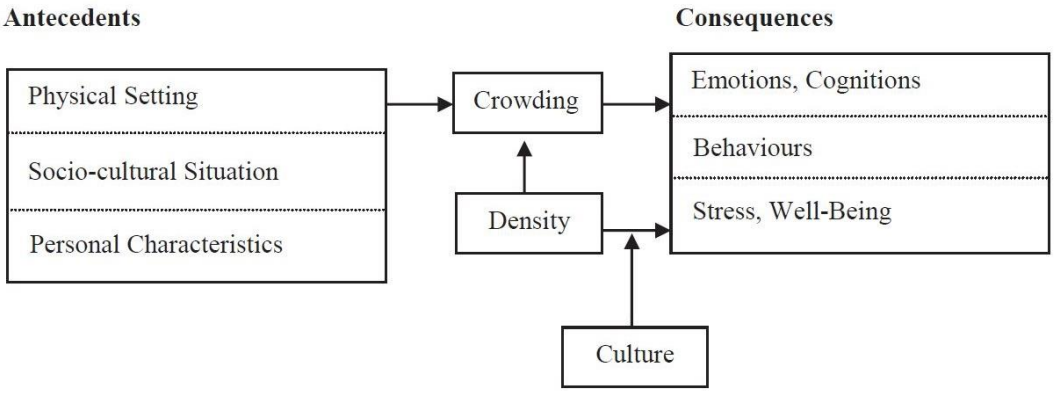


Figure 22: Basic model of crowding (Gifford, 2002)

Stokols (1972) proposed the differences between density and crowding, density is the number of people in every module of space that is measured by physical scales, while crowding is a subjective and psychological experience which is related to human feeling about lack of control over their location. Crowding occurs when the amount of space, which she or he desires, is less than the existing space. Density is defined as an essential condition for crowding not a sufficient condition. In high-density conditions where spatial limitations exist, people may feel privacy invasion. On the other hand, individuals do not always experience crowded in high-density situations. For instance, in social encounters

such as sporting events or concerts the density is high while people do not feel crowded. These amounts of density generates excitement in human body (Stokols, 1972).

Crowding is divided into two different groups; social and spatial. Physical factors may lead to the feeling of space shortcoming in spatial crowding. Social crowding is the consequence of presence of exceeding intrusion to the personal space. Increasing the number of people leads to the social crowding in the condition that the amount of space remains constant and changing the amount of space leads to the spatial crowding in the condition that the number of people remains constant (Gifford, 2002).

Regulating privacy in densely populated areas is difficult for the individuals. Therefore effort for obtaining privacy may often fail in crowded physical environments (Kaya & Weber, 2003).

Privacy is another human behavior that is placed in the center of them. All these mentioned behaviors are directly related to the concept of privacy and privacy regulation in workspaces. As the emphases of this study this on privacy regulations in the workspaces this concepts will be discussed in detail in the coming chapters.

Chapter 4

PRIVACY

4.1 Privacy Definition

The concept of privacy is utilized in many disciplines and is recognized as one of the significant concepts in work environment that has direct effect on workers' behavior and their physical and mental health. Hence, in this part of research, a description about the definition and dimensions of privacy in different perspectives will be presented.

Other than the dictionary definitions, the terms privacy is defined more comprehensive in different scholars' perspective in fields of architecture, psychology, sociology, etc. Bailey (1979) claimed that definition of privacy is different in various fields. In philosophical view, privacy is an essential part of human existence while psychologists emphasize the value of privacy to individuals' development and preservation. In addition, sociologists focus on the significance of privacy in sustaining human relations and intimacy and political scientists and lawyers see it as foundation of human right (Bailey, 1979 cited in Newell, 1995). Moreover, several authors such as Westin (1967), Pastalan (1970), Fischer (1971), Kelvin, 1973 and Margulis (1977) believed that development of individuals and their environmental setting have changed the definition of privacy during the years (Newell, 1995).

While privacy has multidimensional definition, there is one thing in common in all definitions of privacy and it is individuals attempt to control their interactions with others

(Lang, 1987). Additionally, defining privacy as a phenomenal state which removes individuals from the presence of others is not correct definition for this term (Pedersen, 1997).

Due to achieve the purpose of research, the literature survey is focused on the theories of environmental psychologists and social psychologists about privacy. Irwin Altman as the most well-known environmental and social psychologist has been defined privacy as an interaction control process that means individual regulate the type of interaction, the case of interaction and the length of it (Altman, 1975). Generally, individuals' social interaction is the heart of his theory and the environment plays an important role, which let individuals to regulate privacy. Altman theory about privacy is investigated in chapter three part four with more details.

Studying on privacy dimensions is important because invasion of individual's privacy put person on the emotional stress and initiates conscious and unconscious behaviors to create personal boundaries(I. Altman, 1977). In this situation, individuals represent types of avoidance behaviors such as move away from the invasive, increase interpersonal distance, reduce visual contact by reorientation of the face or body, and in the worst case prefer to retreat to other environment. (Fried & DeFazio, 1974; Sommer, 1969 cited in Pedersen, 1997). These antisocial behaviors and aggression are the results of individuals' failure to achieve desired privacy (Glaser, 1964; Heffron, 1972,Pedersen, 1997).

In the present study, the term privacy and its dimensions are viewed as a social need of human beings and are investigated based on Altman, Westin, Rapoport and their followers' theories. The definition of privacy in social behavior's field typically emphasizes on three themes: regulation of interaction, retreat from people and control

over information (Kupritz, 1998). Privacy theories in this field propose individual's self-identity as one of the main function of privacy (Altman, 1975). Individuals create personal boundaries such as visual and acoustical barriers in order to have confidential conversations (Sundstrom, Burt, & Kamp, 1980). Moreover, Altman (1975) emphasized that individual needs privacy to optimize social contact and to avoid crowding (Altman, 1975).

Using term privacy in workplaces generally focuses on regulation of relations, which includes both retreat from people and information management. In other words, staffs need privacy to have control over their information and be able to regulate their interactions with other staffs and customers (Sundstrom, 1986 cited in Kupritz, 1998). Accordingly, based on this particular definition about privacy, work environments should design in the way that provides optimum level of interactions among workers.

4.2 Concepts of Privacy and their reflection on office space

Different researchers in various fields described the concepts of privacy in different way. In this part of research, privacy concepts are defined based on Burgoon (1982) and Parrott (1989) perspectives. They defined four dimensions for privacy, which includes physical, psychological, informational, and social privacy (Leino-kilpi et al., 2001). In the following section, the definition of these dimensions has been examined.

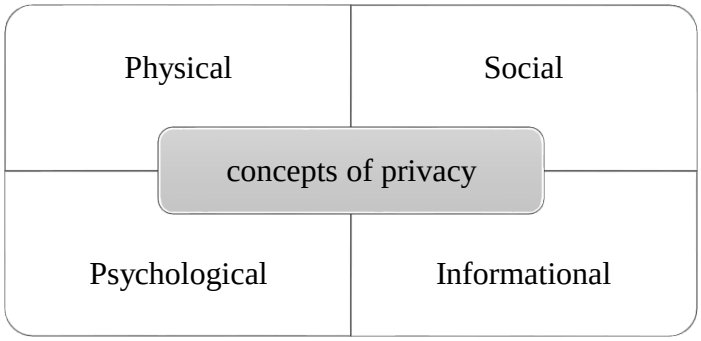


Figure 23: Privacy concepts

4.2.1 Physical Privacy

Physical privacy refers to the physical or architectural features of environment, which provide visual and acoustic isolation for people in order to enhance their level of privacy (Sundstrom et al., 1980). Acoustical privacy and Visual privacy are two implications that are related to physical privacy. Acoustical privacy is defined as isolation from environmental noise (Sundstrom, 1986 cited in Kupritz, 1998). Speech or conversational privacy is a subset of acoustical privacy, which is defined as ability of person to hold conversations inside the workplace without being overheard by individuals outside the workplace. Based on Newsham's (2005) reports, providing acoustical privacy for workers are the most significance indicators in the office buildings. He examined that majority of office workers spent their time for doing their individual's work, which need to concentrate without disruption. Another part of their time is spending to perform conversation, which they would choose not to be overheard (Newsham, 2005 cited in Ding, 2008).Boyce (1974) found telephone ringing, people talking, air conditioning, and office machinery as the main noise disturber in open plan offices (Boyce 1974 cited in Yildirim, Akalin-Baskaya, & Celebi, 2007). Hence, acoustical privacy would be in ideal level when individuals are able to keep their conversational noise inside of workspace and control the background noise (Sundstrom, Herbert, & Brown, 1982).

Moreover, numbers of researches have examined how to enhance the degree of acoustical privacy by using technical terms. Articulation class (AC) rating, Noise Reduction Coefficient (NRC) and Sound Transmission Coefficient (STC) are some technical terms that are used for evaluating the amount of noise in indoor spaces (Rubino, n.d.).

Visual privacy is another indicator of physical privacy which, is defined as isolation from outside intrusion (Sundstrom et al., 1982). Close-plan offices with four full height walls

and a door have maximum amount of visual privacy for workers. In open-plan layouts, system furniture plays an important role in perception of visual privacy in workplaces, hence doing investigation about its design is necessary(Birnholtz, Gutwin, & Hawkey, 2007).

Daroff and Rappoport (1992) recommended the optimum height of partitions for achieving maximum level of visual privacy in open-plan work environments as 1.27-1.32 meter for high partitions in seating position and 1.67–1.77 meter for standing positions (Daroff & Rappoport, 1992 cited in Birnholtz et al., 2007). In addition, Vischer (1989) claimed 1.52 meter height for partitions as minimum height to maintain visual privacy (Vischer, 1989 cited in Birnholtz et al., 2007).

The amount of physical enclosure of workspaces is other factor that affects the level of physical privacy. Sundstrom's (1980) series of studies demonstrated that privacy is positively linked to the number of enclosed sides of the workplace and the existence of a door. Consequently, a workplace with soundproof floor-to-ceiling walls and lockable doors represents a high level of physical privacy while a large undivided space occupied with number of people would embody less degree of privacy (Sundstrom et al., 1980).

The lack of physical privacy in workspaces causes a stressful situation and emotional exhaustion for employees and decrease their job performance and satisfaction. Moreover, low architectural privacy has negative effect on workers' interactions in work environments (Yildirim et al., 2007).

4.2.2 Psychological Privacy

Psychological privacy is another dimension of privacy, which has been defined by many scholars. Psychological privacy pertains to the ability of individuals to control how much information about them is transferred to others and to control amount of input information from the others(Altman, 1975). In other words, based on this concept of privacy, individuals try to control their social contact with others in order to maintain optimum level of social interaction. Consequently, people would have dissatisfaction from being in circumstances, which deviate from what a person perceives optimum level. Sundstrom (1980) investigated that too little social interaction would make feelings of isolation and too much would produce crowding (Sundstrom et al., 1980).

The scholars show an association between architectural and psychological privacy. Evidence for this comes from Sundstrom's (1980) research on correlation of architectural privacy and psychological privacy. These researches were conducted among three groups of employees with different job types and job complexity. These three groups of participants were included administrative employees worked in conventional closed offices, clerical employees worked in open-plan offices, and both clerical employees and individuals with complex jobs. The results proved that low level of architectural privacy provided less level of control over access for staffs accordingly, employees feel less psychological privacy. The research also examined that the workers who worked in less level of physical privacy had less satisfaction through their workspace and their job. While lack of psychological privacy had negative effect on workers' communication in complex job, it had less effect on staffs' communication in routine jobs (Sundstrom et al., 1980). In the other study, Geen and Gange (1977) found that the non-private offices had have positive effect on job performance and social contact of staffs with routine tasks (Geen & Gange, 1977 cited in Sundstrom et al., 1980).

4.2.3 Information Privacy

Information privacy is the other concept of privacy in Burgoon's (1982) framework. Information privacy refers to "the ability to control who gathers and disseminates information about one's self or group and under what circumstances" (Burgoon, et.al. 1989 quoted in Trepte & Reinecke, 2011**,** p: 63). Westin, (1970) defined informational privacy as an individual's right to specify how, when, and to what extent his/her personal information will be released to another person or to an organization (Westin, 1970 cited inLeino-kilpi et al., 2001).

The employees who work in organizations are concerned about the invasive information collection and disseminate by their organizations. To achieve high level of information privacy, organizations' behavior, and practice should be in the way that staffs be aware of how they collect, storage, and disseminate their personal information. In addition, it's the legal right of employees to know how organizations use these information (Alge, Ballinger, Tangirala, & Oakley, 2006). Control over the situations of release, use, maintenance, and disposal of personal data perceived as vital factors in informational privacy (Cho & Larose, 1999).

Demands on data protection become more important by developing information technology and the expansion of using computer (Moehr, 1998 cited inLeino-kilpi et al., 2001). The most significant concern is with access to individuals' data, how data should be protected and with what its contents should comprise. When personal information of employees is obtained against his/her will, informational privacy is lost (Gafo, 1994 in Leino-kilpi et al., 2001). The effect of information technology improvement on workers' privacy level specifically informational privacy and the new issues that information

technology devices brought to the office environment have been analyzed in “privacy in the socio-technical environment” part of this study.

4.2.4 Social Privacy

Burgoon defined social privacy (later referred to interactional privacy), as an individual’s “ability to withdraw from social interactions” (Burgoon, 1982, p:134). He described this kind of privacy as an individual’s efforts to control one’s social contacts with others. Burgoon (1982) emphasizes that control over the participants of interaction; the length of interaction, the frequency of interaction, and the content of interaction are the elements of social privacy (Burgoon, 1982).

Individuals regulate and control their social relations by verbal behavior (using words) and non-verbal behavior (wordless messages).Body orientation and posture, eye contact, proximity, and physiological change are some of the human non-verbal behaviors (Lucas, 2014). Kupritz (1999) categorized these behaviors as behavioral mechanisms that individuals use to achieve optimum level of privacy. Kupritz classification has been studied in chapter four of this research with more details.

Among non-verbal behaviors, proxemics is the most common behavior that individuals use in order to regulate their social relations. The physical closeness between people appropriate to different types of relation is referred to proximity (Hua, 2007). Hall (1966) classified the four distances according to the relationship between individuals, which are included intimate distance, personal distance, social distance, and public distance (Hall, 1966). Following diagram illustrates the range of each distance.

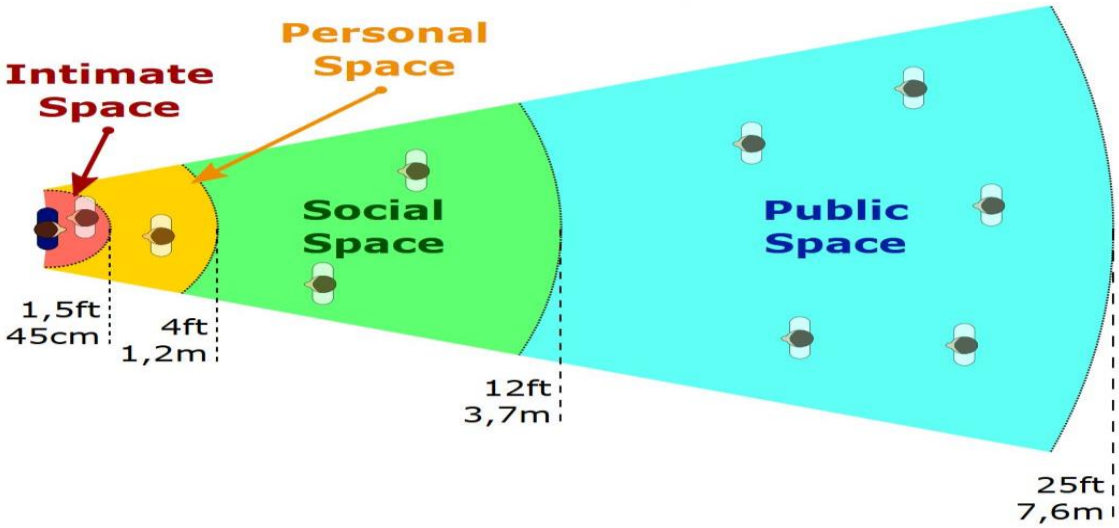


Figure 24: Hall's four distance zones
(https://zackkaylor.wordpress.com/2012/10/30/space-the-final-frontier/)

Accordingly, intimate distance is related to high level of intimacy between two persons. Hall (1966) measured this zone for American up to 45 cm. Moreover, he examined that adults do not use intimate distance in public place while younger people intimately involved with each other on beaches and in cars (Hall, 1966).

Personal distance exists between two persons, who are familiar with each other such as individuals' family, and close friends. Hall measured personal distance between 45 cm and 120 cm. To maintain social privacy in public spaces; individuals tempt to communicate with unfamiliar people in distances more than their personal distance. Hence, there are many studies, which measured personal distance regarding to different genders and cultures. For instance, Studies show that female dyads tent to communicate in more proximate distance than mixed-gender and males interact at the farthest distance of both of them (Aiello & Jones, 1971; Evans & Howard, 1973; Mehrabian & Diamond, 1971; Baxter, 1970; Cook, 1970; Evans & Howard, 1973 cited in Beaulieu, 2004).

Moreover, the cross-cultural studies of Hall (1966) proved that South Americans, Arabs, Southern and Eastern Europeans have smaller personal distances in comparison with Northern Europeans, North Americans, and Asians (Hall, 1966).

In the formal form of communication or business interactions people would manage a distance between 120 cm and 360 cm. This distance is classed as social space. The social distance occurs in the relation of co-workers and boss or at the public event. At the end, when there is no familiarity and intimacy among individuals in public spaces, individuals attempt to have more than 3.6 meters distance with other people. This distance is categorized as public distance (Beaulieu, 2004).

According to Hall's theory that is described above, to provide social privacy in workplaces the distance between co-workers should be more than 120 cm (Hall, 1966). Moreover, many scholars proved that the coworkers' distance is the most significant factor in determining communication between individuals in work environments (Hua, 2007). For instance, Allen (1977) found that there is a indirect relation between distance of staffs and probability and frequency of communication in an open-plan layout . Figure below showsthe reduction of communication when the physical distance increases (Allen, 1977 cited in Hua, 2007).

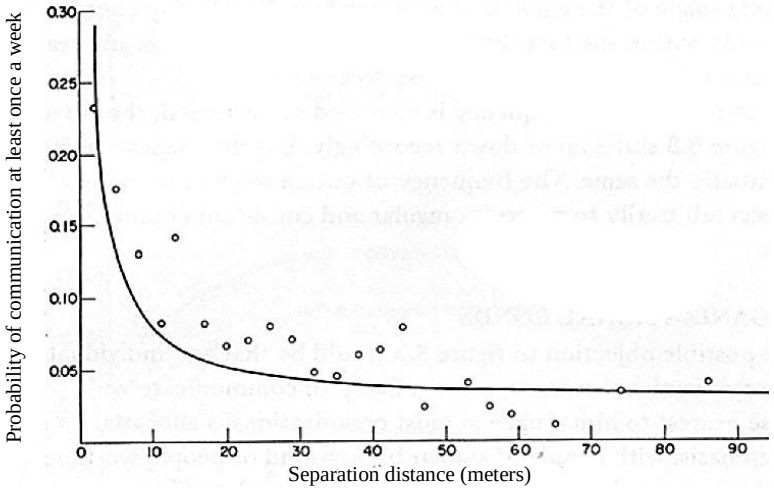


Figure 25: Relation of physical distance and probablity of communication (Hua, 2007)

Based on Allen's investigation, the probability of communication between to workers has highest amount when workers' distance is between 2 and 10 meter. While when the workers' distance increse this probability decrese. Accordingly, in order to improve workers' communication in open-plan layouts the workers' distance should not more than 10 meter (Allen, 1977 cited in Hua, 2007).

Body orientation and gesture is Another non-verbal behavior which individuals use to control their comminication with other people. Many studies demonstrated that the position of people in relation to one another is related to their level of intimacy (Beaulieu, 2004).

Scheflen's (1973) investigation among Americams proved that intimate relations is characterized by a full face-to-face positioning while less intimate relations will aviod face-to-face position. The other studies show that body orientation is affected by culture more than age or gender. Scholars' researches related to body orientation across gender show that women have more direct relations than men (Jones, 1971; Mehrabian & Friar, 1969 cited in Beaulieu, 2004).

4.3 Altman Theory of Privacy

Irwin Altman, like Westin, has large effect on privacy definition, dimensions, and functions. Altman's theory of privacy proposed an original idea, which joins social psychology and environmental psychology concepts. Individual's social interaction is at the heart of his definition about privacy and environment plays vital role in regulating privacy (Margulis, 2003). In his point of view privacy is "the selective control of access to the self or to one's group" (Altman, 1975 p: 24)and "a central regulatory process by which a person (or group) makes himself more or less accessible and open to others"(Altman, 1975 p:3). Privacy has five properties in Altman's theory (1) privacy is a Dynamic Dialectic Process (2) privacy has desired and achieved levels (3) privacy is a non-monotonic process (4) Privacy is bidirectional (5) privacy has behavioral mechanisms. In the following, these properties described with more details.

According to Altman, privacy is a Dynamic Dialectic Process, which is against traditional view about privacy. Traditionally, privacy was viewed as a withdrawal process that people tried to avoid interaction with other people, while in Altman's theory privacy involves a temporal or dynamic process of interpersonal boundary control. Individuals regulate their interaction with others based on their internal states and external conditions. Accordingly, individuals sometimes make themselves open and reachable to other people and sometimes close themselves off from them (Altman, 1977)**.**

Altman differentiates desired and achieved levels of privacy (Margulis, 2003). Desired level of privacy is an individual's ideal level of interaction with others at any particular time. Achieved or actual level of privacy discussed as the actual level of contact, which an individual experiences with others at a specific point in time (Kaya & Weber, 2003).

Opposite to the traditional view that described privacy as a monotonic process (the more private space, is better space for individuals). Altman's theory implies privacy as a non-monotonic process, which has an optimum level (Kaya & Weber, 2003). The optimum level of privacy is when desired level of privacy is equaled with achieved level. Deviation from the optimum level creates unsatisfaction in human beings. In situation that achieved level of privacy is lower than desired level of privacy unsatisfaction is because of crowding. In addition, social isolation will create when the actual amount of privacy is more than desired level of privacy (Margulis, 2003).

According to conceptual model of privacy presented by Altman, privacy involves an optimization process that has an optimum level (desired level = achieved level). Figure 31 illustrates optimization process of privacy that was presented by Altman (1975). The diagram show that the deviation from optimum level of privacy brings unsatisfaction for individuals (Altman, 1975).

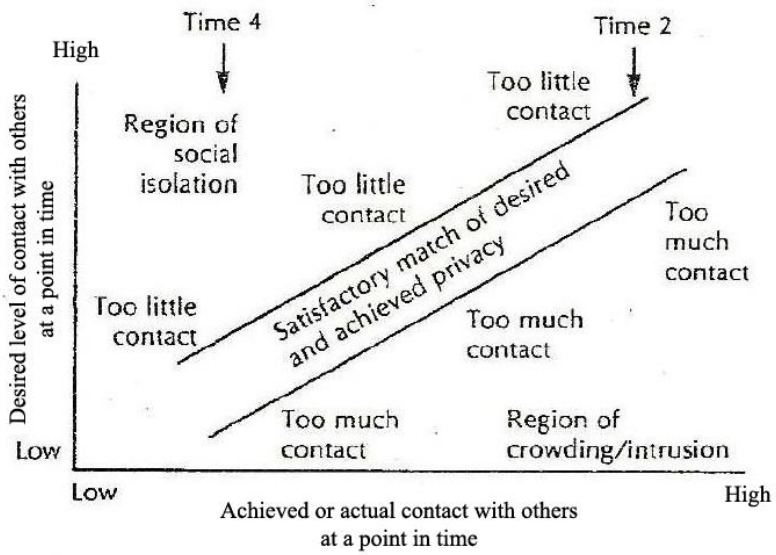


Figure 26: Privacy as an optimization process (Altman, 1975)

According to optimization process diagram, crowding is a deviation from a desired level of interaction in a too much direction, and isolation is a deviation in a too little direction (Altman, 1977). Altman (1975) claimed that crowding is a social situation that is consequent of inapplicability in the privacy regulation. The concept of crowding is complicated, and occasionally crowding and density are used interchangeably. Crowding takes place when people are requesting more physical space, or when their way toward an explicit goal is blocked (Altman, 1975).

Other than crowding, social isolation is the other consequent of inapplicability of privacy in the environment based on Altman's optimization diagram. The middle space in the diagram shows the optimum level of privacy. Individuals feel maximum level of satisfaction when their privacy level is in the optimum level.

In Altman (1975), privacy is bidirectional, including inputs from others and outputs to others. For instance, noise is one of the inputs and oral communication is one of the outputs (Margulis, 2003).

The last properties in Altman theory privacy is viewed as a behavioral mechanism, which individuals use to obtain desired level of social interaction. The behavioral mechanism involves verbal and non-verbal behaviors, territoriality and personal space (Altman, 1977). Altman also presented a model that shows the relationship of privacy with territoriality, personal space, and crowding.

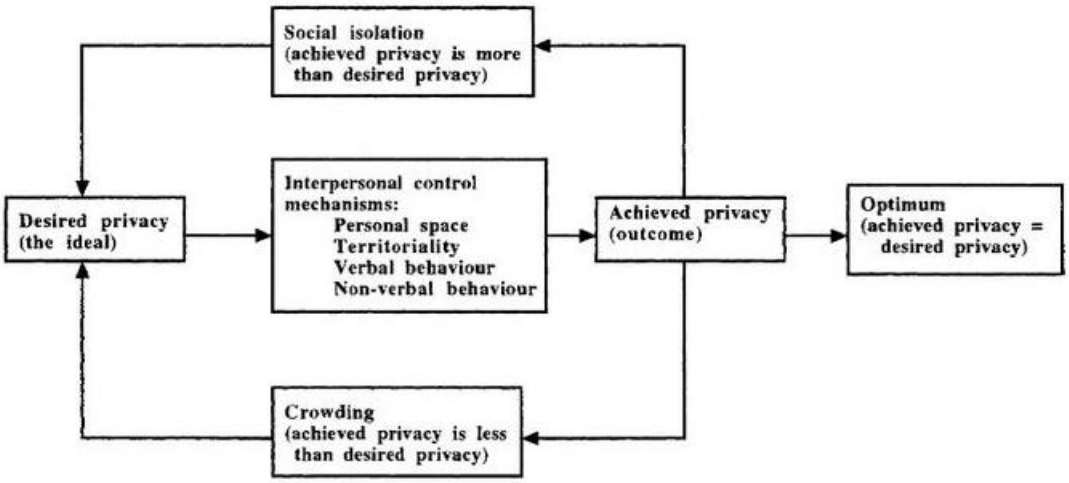


Figure 27: Privacy as a central process in the regulation of space (Altman, 1975)

Based on the model the process of obtaining a balance between desired privacy and achieved privacy will be mediated by the different process, which control access to the self. Included in this will be personal space and territoriality as well as other aspects of communication process. If these operate to produce an achieved privacy, which is less than our desired privacy, we will experience crowding. Alternatively, if our achieved privacy is more than we desire we will experience social isolation, loneliness, and lack of social support.

Altman's theory of privacy has challenged researchers to consider a number of significant aspects of privacy. In his theory, privacy is a social process that has psychological aspects and cultural context. Furthermore, the psychological aspects of privacy include the interaction of people, their social word, and the physical environment. It must be considered that the social phenomena have a temporal nature, which in different situations and time will change (Margulis, 2003).

While in privacy analysis, Altman believed cultural context should be investigated, Westin had another idea one decade before him. Based on Westin's analysis on privacy,

privacy regulation is a universal process that is related to the ability of individual or a group for controlling communication with others, sometimes being close and sometimes being open depending on circumstance (Altman, 1977).

In Altman (1977) analysis, privacy is culturally universal process when involves dynamic, dialectic, and optimization features. Moreover, in terms of mechanisms which individuals use to regulate their social interactions, privacy is culturally specific phenomenon. In other word, the ability of individuals for privacy regulation is universal but from culture to culture, people use particular techniques and behaviors to obtain privacy. Accordingly, privacy is a cross-cultural phenomenon which all cultures have mechanisms to regulate privacy, but the particular pattern of mechanisms is different in each culture. Hence, the patterns or orientations of one culture cannot be used for another one (Altman, 1977).

Some cultures have been described as having either minimum privacy, its members apparently unable to keep from interacting with one another, or as having maximum privacy, with little contact among certain of its members. This is different for culture with maximum privacy.

Therefore, based on Altman's theory, privacy is a social process which human use their particular patterns to regulate their social interactions. His theory has affected the way scholars think about process of regulating privacy and privacy information. There are many researchers, which developed and expanded Altman's theory of privacy. Kupritz's (2000) theory reorganized and extended Altman's privacy regulation mechanisms. In the next chapter of literature, privacy regulation definitions and its mechanisms will be described in different perspectives.

Chapter 5

PRIVACY REGULATION

5.1 Privacy Regulation Definition

As it was described in previous part, Altman (1975) described the concepts of desired Privacy, and achieved privacy to demonstrate privacy regulation process. Achieved privacy has examined as the actual amount of contact with others and desired level of privacy is the ideal level of individuals' contact. The optimum level of privacy exists when the actual level equals with the desired level of privacy (Altman, 1975)or when individuals achieve the ideal level of social communication (Kaya & Weber, 2003). Moreover, in the optimum level of privacy the outputs and inputs of people's behavior in a social situation are in a level that an individual desires. For example, listening to other's conversation is described as an input from others and attending to a discussion, and giving the idea to the subject represents as the outputs from self to others (Lehikoinen, 2008).

The efforts of individuals to obtain this optimum level of privacy are defined as privacy regulation process. Privacy regulation in Altman's perspective is a dynamic (temporal) and dialectic process. It means that by changing the conditions and time the amount of openness and closeness of individual or group to others will be changed (Altman, 1977). Altman believed that individuals regulate their privacy in their environment by using different behaviors, consequently, privacy regulation has behavioral mechanisms (Altman, 1977), which is neither static nor rule-based (Palen & Dourish, 2003).

Altman defined privacy regulation as a network of verbal and nonverbal behavioral mechanisms, which individuals use to achieve desired levels of social contact (Altman, 1977). Using certain sentences to obtain desired level of privacy is defined as verbal mechanism. For example using 'I want to be alone' is used in situations that individual need loneliness. Territoriality, personal space, proxemics, body postures, eye contact, and facial expressions etc. are some examples of nonverbal behavior. People have various behavioral mechanisms depend on circumstances and cultural patterns and their personalities(Altman, 1975).Some of these non-verbal behaviors such as proxemics and body orientations are described in detail in chapter 2 and 4.

Except behavioral mechanisms and cultural mechanisms for privacy regulation, Altman (1975) investigated physical environment as one mechanism that individuals use to achieve desired interactions. Use of fences, walls, doors, and signs to control social interactions are environmental mechanisms in privacy regulation (Altman, 1975). Figure 28 illustrates the privacy regulation mechanisms, which Altman proposed. Based on his diagram individuals regulated privacy by using three mechanisms that include behavioral, environmental, and cultural mechanisms. The small circles in figure below show these mechanisms.

The divisions within circles demonstrate the dialectical concepts of accessibility and inaccessibility. The sign O signifies 'opened' and the sign C is the symbol of 'closed'. Each of segments of circles can be different from time to time or in specific circumstances. It means that in some situations, the amount of openness for environmental mechanism may occupy the whole circle and in other situations, the area of opened (accessibility) can change to slightest part. The nonspecific amount of area emphasizes on dialectical section of privacy regulation (Altman, 1977).

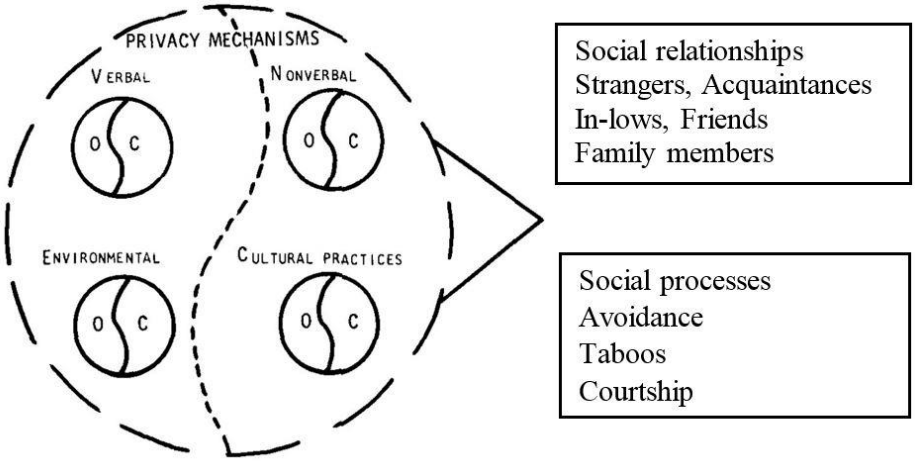


Figure 28: A framework of privacy regulation (Altman, 1977)

Based on Altman's framework, individuals use a mixture of mentioned mechanisms to control social relations in social processes. Individuals' relations are categorized in five groups that include strangers, acquaintances, in-lows, friends, and family members. The social process forms based on individuals' social norms and roles.

In 2000, Kupritz developed privacy regulation theory of Altman. In Kupritz's perspective privacy regulation mechanisms include social mechanism, environmental mechanism, and behavioral mechanism. She separated social mechanism from cultural mechanism. Furthermore, she expanded Altman's behavioral mechanism by adding cognitive behaviors of individuals and also extended environmental mechanism by adding different physical elements and more emphasis on architectural aspects for achieving optimum level of privacy. Generally, Kupritz's framework of privacy regulation operates through the medium of culture within the work environment. While, accommodating the overall cultural context for privacy regulation is not the focus of Kupritz framework, its significance should not be overlooked. In the following section, the role of environmental, behavioral, and social mechanisms in regulation of privacy in work environment and their interrelationships will be examined in more details.

5.2 Privacy Regulators

Over the past 40 years, many studies were conducted on work environment privacy issues. The large amounts of researches on this topic show that privacy is a significant concern for employees and is an essential need of organizations in order to improve their staffs' productivity. Among many scholars that investigated this problem, Kupritz described a conceptual model for privacy regulation to solve privacy issues in the work environment in 2000. The foundation of Kupritz framework is Altman theory about privacy regulation with some differentiations. Firstly, Kupritz investigated privacy regulators in work environment specifically while Altman discussed about privacy regulators and its mechanisms in general spaces. Secondly, in the Altman theory culture is investigated as essential mechanisms of privacy regulation that Kupritz removed this factor in her framework. Her privacy regulation framework consisted of three mechanisms that included environmental, social, and behavioral mechanisms. Figure below illustrated her mechanisms and their interrelationships. Based on Kupritz framework behavioral mechanisms and environmental mechanisms are linked together through using the physical factors and are displayed by organizations and individuals.

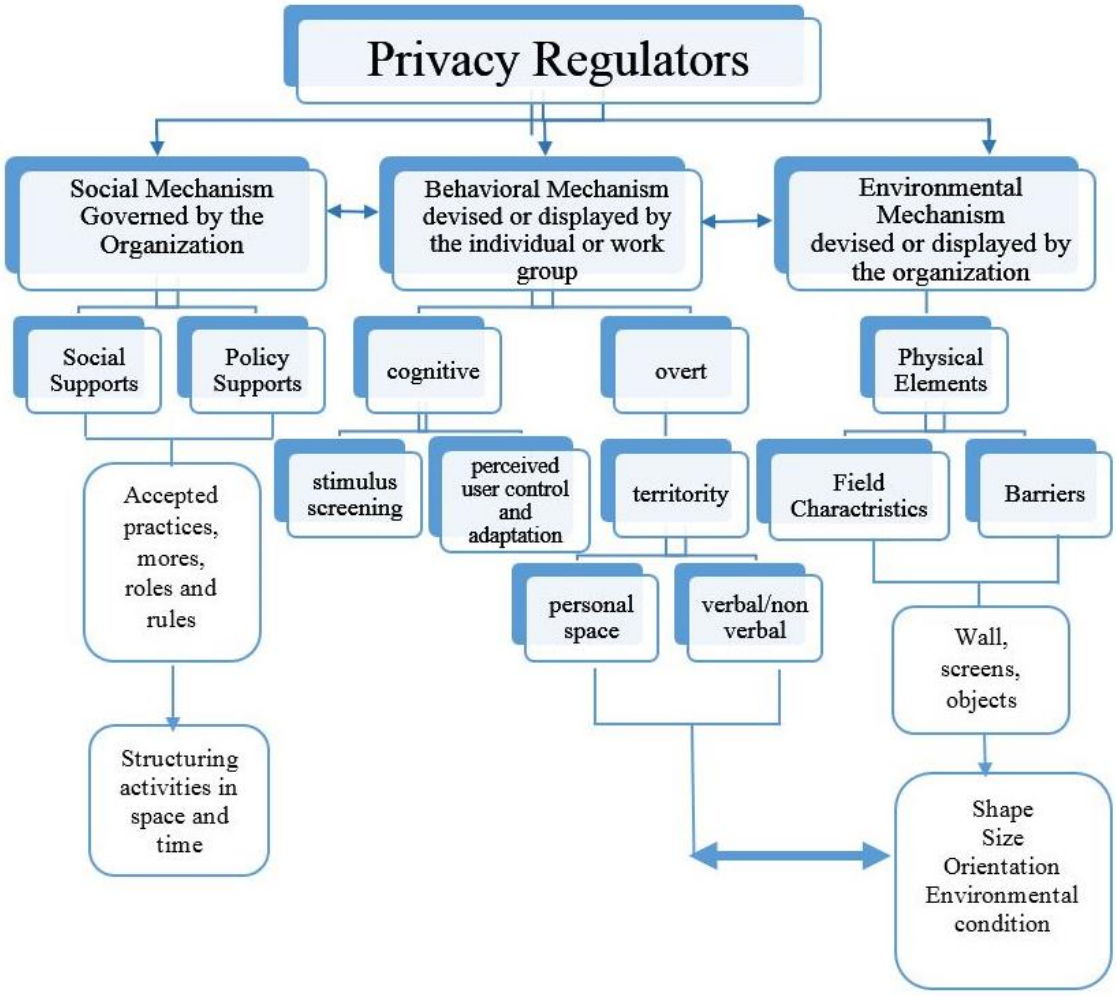


Figure 29: A conceptual model of privacy regulation (Kupritz, 2000)

5.2.1 Environmental Mechanisms

In Kupritz framework, environmental mechanisms are defined as the physical elements that are used in work environments in order to provide optimum level of privacy for individuals and groups of people. Individuals use these physical resources to regulate the amount of their accessibility or inaccessibility with others and to achieve desired level of privacy (Kupritz, 2000).The physical resources for regulating privacy in the work environments are comprised of field characteristics and barriers.

Walls, screens, and objects are defined as barriers in work environments. These elements provide visual and acoustical privacy for workers. Furthermore, the physical boundaries

allow individual and groups to act in the desired way and to discuss subjects freely. To obtain optimum level of privacy the types of boundaries and the amount of enclosures should be investigated in different situations (Kupritz, 2000).

A large body of research is consistent in relation of visual and acoustical privacy with amount of workspaces' enclosures (Kupritz, 1998). Sundestrom et.al (1980) conducted a comprehensive research about the relation of degree of enclosure and visual and acoustical privacy in workplaces. He found that visual and acoustical privacy in workspaces is positively connected to number of enclosed sides and the existence of a door. In addition, in a similar research, Duvall-Early and Benedict (1992) determined that the existence of a door is the best physical feature for obtaining visual privacy. Beside the door, they identified co-workers visibility and co-workers' distance as the most significant workplace characteristics to achieve visual privacy (Duvall-Early& Benedict, 1992 cited in Kupritz, 1998).

Sundestrom (1980, 1982) and Brill (1984) conducted researches in early 1980srelated to the ranks of office workers and amount of enclosure. The results proved that workers with high ranks need greatest amount of privacy. They also found that in open-plan cubicles, the height of partitions and the number of them is directly related to level of enclosure or accessibility. Generally, the number of partitions positively is linked to the workers' perception about privacy regulation (Sundestrom et al., 1980, 1982).

In another research, Kupritz found that partitions with 1.5 meter and 2.1 meter height, floor to ceiling solid walls as the most important physical elements that aerospace engineers needed for obtaining optimum level of privacy in their workspaces. Having a separated meeting room for doing group activities and a partition with mini-blinds

window were other preferences of them. She mentions that while preparing private offices with solid walls and a door is greatest pattern for visual and acoustical privacy. And in some situations using partitions can provide sufficient privacy for workers (Kupritz, 1998).

Kupritz (1999, 2001) conducted two researches among 24 American administrators with different ages to investigate the physical features and design facilities they needed to obtain the optimum level of privacy. The findings indicate that age variety did not influence on workers perceptions about the overall types of design features and physical elements for achieving optimum level of privacy (Kupritz, 1999, 2001).

Except types of barriers that should be investigated in different work environment in order to find appropriate one, the characteristics of these barriers also should be analyzed. Kupritz described field characteristics as one of the environmental regulators that evolve from the layout of barriers. She also states that each field alters its privacy by changing its physical characteristics. Some of these physical aspects are shape, size, workplace orientation, and environmental conditions (Kupritz, 2000).

The shape of layout has effects on individuals' visual privacy and their relationships. Ziesel study showed that individuals regulate privacy in a square space easier than a round shape one. Moreover, people obtain more privacy in the corners of square shapes (Zeisel, 1984). Robson (2008) conducted a research among 487 college students with the ages of 18 to 26 years old. Robson chose a square hypothetical architectural layout for this study, which has been illustrated in figure 29. He defined seats along the perimeter of room as anchored position, accordingly the tables in the middle of layout categorized as unanchored seat position. Based on the research's result participants prefer to use

anchored position when they need more privacy. Unanchored tables offered weakest opportunities for utilizing the environment for privacy regulation (Robson, 2008).

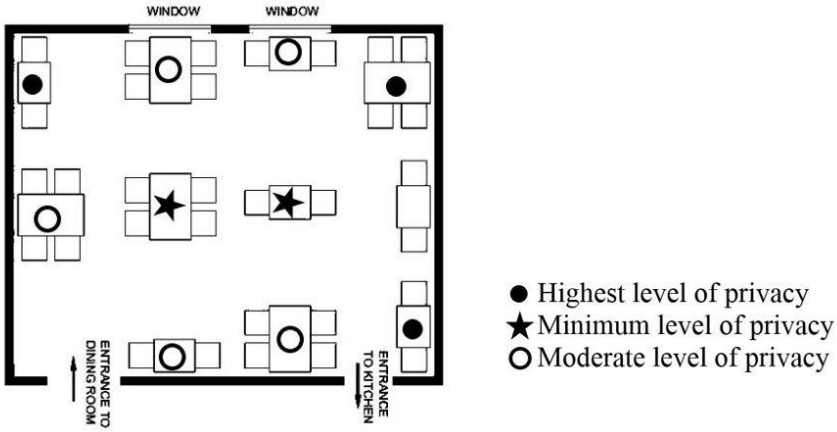


Figure 30: Hypothetical architectural layout proposed by (Robson, 2008), legend added by author

The size of work environment is another field characteristic. The workspace size is defined as the specific amount of space that is belonged to workers (Oldham & Rotchford, 1983). Lack of optimum area for each occupant, proportional to their tasks can create crowded situation for workers and accordingly decrease the level of privacy in workplaces (Kupritz, 2000). Oldham and Rotchford (1983) examined that the terms workplace density should be distinguished from the workplace size. Workplace density is identified as the average amount of space for each occupant in work environment while workplace size is the personal work area size.

Studies proved that in order to avoid feeling crowded by workers in workspaces, the smallest offices should have enough space to facilitate with a sufficient desk surface and a conversational area. Furthermore, the large offices that typically are belonged to executives should be divided into three areas which include a work surface area usually

a large desk, an informal conversational area comprising of a couch, and a conference area involving a table with minimum six chairs (Tim & Davis, 1984).

Orientation of workspaces is one of the most significant characteristics of setting that have direct influence on level of privacy in work environments. On the other hand, the orientation of workplaces and the placement of physical elements in work environment are more important than barriers in privacy regulation. Kupritz (1998) investigated that having minimal traffic routed in work areas and being away from traffic flow as the most important field characteristics, which workers need to achieve optimum level of privacy. Based on her research the workplaces near the meeting areas such as coffee areas, restroom facilities, and mail areas generate acoustical distractions and enhance traffic flow in the workplaces (Kupritz, 1998).

Moreover, in the research of Wang and Boubekri (2011) workers' seating preference (the way that workers desire to arrange their desks) has been investigated through a specific closed office layout. Figure below illustrates the workers' favorable zone for managing work desk. In this research, as is shown in figure, most of the participants lactated their desks in front of workspace entrance in the way that have window view. Participants in this study had three main reasons for choosing this zones that included have outdoor view, visual privacy, and more control over workspace (Wang & Boubekri, 2011).

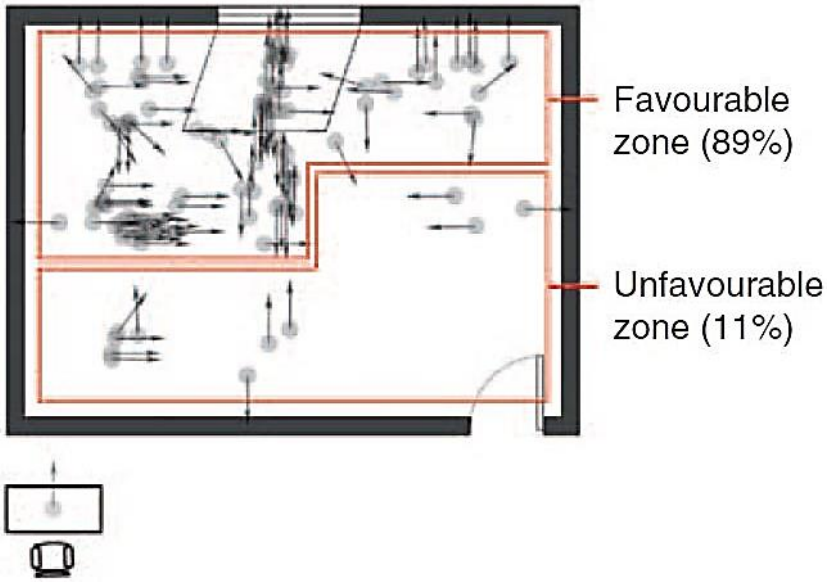


Figure 31: Workers' preferred sitting positions for the work desk (Wang & Boubekri, 2011)

Although having window view was as an important factor to arrange work desk for majority of subjects, they choose having view of entrance in the situation that they are not able to have both. Wang and Boubekri also suggested appropriate and inappropriate arrangement of desks for hypothetical open-plan layouts. Figure 37illustrates these arrangements. The left (a) arrangement for desks does not provide sufficient privacy for workers because the entrance of each cubicle is on the path of room circulation. Moreover, workers have less level of control since they cannot see the doorway and others in the workspace. In contrast the right (b) arrangement provide more privacy and control for occupants as each person has a private workspace far from room circulation and the entrance is visible for them. In addition the distance of cubicles or the proximity of workers increase in second desk arrangement that help to enhance workers' privacy level (Wang & Boubekri, 2011).

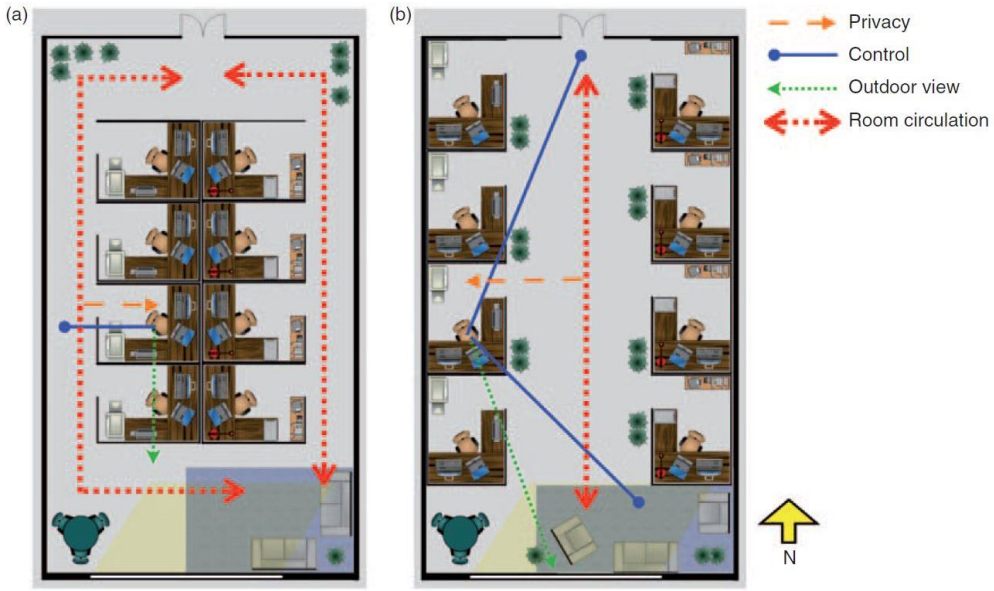


Figure 32: Appropriate (b) and inappropriate (a) desks arrangements for an open-plan office(Wang & Boubekri, 2011)

Noise is another environmental condition that impedes privacy regulation through conversational privacy and environmental background noise (Kupritz, 1998). To improve acoustical and speech privacy in open plan offices electronic sound masking systems is introduced. Sound masking system involves of a series of speakers, which distribute an engineered background sound. The sound of this system is like softly blowing air and usually installed above the suspended ceilings. In other word the system covers up the unwanted noises in work environment and cause workers' confidential discussions not overheard by others (Moeller, 2008).

Air quality is one of the environmental conditions that affect the perception of visual and acoustical privacy. In the work environment with appropriate ventilation systems, the high level of air quality exists and the olfactory context mediates. Furthermore, a large body of researches investigated the positive influence of pleasant fragrances on human behavior (Baron & Thomley, 1994). In the recent decades, many researches are conducted in order to decrease the amount of environmental contaminants and improve the quality

of air in indoor spaces. In the information age, this topic became more important since using the technological devices generated hazardous contaminants in indoor spaces (for more information see Sick Buildings Syndromes (SBS) researches).

Based on Kupritz's categorization about environmental privacy regulators, choosing appropriate type of barriers and investigating the best characteristics for workplaces setting can be improved the privacy level in organizations. Generally, organizations should provide suitable environmental mechanisms for their workers in different situations. Moreover, arrival of information technology devices into work environment had strong influence on workers' perception about environmental privacy regulators. While there are some researches related to mentioned topic, the amount of these studies is few in information era and new generation of workers. Consequently, finding appropriate environmental privacy regulators need extensive researches in information age in order to help designers for creating supportive work environments.

5.2.2 Behavioral Mechanisms

Except environmental mechanisms that workspaces' designers create for workers in organizations in order to enhance privacy level, behavioral mechanisms are another factors that workers use in their work environment for the same aim. Based on Kupritz conceptual model individuals have two different kind of behaviors that use in work environment to obtain optimum level of privacy. These two types of behaviors include cognitive and overt behavior. Figure below portrays the behavioral mechanisms identified by Kupritz (2000). In the following sections, the behavioral mechanisms are described in more details.

5.2.2.1 Overt Behaviors

Kupritz identified overt and cognitive behaviors as behavioral mechanisms in work environment. Overt behaviors are those behaviors that are observable by others. Individuals use some overt behaviors such as territoriality (territorial behavior), use of personal space, and verbal/nonverbal behavior to regulate privacy in their workspaces (Kupritz, 2000). The terms territoriality or territorial behavior and personal space as a implications that are linked with privacy were described in chapter 3 of research. In addition, a comprehensive investigation about verbal and non-verbal behaviors are conducted in chapter 4 as a social factors that individuals use in order to regulate their interactions with others.

In sum, Altman and Chemers (1980) state that individuals use physical elements and areas in the environment to demonstrate their accessibility to others. These objects and spaces enable workers to control their level of privacy through their own locations (Altman & Chemers, 1980). Hence, Kupritz (2000) indicated the interrelationship between overt behaviors and physical elements in her conceptual model.

5.2.2.2 Cognitive Behaviors

Cognition or cognitive behavior is defined as humans' conscious or preconscious thinking processes that allow them to understand the world. In fact, cognitive behaviors are mental activities of individuals to become aware of their surroundings. Cognition comprises of taking required information from the environment, analyzing that information, and creating a plan of action based on that synthesis. Environmental, biological, social, experimental and motivational factors influence on the process of human thinking and perception (Ronen & Freeman, 2007 cited in Walsh, n.d.). Kupritz (2000) mentioned the perceived control, adaptation, and stimulus screening are the most important cognitive behaviors that individuals use to achieve optimum level of privacy (Kupritz, 2000).

Adaptation is a result of psychological, physiological, and cultural processes in human body. Baum, et.al. (1981) mentioned that the psychological and physiological process of adaptation have limitation and occur over the time (Baum, et.al. 1981 cited in Hua, 2007). Sundstrom (1985) investigated that level of adaptation will be altered in individuals through the changes in psychological standards of them. In the process of changing adaptation-levels, workers re-adjust perceived quality of work life standards. For instance, the new office worker may perceive that the work environment is noisy at first days of working, but after a while, his/her standard of reference possibly will change; accordingly, she/he perceives office less noisy but would never perceive the office as a quiet place (Sundstrom, 1985 cited in Kupritz, 2000).

The cognitive behavior of perceived control is another factor that helps workers to regulate privacy in work environment. Individuals need to be able to control their work life to maintain self-identity. This implication is closed to psychological function of privacy or autonomy (Altman, 1975). O'Neill (1994) investigated that giving employees more control over their workstations by re-adjusting workstations arrangements reduces their stress and increases motivational performance (O'Neill, 1994).

Mehrabian (1976) examined stimulus screening as one of the individuals' cognitive behaviors that helps them to regulate privacy. He defined stimulus screening as the amount of data that individuals screen and receive from their environment in order to decrease the environmental load (Mehrabian, 1976)

Based on kupritz (2000) conceptual framework individuals modify their work environment by using overt and cognitive behaviors in order to achieve optimum level of privacy. While workers behaviors may change physical elements of work environments,

the behavioral mechanism are linked to the environmental mechanisms. Social mechanism is the last factor that helps organizations to enhance privacy level in workspaces. In the next part, this mechanism has been studied.

5.2.3 Social Mechanisms

Based on Kupritz's (2000) conceptual framework about privacy regulation in work environment, social mechanisms are one of the influential factors that help organizations to improve privacy level in workspaces. In her perspective, social mechanisms include policy and social supports that organizations use to provide employees privacy needs through establishing rules, norms, and customs (Kupritz, 2000). In addition, organizations' supports facilitate privacy regulation over the structuring members' activities that they will or will not do in specific space and time(Becker, 1991).

Most of workers in an organization willingly understand these supports and use them to regulate privacy in their workspaces. Moreover, the organization's policies and rules make some patterns for members in order to determine what they will or will not do there(Becker & Steele, 1995). The social mechanisms in organizations are critical to the development of workers cohesion and consequently group task performance (Sundstrom, 1987).The organizations' cultures and subcultures have dominant impact on the amount of worker's autonomy through the established roles (Harding & Livesay, 1984 cited in Kupritz, 2000).

Social mechanisms used for regulating privacy in organizations are categorized in to two parts; policy supports, and social supports. Policy supports are explicit and implicit rules that specify appropriate and inappropriate activities that workers must do in each organizations. Kupritz (2000) mentioned that there are two types of policy supports in organizations. Formal policy supports include explicit rules and informal policy supports

comprise of implicit rules (Kupritz, 2000). In recent decades, companies improve their formal policies that comprise of how to manage privacy in organizations (Cohen & Cohen, 1983).

The second type of policy supports involves informal policies that organizations establish to define environmental flexibility and ambiguity. The ability of workers to control office temperature, the adjustability of workspace décor, and autonomy through confidential files is some examples of informal policies (Becker, 1981).

Social supports are the other categorization of social mechanisms, which is defined as informal social norms that indirectly cue what workers should or should not do in a specific work setting. These norms are related to behavioral norms that employees perform through the specific items or setups in work environment, such as the state of office door when the occupant is in the office. The other behavioral norms include how softly or loudly the individual should talk to co-workers or on the phone in the workplace and when is suitable or not suitable to enter someone's workspaces (Steele, 1986 in Kupritz, 2000).

While Kupritz theory about privacy regulators is almost a new theory in this subject, she did not state the impact of technology on privacy regulators in her framework. In order to fill this gap in her theory, the effect of information technology devices on privacy definition and privacy regulators will be investigated in the next part of study. Author tried to find more recent researches related to privacy issues that new technologies generated in work environments and consequently on workers' behaviors and communications.

5.3 Privacy Regulation in Information Age

Arrival of the information age, and using new technology in the work environment brought significant changes in the workspaces in various dimensions, such as organizational structure, outcome, and performance, workers' productivity and collaboration, workers' physical and mental health, etc. Related to the aims of present study, this chapter will investigate the ways that employers and employees use information systems (IS) and information technology (IT) in order to regulate privacy in the workspaces. Moreover, the effect of IT on workers' perception about privacy and privacy definition is discussed in the following parts.

Susan Martin (2009) discussed that managing privacy in the workplace is a complex issue and it becomes more complicated by the widespread of information technologies. Surveillance or monitoring of workers' activities by managers, changing in patterns of workers' communications, and the security and protection of personal data are new concerns that threaten organizations' privacy in information age (Martin, 2009).

Sophisticated technologies with its related equipment enable managers and bosses to monitor every electronic communications and workplace activities of employees without any difficulty. Since 1993 by the development of surveillance technology, many cheap programs allows employees to monitor electronic communication of workers such as incoming and out coming of phone calls and emails, computer files, web-page visits and so forth (Martin, 2009). For instance, very cheap programs can be installed on target PC of organizations, and everything that workers do such as email details and voicemail messages are reported to the employers. Moreover this program is able to retrieve deleted information intact (Froomkin, 2000).

Except monitoring virtual spaces and electronic communications of workers by using software, employees' personal work areas are observed by employers in information age. Closed Circuit Television (CCTV) is the most visible way for space monitoring in organizations. These kinds of digital cameras are able to record and store activities of workers during their office hours. New generations of digital cameras are so small, that can fit in 3 cm by 5 cm spaces; and have unbelievable prices. These two important features of digital cameras make ubiquitous and hidden monitoring affordable and easy to use for organizations. By monitoring all the activities of workers in their workspaces, they may feel uncomfortable and feel that their employers do not trust them. Privacy destroying is the most important effect of installing digital cameras in workspaces (Froomkin, 2000).

While the employers have legitimate needs for monitoring their employees at work in order to avoid crimes and make workspaces safer, the employees also have some privacy rights to be protected from infringement on their private life. In order to solve privacy issues related to workers monitoring some legitimate rights are generated (Martin, 2009).

Consequently, most of the concerns related to destroying privacy related to monitoring are reduced through rights and organizational policies. The other effect of information technology on workers' life in work environment is related to new ways of communication among them. While several authors have noted that information technologies has applied a powerful addition (electronic communication) to organizations' communication that promotes collaboration and information sharing among co-workers, it is clear that the effects of information technology are not positive in all aspects of workers' communication (Huber, 1990).

Recent researches have examined the positive and negative roles that information technology plays in employees' patterns of communication in workplaces. In general, changing from face-to-face communications to the electronic communications is the significant impact of technology on employees' communication.

Replacement of electronic communications with face-to face communication in work environment has several positive effects. For instance, Hiltz, Johnson, and Turoff (1986) claimed that the electronic communication enhanced the overall amount of communication in work environment (Hiltz, Johnson, and Turoff, 1986 cited in Deweett & Jones, 2001). Hinds and Kiesler (1995) discussed that information technology enhanced the potential of communication within and between organizations and reduce the costs of organizations (Hinds & Kiesler, 1995). Huber (1990) suggested that information technology is a variable that is used to increase the quality and punctuality of organization, decision making and intelligence, and promoting organizational performance (Huber, 1990).

Simultaneously the negative aspects of electronic communications appeared in information age. Researchers defined electronic communication as poor communication channels, which do not allow workers to reach "soft" information, "rich" information, and the "meaning" of information, especially in uncertain and equivocality communications. In addition, employees who must solve complex and non-routine problems perform their job better when they have face-to-face communication, and if it is not possible, they must use "rich" communication channels such as telephone. In this situation, using email or other electronic communications are identified as poor channels of communication (Hinds & Kiesler, 1995).

Loss of trust through the reduction of casual conversation is the most significant impact of electronic communications in organizations. In the formal hierarchical communication of workplaces, managers have to employ more control over workers communications and consequently the level of workers' privacy will decrease. Whereas sharing information face-to-face among co-workers can enhance person self-steam, feeling of commitment, and respect from others. Moreover, in face-to-face communication employees have opportunities to personalize the space to obtain more privacy (Deweett & Jones, 2001). In other word, in electronic communications workers are not able to manage their communication trough the environmental and behavioral mechanisms in order to obtain more privacy (Palen & Dourish, 2003).

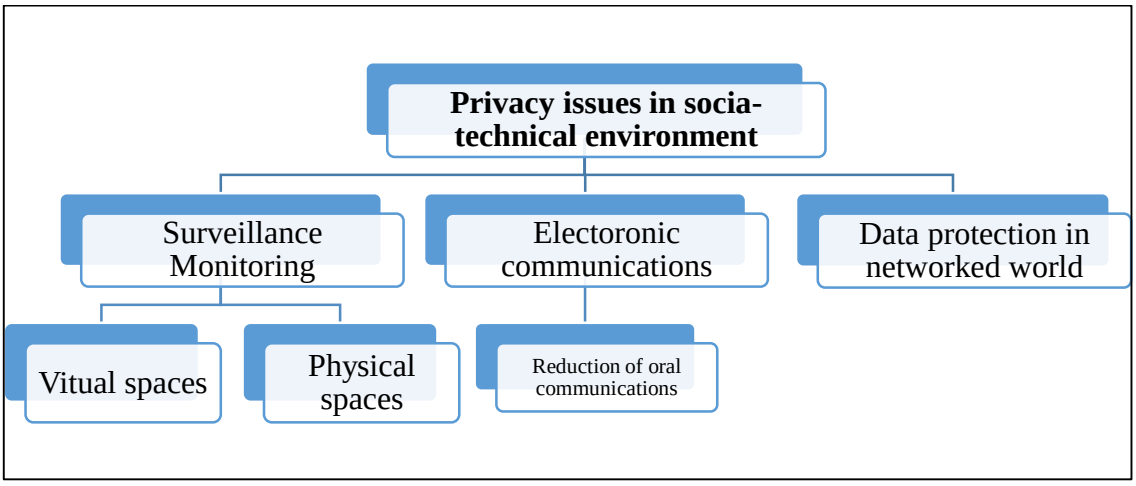


Figure 33: The effect of information age on workers' privacy developed by author

The last impact of technology on workers' life is creation of computer-based document and storage. In the modern workspaces, employees perform their job tasks with devices and electronic systems and store most of significant data in their computers. In this situation data protection and personal privacy in the networked world is converted to the main concerns of employees in work environment. Before arrival of information technology and infrastructures in workplaces, the most familiar ways of regulating

privacy depended on features of built environment , such as the inaudibility of conversation (acoustical privacy) and inability to see through partitions and closed doors (visual privacy). In addition, workers used behavioral norms such as eye contact, physical touch, and maintenance of interpersonal space to manage privacy in their workspaces. While in the information age through the generation of virtual spaces workers still use these mechanisms for maintaining privacy, the importance of them is reduced. Accordingly, creating the high level of privacy in the virtual settings and computer devices are the main concerns of researchers in recent decades (Palen & Dourish, 2003).

In this aspect, Palen and Dourish (2003) claimed that Altman's privacy theory is foundational but has limitations through regulating privacy in the networked world. Altman was concerned with the privacy management in different form of individuals' interaction in spatial environment while in the information age people act in different ways across using new technology devices. In virtual settings generated by information technologies, individuals do not belong to physical spaces the same as past. They exist in the spaces that the concept of interpersonal distance, personal space, personalization, and territory is removed. The people identity is defined based on representation of the information they contribute implicitly and explicitly in networked word. Therefore, for maintenance of identity, people are concerned about the privacy of their information and regulate the enclosure of their personal information in networked word. To solve data protection problems in networked word people are able to control their boundaries between self and others by choosing specific items in most of social networks (Palen & Dourish, 2003).

While all theories and concepts, which are discussed in literature survey of present study, had great participation in order to enhance privacy level in organizations, few of them

analyzed privacy among new generation of workers who are more attached to the technologies. The changes that technologies brought to the work environments in all aspects can change workers' perception about privacy regulation mechanisms, which need extensive investigations. Accordingly, in the next part of this thesis, the young staffs of Eastern Mediterranean University in North Cyprus will be evaluated in order to find their perception about environmental privacy regulators.

5.4 Evaluation of Environmental Privacy Regulators in Different Office Layouts

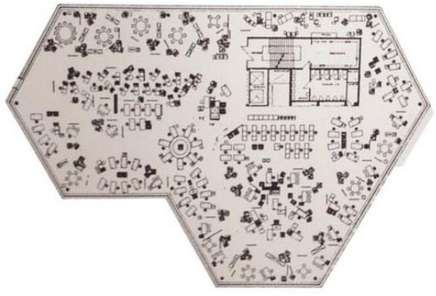
The development of office layout during the history is discussed in chapter 2 in detail. As it was mention in related chapter, the office layouts has been changed in time. Accordingly, the environmental factors, which were used in different periods, were completely different while the job patterns and workers behaviors were changed. These office layouts and the environmental privacy regulators that are used in these layouts are summarized in the following table. Moreover, the level of privacy through using different kind of environmental elements is discussed in this table.

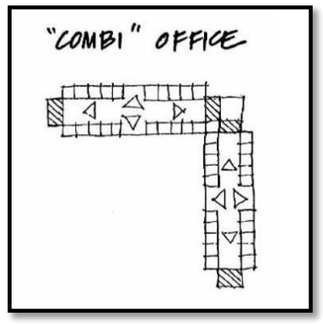
The table also discusses about appearance of these layouts in the course of history. Right now, all these layouts exist in our time and designing the appropriate layout should be chosen according to the tasks that would be done in the office.

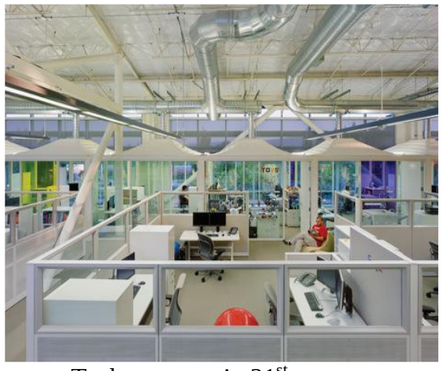
Different job types based on the works' patterns and organizations' purposes need different level of privacy. For example in the bank office the interactions between workers and costumers is the most important vision for managers accordingly the office layout should be in the way that promote this interaction while the workers don not feel crowded or isolated. More open layout seems more appropriate for this kind of jobs. In

contrast, in the job types that workers need concentration for doing the job activities, the high level of privacy should be provide for workers to achieve the desired productivity. Therefore, a closed office might be preferred.

Table 1: Different office layouts and the environmental privacy regulators

Office concept/ Time of emergence/ Specific Features	Sample of layout	Environmental privacy regulators	Discussion
Cellular office or closed-plan office Early 19th Offices with four full height walls and a door which one or a few staffs working there various activities work together in one place	 Closed plan offices	Workers would work in offices with four full height walls and a lockable door. Workers would have explicit boundaries for personalizing the space. The workspace would equipped by sufficient work surface, the other tools would be different across job types. There is no spesific space for group acttivities. The workspace size would not be sufficient for having conversation area.	The layouts have high level of visual privacy and acustical privacy. The level of social privacy would not be in desired level because of limited chance for communicating with othe workers. The layout would be appropriate for workers with complex job types or employees with high job rank, the work tasks that need individual high concentration with little interaction.
"Bullpen" or "Pool" Early 20th Using workers as a production line with direct supervision derived from Taylor's "Scientific management" Principles. Standardization Dehumanization Depersonalization Less Hierarchy	 Larkin Administration Building, 1903	Large number of people work in the open indoor space without any barrier among workers. Workers would not have explicit boundaries for personalizing the space. Workers would allocate closed to each other, accordingly invasion on the territories would exist. Workers would not beable to regulate their interaction with others because of high level of supervision and monitoring. The desk surface would not sufficient for each person. There is no spesific space for group acttivities. The workspace size would not be sufficient for having conversation area.	Lack of barriers among workers create minimum level of vidual privacy and acustical privact for workers. The social privacy is far from the optimum level. Because of the features of layout workers would feel crowded in the spaces. In general the achived level of privacy is far from the desired level. The layout would not be appropriate for any job type.
'burolandschaft' or 'office landscape' Early 1960s Enhancing the flow of communication between members. No closed-office Non-hierarchical by removing physical status symbols Flexibility to accommodate changes	 The Ninoflax building, 1962	Large numbers of workers work in the open indoor space without any barrier among workers. Workers would not have explicit boundaries for personalizing the space. Workers would beable to regulate their interaction with others because of lack of supervision and monitoring. There is spesific space for group acttivities and meetings. The workspace size is not sufficient for having conversation area.	Lack of barriers among workers create minimum level of vidual privacy and acustical privact for workers. The level of social privacy is in desired level because of unlimited chance for communicating with othe workers. In general the achived level of privacy is far from the optimum level. Because of the features of layout workers feel crowded in the spaces. These layouts would be appropiate for job types which need high level of interaction and in situation that all workers are in the same ranks. this layout would not be appropriate for job types with high complexcity because workers would not able to concentrate on job activities

cubicle' or 'panel-based' office Mid 1960s Solving privacy problems of "office landscape" through the "action office systems" manufactured by Herman Miller. The integrated furniture or panels identified employees' workspace range.	 'Cubicle' office layout in 1970s	Large numbers of workers work in an open indoor space. Workers would have explicit boundaries through using the workstations that would separate with panels with height between 1.5 meter and 2 meter without door. Workers would be able to regulate their interaction with others. There is no spesific space for group acttivities and meetings. The workspace size is not sufficient for having conversation area.	Exsistance of barriers among workers create desired level of vidual privacy in these layouts. Acustical privact would not be in optimum level without any constructions sulotions. Social privacy would not be in the optimum level. In general the layout would have privacy problems for workers but the achived level of privacy would not be far from the desired level.
"Combi" office 1970s Communicative space structure through the combination of advantages in open-plan office and closed plan office. Each staffs had own private offices	 "Combi" office layout	Workers would work in offices with four full height walls and a lockable door. Workers would have explicit boundaries for personalizing the space. The workspace would equipped by sufficient work surface, the other tools would be different across job types. To improve interaction in mentioned settings some spaces for project work and meeting would be considered. The workspace size would be sufficient for having conversation area.	The layouts have high level of visual privacy and acustical privacy. The level of social privacy would be in desired level because of unlimited chance for communicating with othe workers. The layout would be appropriate for workers with complex job types or employees with high job rank.
Cubicle office 1980s The popularization of the desktop computerschained workers to their workstations during the office hours. Less workers' communications	 'Cubicle' office layout in 1980s	Large numbers of workers work in an open indoor space. Workers would have explicit boundaries through using the workstations that would separate with panels with height 1.5 meter (workers would be invisible while there are seating and working with their computers) three side cubicle without a door would exist. Workers would be able to regulate their interaction with others if it needs. There is no spesific space for group acttivities and meetings. The workspace size is not sufficient for having conversation area.	Exsistance of barriers among workers create desired level of vidual privacy in these layouts specially in the seating position. Acustical privact would not be in optimum level without any constructions sulotions. Social privacy would not be in the optimum level. In general the layout would have privacy problems for workers and the achived level of privacy would be far from the desired level. The layout would be appropriate for routine, individual, and non-interactive work process where employees sit at simple workstations for doing repetitive tasks during specific time

“hot desking” and “hoteling” 1990s Workers do not have permanent workstations. Whenever they need workspaces, they reserve one workstations.	 Hot desking layout	Large numbers of workers work in an open indoor space. Workers would not have their own territory accordingly; they would not able to personalize their workspace. Workers would have explicit boundaries through using the workstations that would separate with panels with height 1.5 meter (workers would be invisible while there are seating and working with their computers) three side cubicle without a door would exist. Workers would be able to regulate their interaction with others if it needs. There is no spesific space for group acttivities and meetings. The workspace size is not sufficient for having conversation area.	Exsistance of barriers among workers create desired level of vidual privacy in these layouts specially in the seating position. Acustical privact would not be in optimum level without any constructions sulotions. Social privacy would not be in the optimum level. In general the layout would have privacy problems for workers and the achived level of privacy would be far from the desired level.
21st century offices Fewer specialized spaces, maximizes accessibility, and promotes face-to-face interaction.	 Tech conpany in 21st century	Large numbers of workers work in an open indoor space which has also some private spaces. Workers would have their own territory accordingly; they would able to personalize their workspace. Workers would have their own offices with four full height wall and a door. Workers would be able to regulate their interaction with others. There isspesific space for group acttivities and meetings. The workspace size is sufficient for having conversation area. Workers would be able to work in their private offices whenever they need to concentrate on hon activities and also in the other times they can communicate with othe workers in the public spaces of work environmrnt.	The layout would provode optimum level of privacy in all dimensions.

Chapter 6

PILOT STUDY

6.1 Introduction

Based on Kupritz's theory in 2000, which is investigated in the literature survey part, privacy in the workspaces can be optimized by regulating three mechanisms. These mechanisms include environmental mechanisms, behavioral mechanisms and social mechanisms. Among these mechanisms, the environmental mechanisms are the only one that is related to the Architectural field. The environmental mechanisms include the physical elements, which is used in workspaces in order to provide desired level of privacy for workers.

According to Sundstrom (1980, 1982) there is no specific roles for these mechanisms and they should be investigated in different conditions. Generally, the environmental mechanisms positively are linked to the users' expectations. Different variations such as age, gender, job status, job complexity, cultural background, and job type can change workers' expectations about environmental regulators. In addition in the recent decades the office layouts and work patterns changed due the arrival of information technology and its devices. While different studies are done in order to find the appropriate types of environmental regulators from the 1980s, these subjects still should be investigate in information era and among workers who are the users of technological devices in order to see that they are still applicable for 21st century or not.

Accordingly, the present study is totally based on Kupritz conceptual model about privacy regulators, focusing on environmental mechanisms and it is an application of her theory in a specific situation. Accordingly the a pilot study is done in this research to see whether her theory is applicable or not in the first step. Then, to see whether office layouts will affect the workers perception about environmental privacy regulators or not. While it is not possible to test all environmental mechanisms that she states in one case, the research chooses some of them that are more important in the field of architecture and interior design. The chart below are bolded the specific environmental mechanisms that are chosen to investigate.

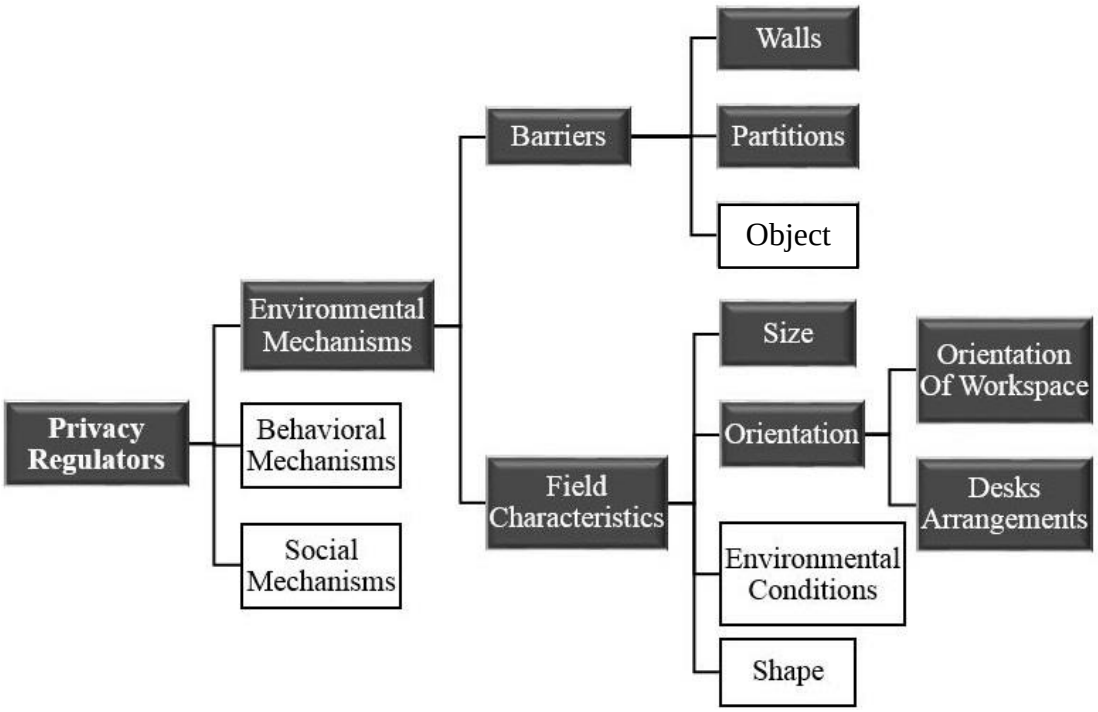


Figure 34: privacy regulators (Kupritz, 2000), subjects in this study are the dark features

In order to achieve the aims of the present study, 26 full-time and part-time assistants of Faculty of Architecture in Eastern Mediterranean University, located in Famagusta, North Cyprus are chosen to study. The characteristics of participants, their work

settings, and the reasons for choosing them are described with more details in the following parts of study.

6.1.1 Characteristics of the Site

The site that participants are working there is located in Eastern Mediterranean University, Faculty of Architecture. In this Faculty, students' classes and studios, conference rooms and library are located in a building with three floors, which is called colored building. The staffs' (instructors and most of the assistants) offices are located in another building. Only one open-plan office layout (occupied by 13 assistants), is placed in the colored building. The picture below shows the bird view of these two buildings.

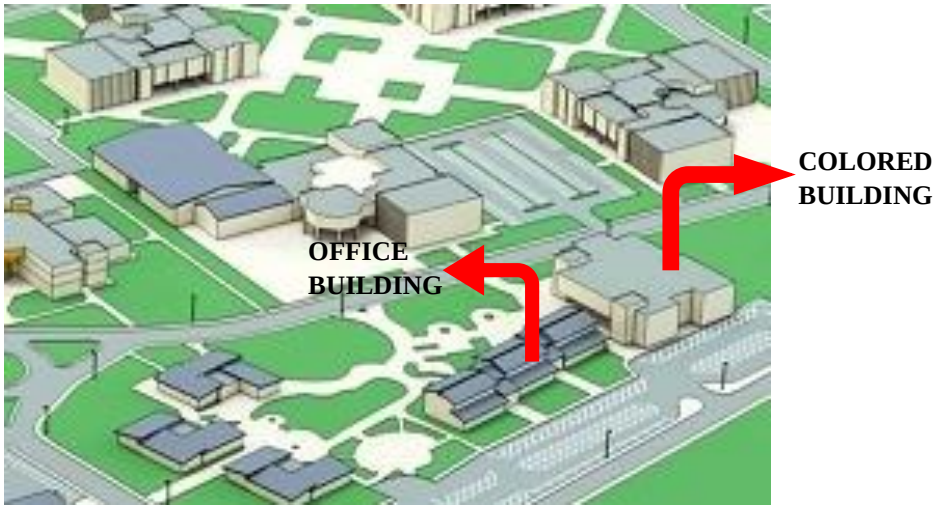


Figure 35: Department of Architecture in Eastern Mediterranean University (http://ww1.emu.edu.tr/tr/) edited by author

Generally, the full-time and part-time assistants in this Faculty are working in two different office layouts, including "open-plan" (OP) and "closed-plan" (CP) offices. There are two open-plan office in this Faculty and totally nineteen persons are working there. From 19 users that are working in these layouts, 13 of them participated in the research. Closed-plan offices are offices that two or three persons are working

together. Totally twenty-one assistants are working in closed-plan offices layouts and 13 of them participated in the research. The positions of these layouts are shown in the figure below (plans are in the same scale).

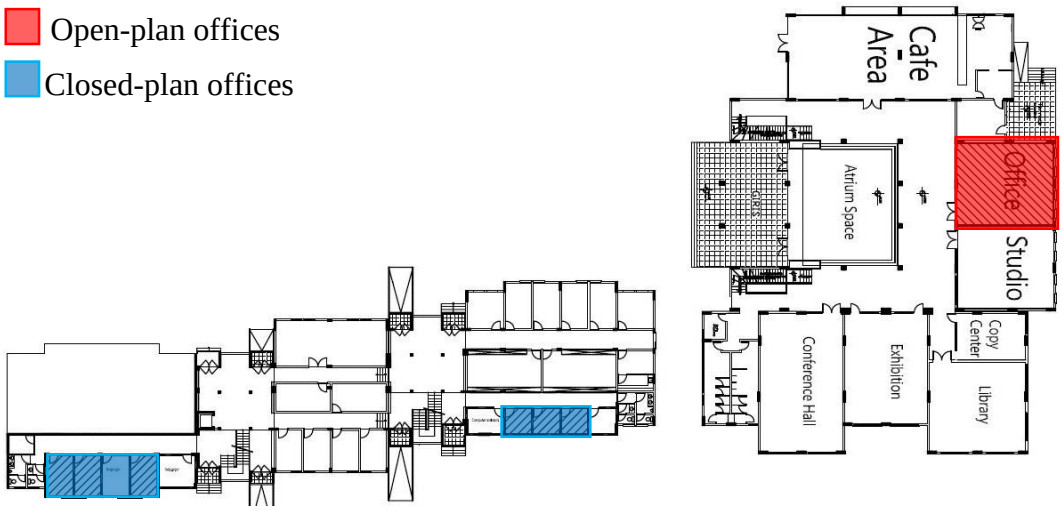
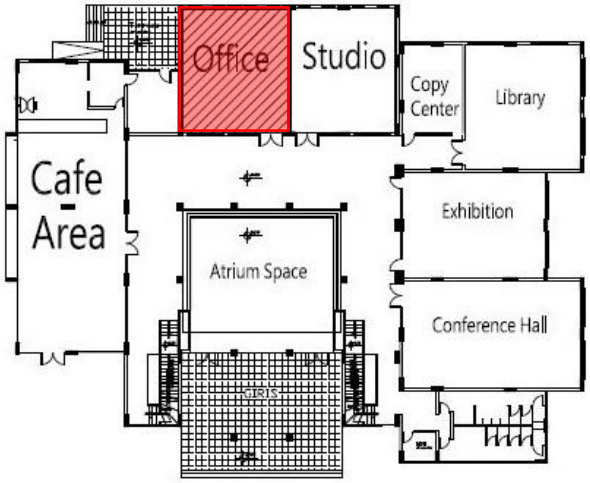
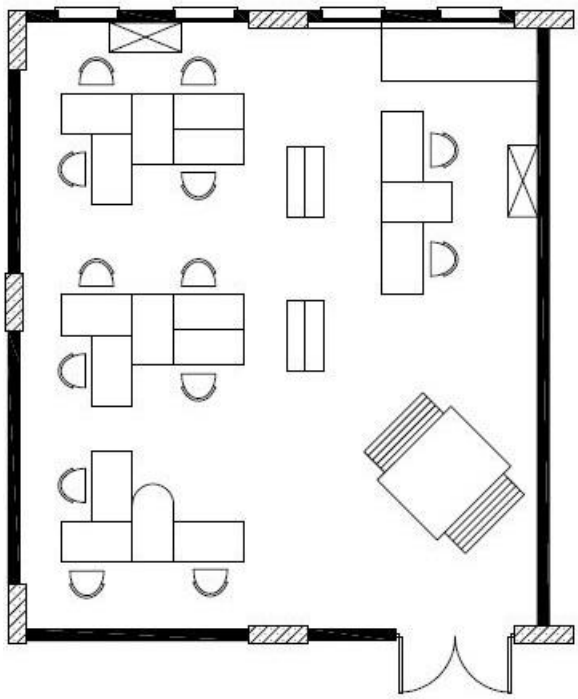


Figure 36: The location of OP and CP layouts in Department of Architecture in Eastern Mediterranean University

The above plan shows the participants' open-plan and closed-plan offices that are located in the ground floor in both buildings of the Faculty of Architecture. Other than there is one more open-plan office in the office building that is located in the third floor and 6 assistants are working there. As the plan shows the OP layouts are located near some public spaces such as atrium, cafe area, staircase etc. However, the CP layouts are in the corridors that are used mostly by staffs. More details about arrangements of desks, workspace size, workers facilities and some pictures related to actual settings of OP an CP layouts are illustrated in tables below. All office plans and layouts in the tables are in the same scales.

Table 2: Description of "OP" layout

<table>
<tr><td rowspan="4">Open-plan office (OP)</td><td>Workspace orientation</td><td>Description</td></tr>
<tr><td> 
</td><td>Number of occupants: 13
<table>
<tr><td>Female</td><td>Male</td></tr>
<tr><td>6</td><td>7</td></tr>
<tr><td>Iranian</td><td>Turkish</td></tr>
<tr><td>5</td><td>8</td></tr>
</table>
Equipment for each workers:
Personal computer
Desk surface
Drawers
Separated meeting table

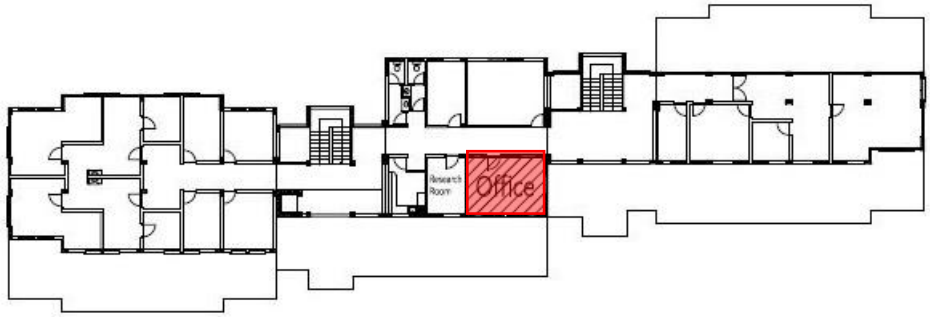
workspace size for each person: 7 m^2</td></tr>
<tr><td colspan="2">Desks arrangement in the workspace and pictures</td></tr>
<tr><td colspan="2"> 

 </td></tr>
</table>

Table 3: Description of "OP" layout

Open-plan office (OP)

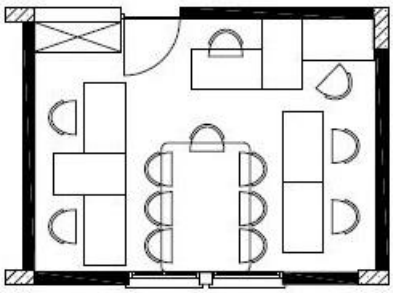
Workspace orientation

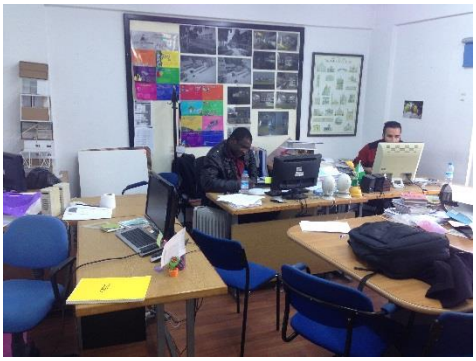


Descriptions

Number of occupants: 6			Equipment for each workers: Personal computer Desk surface Drawers Separated meeting table	workspace size for each person: 3.3 m^2
Female	Male			
2	4			
Iranian	Turkish	Nigerian		
4	1	1		

Desks arrangement in the workspace and pictures





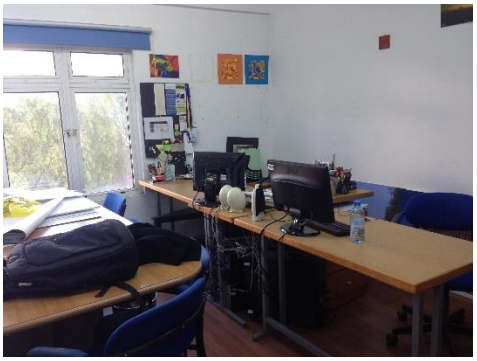
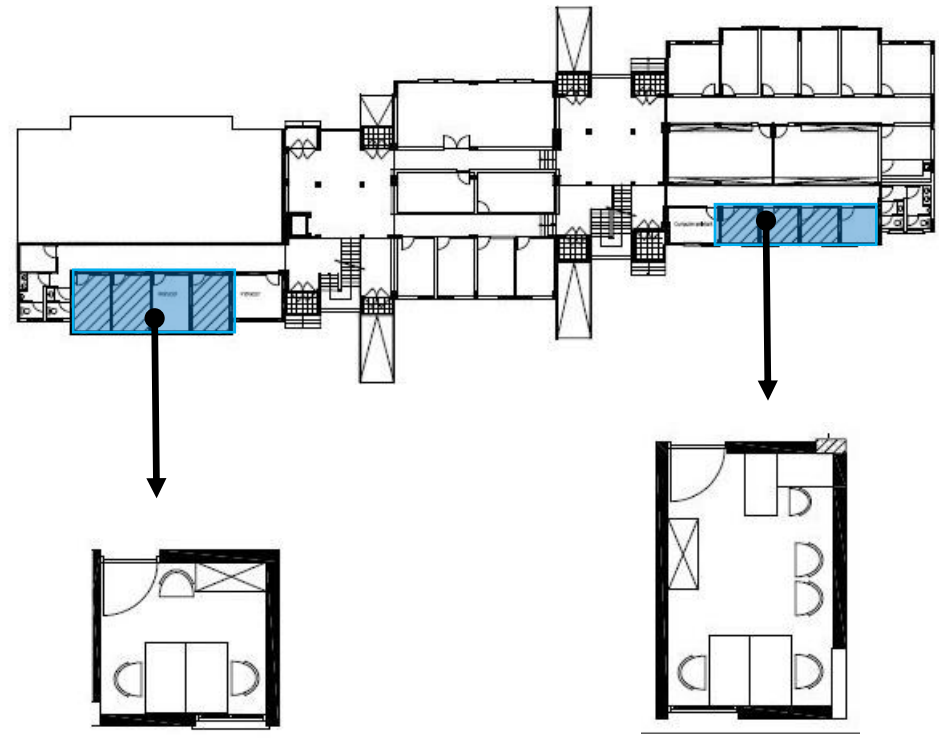


Table 4: Description of "CP" layouts

Closed-plan offices (CP)

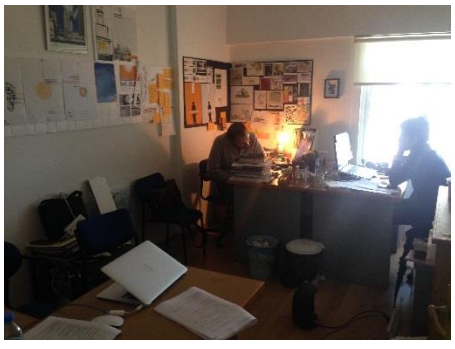
Workspace orientation and layouts



Descriptions

Number of occupants: 21		Equipment for each workers:	workspace size for each person: 4 m^2
Female	Male	Personal computer Desk surface Drawers	
6	7		
Iranian	Turkish		
11	2		

pictures



Regarding plan dimensions, the average workplace size for each worker in open plan offices is almost seven m^2. This amount decreases to four m^2 for workers who work in closed-plan offices. All offices have window view and the lighting and ventilation systems are the same in both office types. There are some white panels in all offices that let workers to personalize their workspaces. While in the CP layouts each assistant has own panel, in the OP offices, each of these panels are shared by four workers. These panels are shown in figure 40.In addition, there are not any barriers such as partitions between coworkers in both office types.

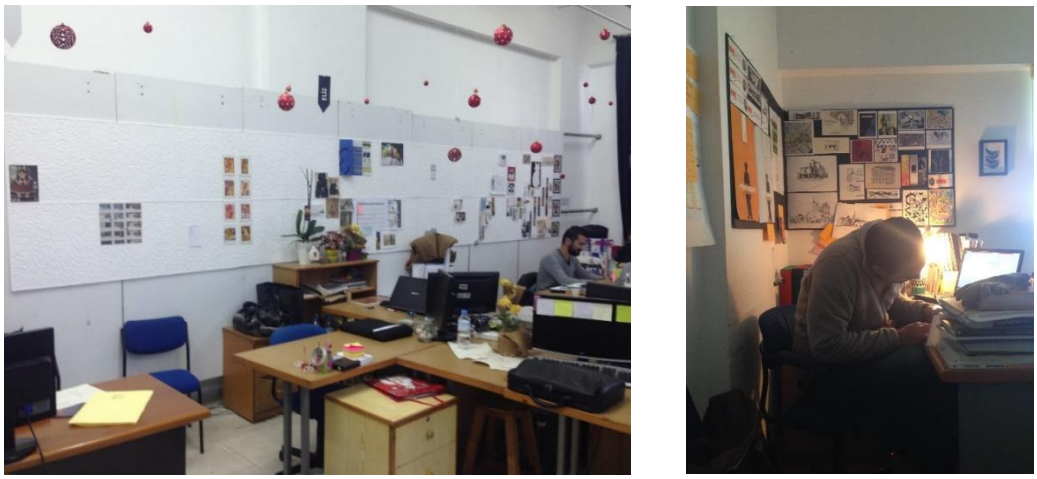


Figure 37: Panels that are used for personalizing workspaces

6.1.2 Characteristics of Participants

While in the theoretical part of present study the pervious investigations on environmental privacy regulators is surveyed and the scholars' suggestions are described, a pilot study also is done in order to test the applicatory of Kupritz theory among new generation of users in work environments. In order to find valuable data, the chosen participants have two main features. Firstly, the cultural background, age range, gender, job type, job complexity, and job status are the same among all participants. In the second step, their job type is specific and is categorized as

knowledge workers. The participants are chosen from the users with the age rang between 23 and 33 as they are more attached to the technological devices and some parts of their job dependent on virtual networkers. Finding the proper case study with mentioned features and acceptable amount of participants was a problem in North Cyprus, Famagusta that corporations had not all these features in the same time.

Eastern Mediterranean University with large number of staffs and students from different countries is recognized as the biggest corporation in the Famagusta, North Cyprus. Accordingly, it was decided to choose participants among staffs of this university. Furthermore, instructors in all faculties were analyzed, but the number of them with the same features was the most important limitation, especially in terms of job status and age range. Then the same evaluation was conducted among assistants of different departments. The assistants in Architectural Faculty in this university were the most appropriate sample with larger number of assistants. Consequently, full-time and part-time assistants in EMU Faculty of Architecture were chosen as the case of this study.

All of the full-time and part time assistants in EMU Faculty of Architecture (except one person) were Iranian and Turkish. Based on Altman (1975) cultural categorization, the cultural background of them are the same. He called this cultural background as Middle Eastern. Their job type is categorized as knowledge workers (desired job type) and their age range is between 23 and 33.

Knowledge workers are those employees who have responsibility for exploring and generating ideas and concepts rather than concentrating only on implementing or managing existing processes or operations within the organization. Software

engineering, doctors, architects, lawyers, and academics are typical examples of knowledge workers(Brinkley, Fauth, Mahdon, & Theodoropoulou, n.d.).Doing department duties, studying courses, giving critics to students, and using computer for researching are the activities, which participants do in their offices. While participants spent more than five hours a day in their workspaces, they are the user of these spaces.

Unfortunately, among 40 full-time and part-time assistants in this department only 26 of them participated in present study. General information about these participants show in below diagrams.

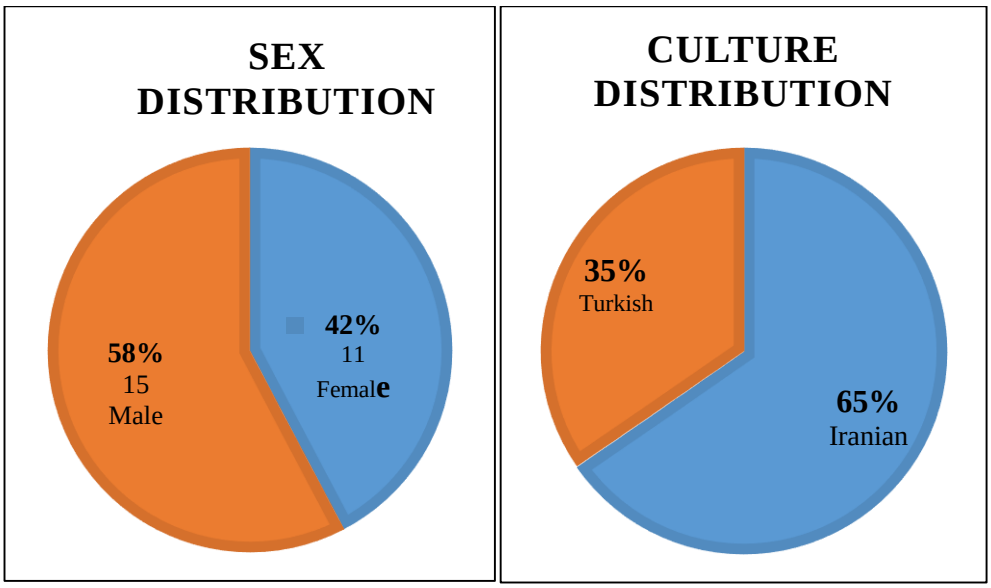


Figure 38: general Information About participants (full-time and part-time assistants in EMU Faculty of Architecture)

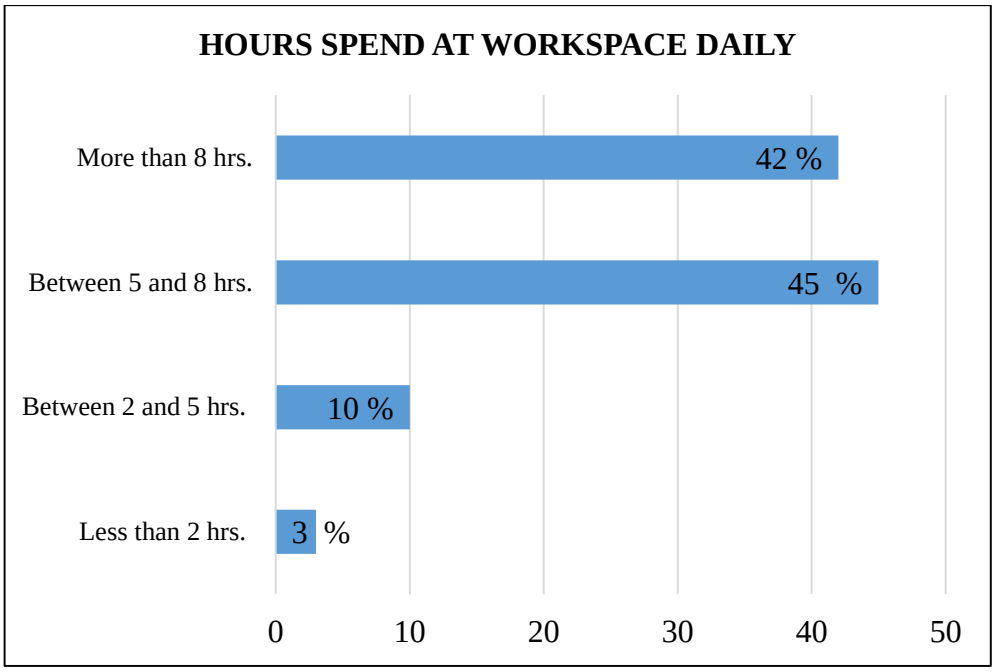


Figure 39: Average time that participants spend in workspace daily

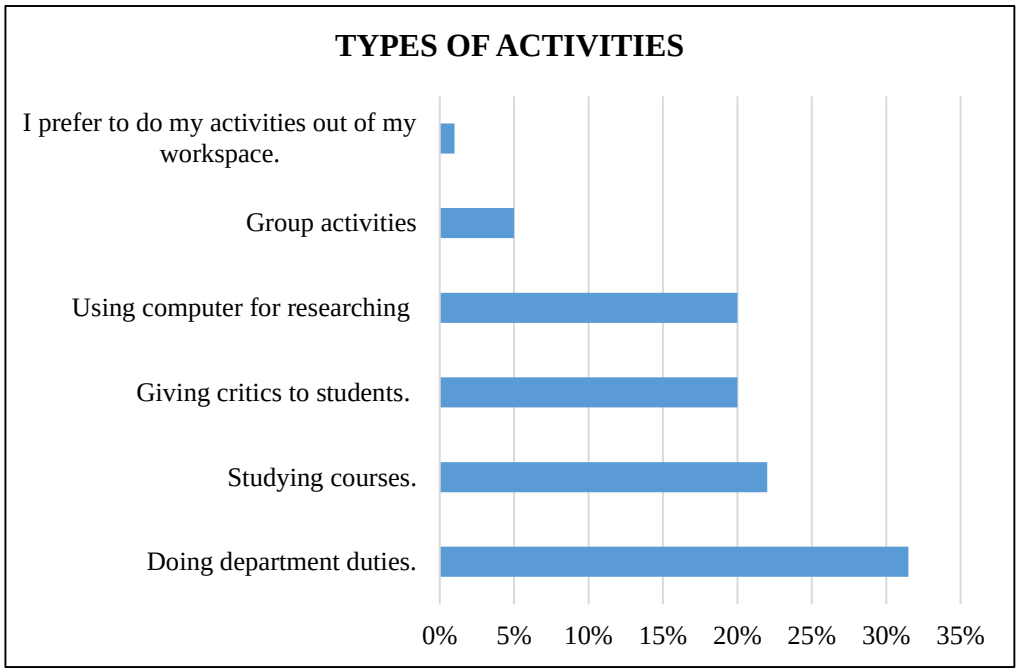


Figure 40: The activities that participants do most of the time in their workspaces

6.2 Methodology of Data Collection

Because the study is based on Kupritz (2000) conceptual model about privacy regulators in the workspaces, author concentrated on the series of studies that she conducted on her theory. She conducted a research among 50 aerospace engineers with the specific ranks within a certain age rang, and gender. The present study is tested the applicatory of her theory among assistants of EMU which are categorized as knowledge workers.

The method that Kupritz (1998) used in her article with the title of "Privacy in the work place: the impact of building design" seemed as the most appropriate methodology for present study because it is a pilot study.

The method of mentioned article is Heuristic Elicitation Methodology (HEM) that has two phases including Domain definition and Belief Matrix. In the first phase, open-ended interview should be done with some of the participants to find the major answers related to research topic. Previous experience suggests that a large sample is not necessary for the first phase of the HEM. This kind of intensive interviewing is designed to discover the range of knowledge and attitudes of respondents about a particular domain. The interviews reveal the range of items and attributes of a well-defined domain relatively quickly (Nardi & Harding, 1978 cited in Kupritz 1998).

The Domain Definition identifies domains through semantic relationships in terms of behavior, artifacts, and knowledge that people have learned or created. The domain is a set of categories organized based on a single semantic relationship (e.g., 'X' is a kind of 'Y'). The set of questions that Kupritz used for Domain Definition step is presented below:

- What are the different kinds of things that you do, or try to do, or try to get done in your office? [Answers='X']
- For/when 'X', what conditions, or office features, or situations make it easier to conduct that activity? [Answers='Y']

  PROBE: What else might make it easier to conduct 'X' other than 'Y'?
- What conditions, office features, or situations make it Harder to do 'X'?
- What kinds of things are important for you to be able to have in your personal work area? [Answers='X']

  PROBE: When, at what times, or in what situation having 'X' important to you? [Answers='Y']

  PROBE: When else, other than 'Y', would 'X' be important for you to have in your personal work area? (Kupritz, 1998)

The second step of HEM methodology is to design a structured questionnaire consisting of a Beliefs Matrix and Preference Ranking based on interviews' results. The Beliefs Matrix that Kupritz designed in her article is shown in figure 41 as a sample of this step.

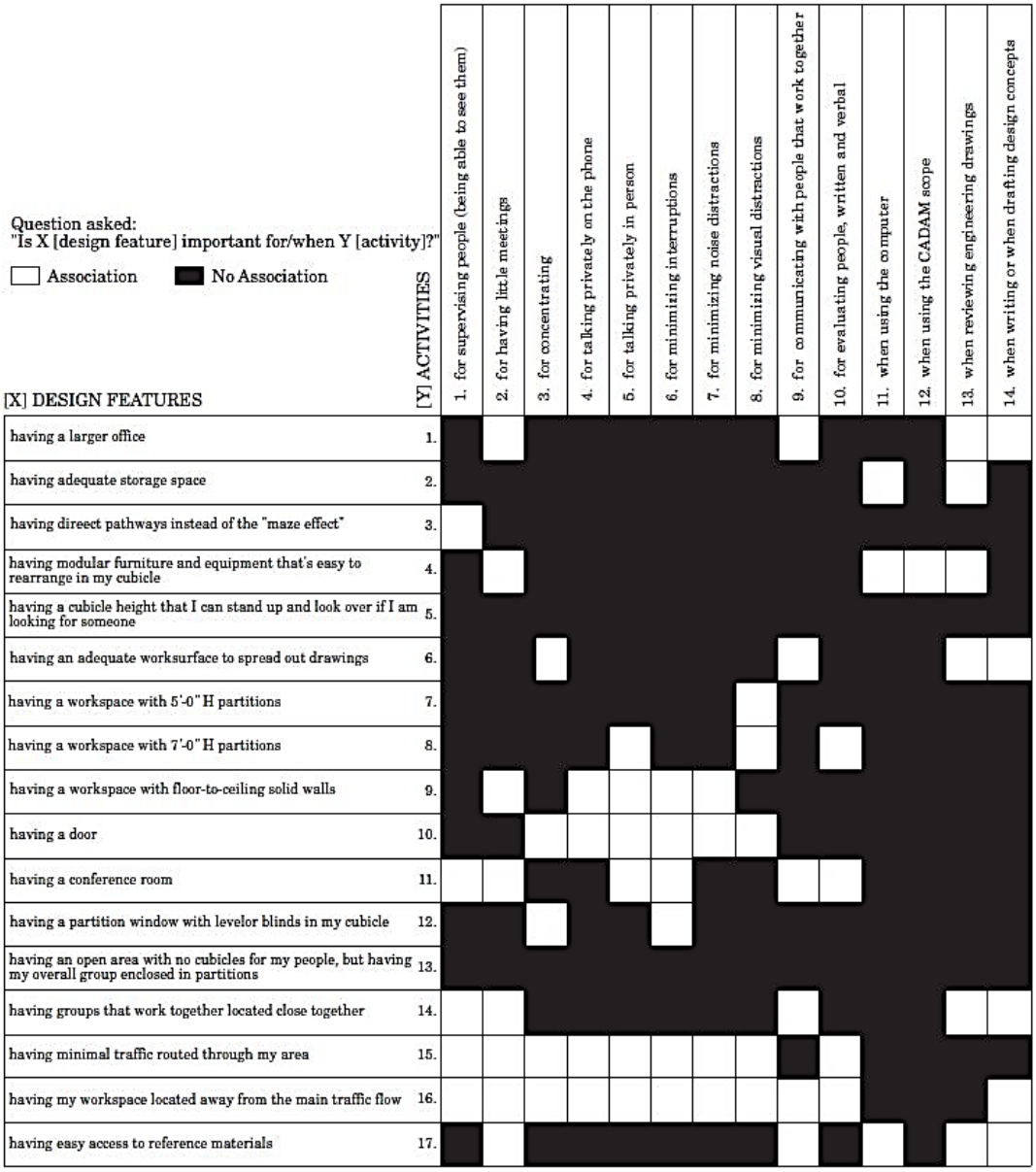


Figure 41: Beliefs Matrix questionnaire, used in Kupritz article (Kupritz, 1998)

While the limited amount of participants impended using this method for present study, the open-ended questions that Kupritz used for interviewing, were the foundation of questions of this study.

6.2.1 Steps of Data Collection

As it was mentioned in previous part of study, the questions that Kupritz used in her open-ended interviews are the foundation of the questions in the present study. Author developed and adapted Kupritz questions and prepared different questions that are attached in the appendix part of the study. The open-ended interview comprised some general questions about the major activities that assistants do in their workspaces, the time that they spent there, the facilities that they need, the main factors that disturb their concentration and so forth.

According to the results of this step, a closed-ended questionnaire was prepared. Except one worker that was Nigerian, the questionnaires were distributed among all full-time and part-time assistants in the Faculty of Architecture. From forty participants 26 of them filled the questionnaires, which 13 of them work in OP office layouts and 13 of them work in CP office layouts.

The final questionnaire of present study is comprised of two main parts. The questions in the first part start with some general information related to the users which include:

- Their gender, age range, nationality
- Average hours that they spend in their office daily
- The major activities that they do in their workspaces
- The type of relation that they have with their office-mates

In this part of questionnaire, the first question has agree/disagree format. This question is about feeling of users about the level of privacy in their workspace related to the existing environmental features in their workspaces. The second question is about the factors that disturb users when they are working in their offices. The aim of these

questions was to identify perceptions of participants about actual level of privacy in their workspaces and to find the environmental factors that have negative impact on the level of privacy. The results of these questions are used for evaluating questions in part two.

In the second part of the questionnaire, series of questions are asked from assistants in order to evaluate their expectations about the appropriate type of environmental privacy regulators that they need to achieve desired level of privacy. The focus of these questions was on the proper type of barriers, desk arrangement, and workspace size. Questions of this part have different formats, which is explained below.

In order to find appropriate type of barrier among co-workers, firstly the importance of barrier among workers is asked. Then the question separated into two sections: when the answer is "YES" and when the answer is "NO". Based on the literature survey different items were selected for each answers. The participants who choose "YES" should select one of the following item:

- The workplace completely closed with walls and a door.
- The workplace with 2 meter height partitions (no one can see you while you are standing)
- The workplace with 1.5 meter height partitions (no one can see you while you are seating)

The mentioned heights for partitions are based on Daroff and Rappoport (1992) and Vischer (1989) recommendations.

In addition, the participants who choose “NO” should select one of the following items:

- The existence of walls and partitions are not important while my personal computer’s information is invisible
- The existence of walls and partitions are not important while the desk arrangement and co-worker distance be appropriate.
- The existence of walls and partitions are not important while my personal tools are secured.

The same question also is designed in order to understand the appropriate type of barriers among workers and strangers.

The question related to workspace size is an ordinary question with some items that participants should choose one of them.

Based on Kupritz conceptual model, orientation of desks (desks arrangements) in the work environment is another environmental factor that should be investigated in order to understand privacy level in workspaces. Moreover, Sundstrom (1980), Steele (1995), and kupritz (1998) state that closed-plan offices with four full height walls and a door is the workspace with high level of privacy. Accordingly, participants were asked to draw their ideal desk arrangement in the hypothetical closed-plan office in order to find their perceptions about appropriate orientation of desk when they are alone in office and when they have one office-mate. Details of questionnaire are available in the appendix part of research.

In sum, the purpose of designed questionnaire was to find actual level of privacy in workspaces that participants work and to discover the environmental privacy regulators they need to achieve desired level of privacy. In addition, as it was mentioned before, the full-time and part-time assistants in described faculty are working in two different office layouts include open-plan (OP) and close-plan (CP) layouts. Filled questionnaires were separated in two parts in time of evaluating dat. The reason of separation was to find whether participants in different layouts have the same expectations about mentioned environmental privacy regulators or not.

6.3 Data Analysis

Generally, the questionnaires were evaluated bay SPSS software, author observation, and analyzing the documents of layouts. Together with filling questionnaires, direct observation was done to identify physical features of workspaces that might be related to privacy issues. In addition, office layouts were photographed and the documents of layouts were analyzed to investigate the design features of office layouts. This information helped to familiarize author with facility information in preparation for data analysis.

As it was described, questionnaire had two main parts. In the first part, the issues of participants for achieving desired level of privacy in their actual setting are evaluated. Finding the environmental privacy regulators that users expected to have in an ideal office layout are the focus of questions in second part. In addition, the filled questionnaires were separated into two parts in order to find the impact of office layout on workers perceptions and expectations. These two parts evaluated separately. The results are described in the following parts.

According to literature survey, job interruption factors are directly linked with workers privacy level in their workspaces (Hedge, 1982). The results of environmental factors

that disturb participants in OP layouts and CP layouts are shown in figure 42 in order to find privacy problems in their actual settings. Based on the chart, the most important factor that disturbs assistants' concentration in OP layouts is co-workers' conversations or noises in indoor space of offices. Moreover, outdoor noises and presence of strangers in offices are other significant factors that workers mentioned as their problems in these office layouts.

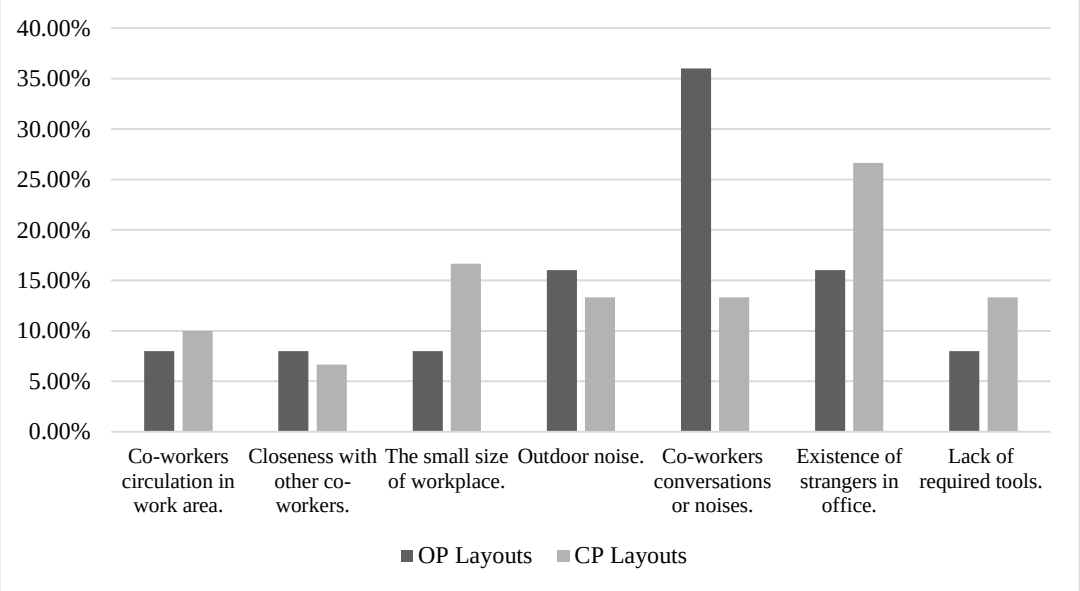


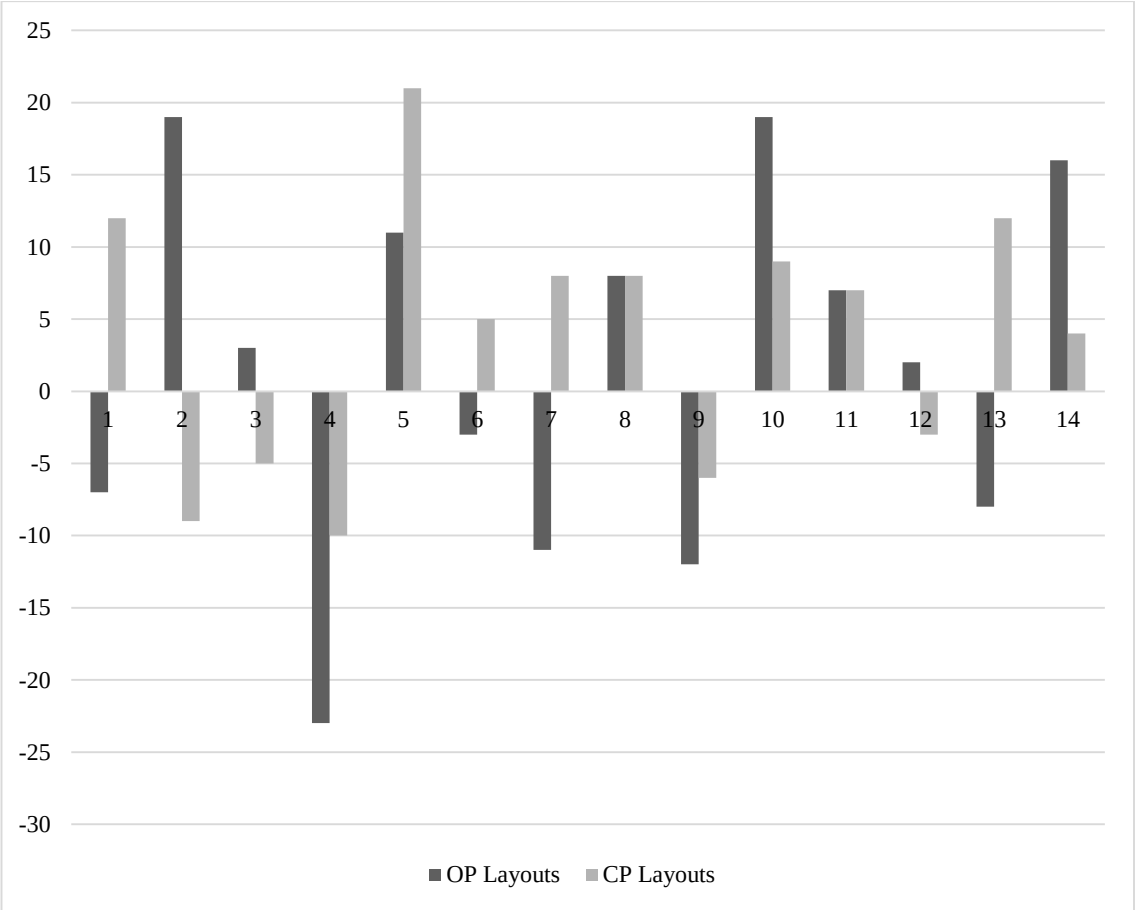
Figure 42: Factors disturbing workers' concentration in their workspaces

Closeness with public spaces such as café area and staircases could be the reason of outdoor noises and large number of users in one space without any barriers could be the reason that indoor noises disturb users in OP layouts. These outcomes proved that the orientations of OP layouts are not appropriate for concentrating on job activities because of lack of acoustical privacy.

While it seems that lack of acoustical privacy is the major privacy problem for workers in OP layouts, the results for CP layouts are completely different. In these layouts, existence of strangers is the main factor that disturbs workers' concentration. Based

on author observation, the small size of workspaces and lack of conversation areas in these layouts are the reasons that make existence of strangers as a problem for concentrating on job activities in CP layouts. The other reason might be related to invasion of strangers on users' territory because of small size of the workspaces.

Figure 43 is also related to workers' privacy problems related the design features such as workspace's barriers, desks arrangements, and co-workers' distance. The figure also includes types of users' communication and evaluates the level of users' privacy through asking their feeling about crowding and isolation.



1	explicit boundary	8	having confidential conversations
2	feeling crowded	9	security of personal tools
3	Adequate work surface	10	having face-to-face interaction more than electronic communications
4	feeling isolated	11	Appropriate desks arrangement
5	reliable office-mate(s)	12	Inappropriate co-workers' distance
6	appropriate facilities	13	having sufficient privacy
7	suitable place for concentrating on job	14	communicate with people that work together

Figure 43: Assistants' Privacy issues in researched office layouts

The question of this part of questionnaire had agree/disagree response format. In order to evaluate the answers of participants, a value between 2 and -2 is assigned to "strongly agree" to "strongly disagree" phrases. Hence, when the total summation is positive, it shows that most of the participants agreed with the issues and is vice versa when the total summation is negative. Zero is the result of equality of positive and negative answers.

While workers in both office layouts have privacy problems, workers in CP layouts perceived more privacy in their workspace (analyzed based on factor number 13). Accordingly, the CP layouts are more proper than OP layouts in terms of concentration on job activities as participants' answers also supported this fact. Despite the fact that in both office layouts results are near to each other about the workers' distance, office facilities, desks arrangements, and amount of work surface, the reason of this differentiation in level of privacy is existence of explicit boundary and having more acoustical privacy in CP layouts. Based on author observation, whereas participants in OP layouts have their own workspaces, lack of explicit boundaries and conversation areas in these layouts let other workers or strangers to use empty work surface. In addition, the CP layouts are located in the corridors away from public spaces. These spaces are quieter than OP layouts' settings.

The other point is related to workers' communication in their office layouts. Although, lack of boundaries between workers in OP layouts has decreased the privacy level, it has enhanced the amount of face-to-face communications among workers (analyzed based on factor 14). Consequently, users in OP layouts have more informal relations and less concerns about security of their personal tools (factor 9) than participants in CP layouts.

While based on literature review, author expected that, the arrival of information technology has influenced on workers' types of communications, the results of this research found out distinguished answers. The outcomes proved that EMU assistants in Faculty of Architecture prefer face-to-face communication to electronic communications (analyzed based on factor 10). Moreover, OP layouts are more suitable spaces for workers communications than CP layouts. As the results show,

users in OP layouts have more communications with each other than users in CP layouts.

According to theoretical part of present study, feeling isolated and crowding are two indicators that show invasion of privacy from its optimum level. While, based on analyzing factors 2 and 4, participants in CP layouts feel more isolated in comparison with participants in OP layouts; still most of participants in CP layouts were “disagree” about feeling isolation in their office layouts. The opinions of most of them about feeling crowded also were negative (factor 2).This evaluation shows that the privacy in CP layouts is near to the optimum level. In addition, large numbers of participants in OP layouts were “strongly agree” about feeling crowded in their workspaces. This evaluation shows that privacy level in OP layouts have large deviation from its optimum level.

As it was mentioned in the literature, feeling crowded is created when the actual amount of privacy is less than desired level of privacy. The results of figure 43 also show that the desired level of privacy and actual level of privacy are far from each other in OP layouts. Accordingly, workers in these layouts feel crowded strongly. The gap between actual level of privacy and desired level of privacy for participants who work in CP layouts is insignificant. Consequently, most of the participants in these layouts do not have the feeling isolation and crowding.

After analyzing the level of privacy and the privacy problems that participants had in their actual settings, the second part of questions are related to the users’ expectation about ideal form of barriers, desk arrangements, and workspace size. The results of the second part of questionnaire have been compared with results of first part of

questionnaire in order to find whether the office layout has affected the participants' perceptions or not.

The importance of barriers between co-workers is asked from participants as the first question of this part. The results show that 61.3% of participants who work in OP layouts and 77% of participants who work in CP layouts preferred to have barriers with their co-workers in their ideal workspace.

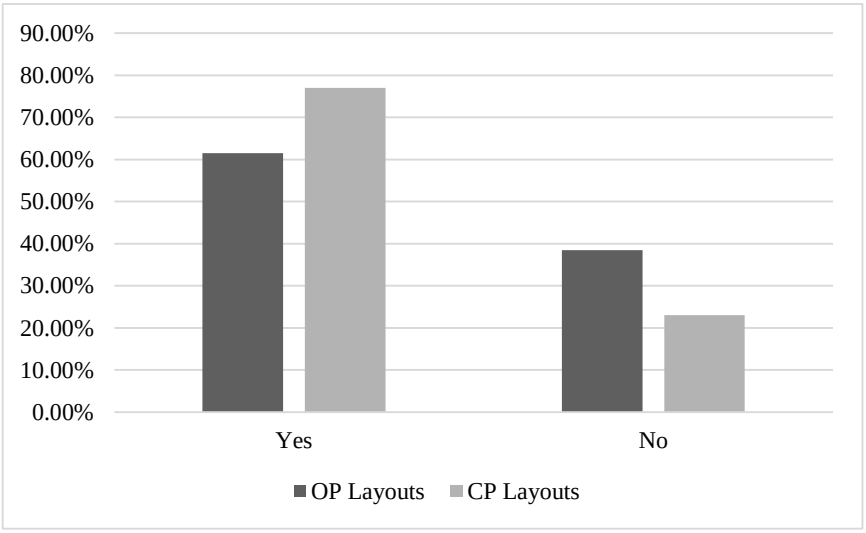


Figure 44: Workers' perceptions about importance of barriers between workers

While in both office types, workers agreed with existence of barriers among co-workers, there is a disagreement between those who experienced working in open-plan layouts. Forty percent of participants who are working in OP layouts believed that the existence of walls and partitions are not important factors in their ideal office layouts. 80% of these users also mentioned that if the desk arrangement and the distance among co-workers are appropriate they would not need any barriers among themselves and other co-workers. The reason might be related to their experience about working in a layout without any barriers. Only 23% of users in CP layouts approved that the ideal office form of workspace can be without barriers. They also believed that that if the

desk arrangement and the distance among co-workers are appropriate they would not need any barriers among themselves and other co-workers. It is obvious that when all factors are the same among all participants these variations in answers can be the impact of office layout differentiation (analyzed based on figure 45 and 46).

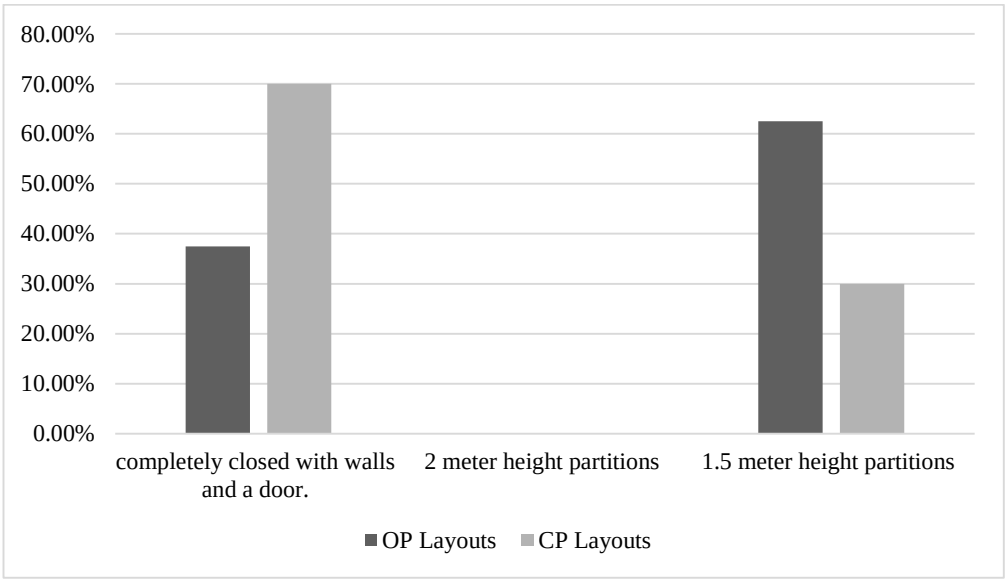


Figure 45: Perception of workers about ideal form of barriers between workers

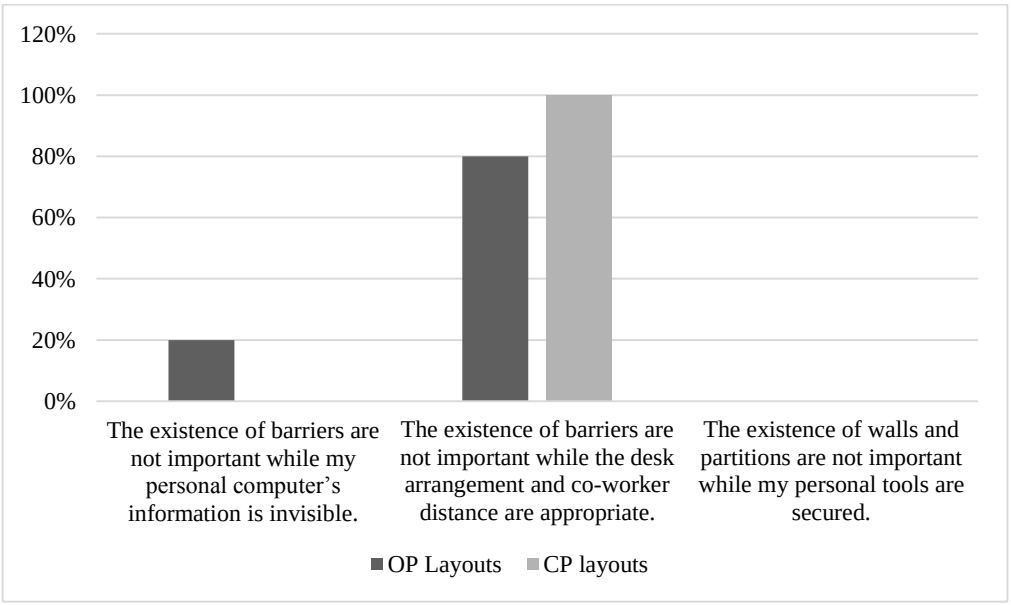


Figure 46: Workers' reason about unimportance of barriers between workers in office layouts

In addition, among participants in OP layouts who agreed with barriers in office layout, 62.5 % chose partitions with height of 1.5 meter as the ideal form of barriers. It seems that they thought that partitions with 1.5 meter height are the solution of their actual setting problems for obtaining optimum level of privacy. However, the workers who are working in CP layouts had have different ideas about ideal form of barriers in office. Most of them (70% of participants) in these types of layouts believed that the appropriate type is the workplace completely closed with walls and a door. The reason might be that they feel to have optimum level of privacy in their actual settings and they do not need any changes in terms of barriers in their ideal layouts.

The same question is asked to find the appropriate form of barriers between workers and strangers. The results were close to each other in both types of offices. 70% of workers in CP layouts and 92.30% of workers in OP layouts agreed that the barrier between coworkers and strangers is important. Most of participants in both groups (58.34% of OP participants and 70% of CP participants) chose walls and a door as the ideal form of barrier between workers and strangers. It is interesting to see that the other 40% of those who work in OP layouts believed that having a 1.5 meter height partition is the appropriate type of barrier between them and strangers in order to obtain optimum level of privacy.

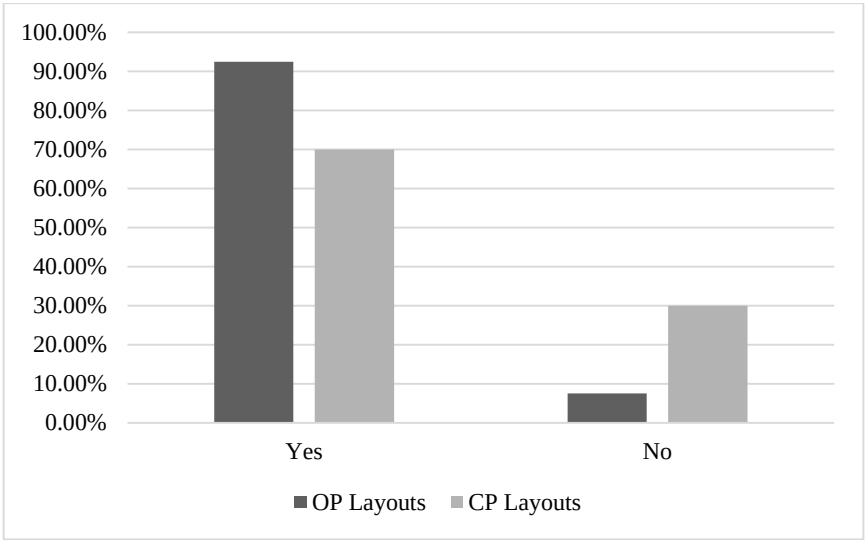


Figure 47: Workers' perceptions about importance of barriers between co-workers and strangers

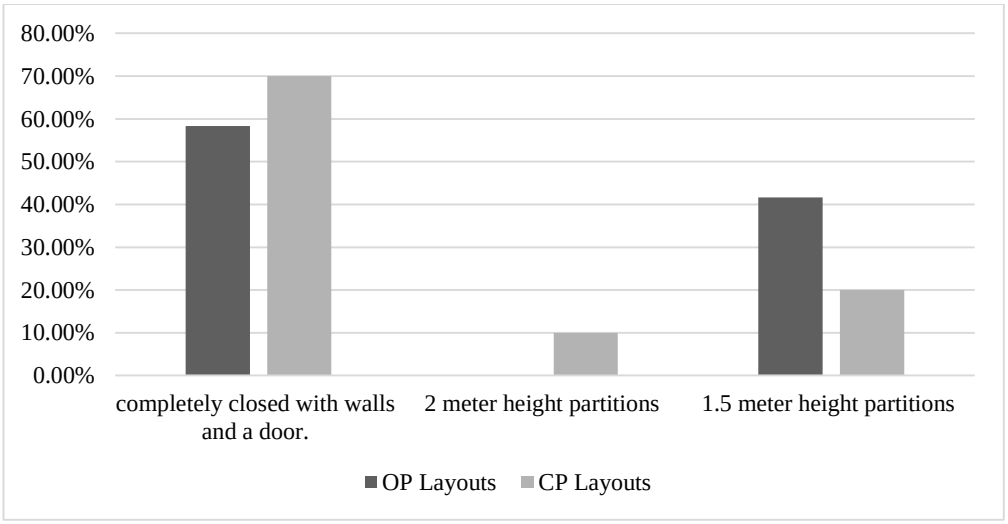


Figure 48: Perception of workers about ideal form of barriers between workers and strangers

The other factor that is investigated in present study is the optimum size of workspace for participants. Based on filled questionnaires, the workers in different office layouts have had different ideas about optimum size of their workspace. 54% of workers in OP layouts believed that the appropriate office layout should have sufficient desk surface with drawers and a conversation area with one person. Based on author observation and layouts' analysis of OP spaces, users do not have conversation area

even with one person in these layouts. In addition, their office layouts have a specific space for doing group activities. It could be a reason that they perceived a conversation area with one person as the ideal form of workspace size while lack of this space exists in their actual work settings.

However, the answers to this question are different for the participants who are working in CP layouts. Fifty-four percent of workers in CP layouts chose the sufficient desk surface with drawers and a separated meeting space for doing group activities as an ideal workspace size. The reason might be related to satisfaction of workers about privacy level in their offices. As it was mentioned before, the actual level of privacy and the desired level of privacy are close to each other these offices. Moreover, their office layouts do not have enough potential for group activities. Lack of this facility in CP layouts also makes them feel more isolated in comparison with participants in OP layouts. Accordingly, workers in these offices perceived having the same office layout with separated meeting space as an ideal form of workspace size.

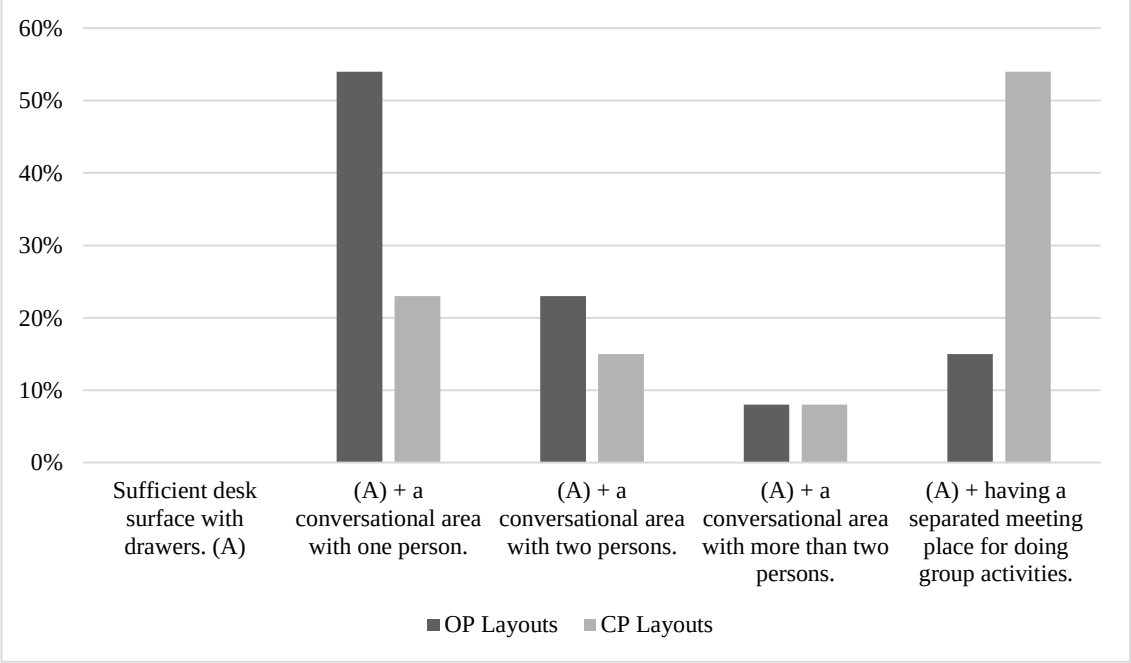


Figure 49: Workers' perceptions about Optimum workspace size

Based on Kupritz conceptual model, orientation of desks in the work environment is another environmental factor that should be investigated in work environments. Moreover, Sundstrom (1980), Steele (1995), and kupritz (1998) state that closed-plan offices with four full height walls and a door is the workspace with high level of privacy. This fact is considered for designing the question that is related to arrangement of desk. It means the data would be more valuable if the participants arrange the desk in the space that have maximum level of visual and acoustical privacy because the other factors do not have affect their answers. Accordingly, in order to find workers' perception about appropriate orientation of desks is asked from participants to draw their ideal desk arrangement in a hypothetical closed-plan office. In figure 50 the following some samples of participants' drawing are illustrated. The results of these drawings are shown in tables 5 and 6.

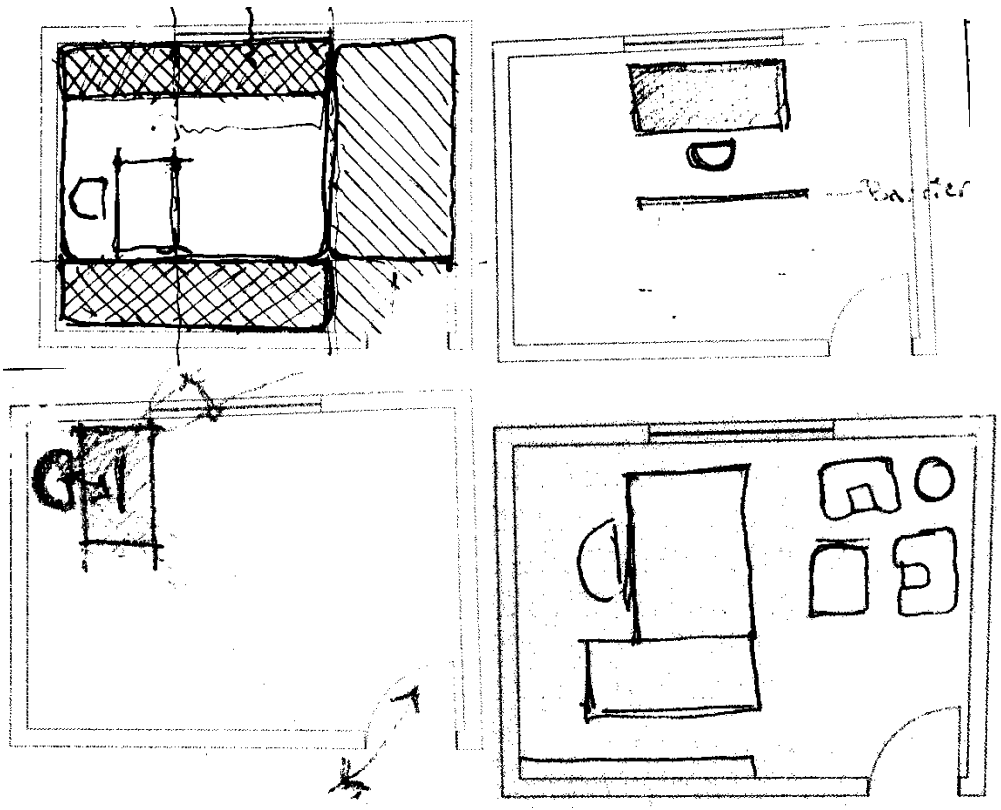


Figure 50: some samples of participants' drawings about ideal desk arrangement

Table 5: The perception of participants working in OP layout about ideal desk arrangement

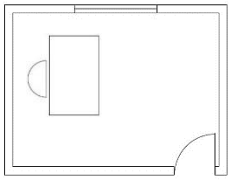
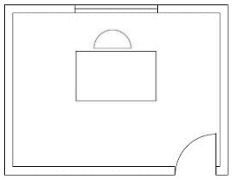
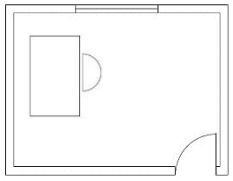
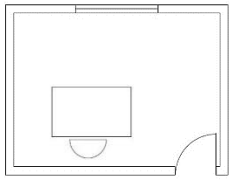
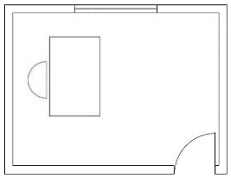
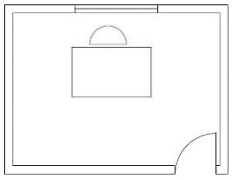
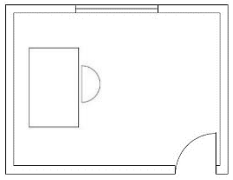
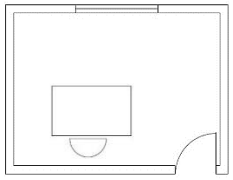
			
69.23 %	15.38%	7.69%	7.69%

Table 6: The perception of participants working in CP layout about ideal desk arrangement

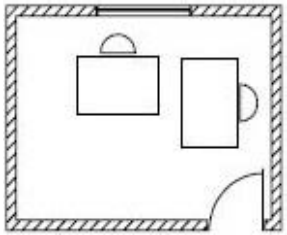
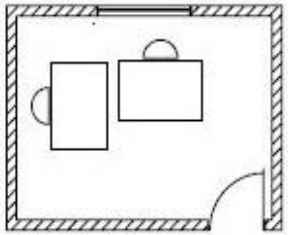
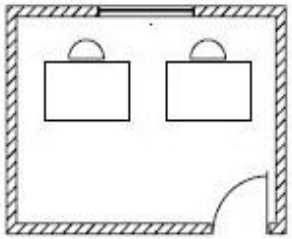
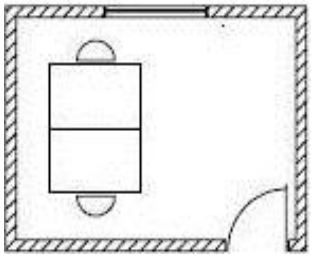
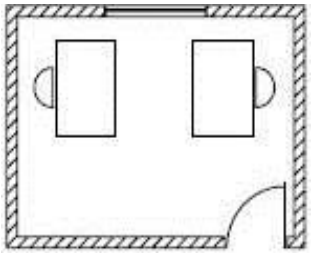
			
61.53%	23.07%	7.69%	7.69%

The results of participants' drawings are close to each other in both office layouts. Generally, 64% of all participants drew their desk perpendicular to door and window. Having window view and view of entrance were the main reasons of participants for this desk arrangement. Moreover, some users mentioned that they feel maximum amount of privacy in this desk arrangement. Having more conversation area was another aim of them. This result also supported Robson's study in 2008 that found maximum amount of privacy in corners of spaces.

Moreover, the result supported the research of Wang and Boubekri (2011) about workers' seating preferences in a specific closed office layout. The zone that 85% of workers' chose for their desk arrangement in this study is located in the favorable zone that participants in Wang and Boubekri had chosen.

The last results are related to users' perception about the ideal desk arrangement in a closed office that two persons use it. In this question some sample of desks arrangement are suggested to participants and are asked to choose one of them. The question also had one empty space for participants' drawings if their ideal arrangement was not existed in suggested items. The results of this question were also the same for participants in both groups. 76% of participants who work in OP layouts and 69% of participants who work in CP layouts chose their desks perpendicular to door and window. Having maximum distance between co-workers and having window view were the main aims of this arrangement. The results for this question are shown in table number 7.

Table 7: Workers' seating preference in a hypothetical closed plan office

					
workers in CP layouts	76.92%	7.69%	7.69%	7.69%	0%
workers in OP layouts	69.23%	15.38%	7.69%	0%	0%

6.4 Evaluation of Findings

The finding of this study is near to findings of Kupritz's study, whichwas conducted in 1998 among aerospace engineers. Kupritz (1998) found that partitions with 1.5 meter and 2.1 meter height, as the most important physical elements that aerospace engineers needed for obtaining optimum level of privacy in their workspaces. Having a separated meeting room for doing group activities and a partition with mini-blinds window were other preferences of them. She mentions that while preparing private offices with solid walls and a door is greatest pattern for visual and acoustical privacy, in some situations using partitions can provide sufficient privacy for workers (Kupritz, 1998). Except the types of barriers and the workspace size, the present study also tested the appropriate desk arrangement. Moreover, Kupritz (1998) did her investigation among workers who all of them work in open-plan layout (one type of layout) but the present study analyzed these environmental regulators in two types of layouts.

According to the results of this study, different office layouts with different orientations in the work environment made different privacy problems for workers. The results also proved that workers in the same age group, job type, job complexity, job status, and cultural background have different perceptions about environmental privacy regulators in various office layouts. Among the environmental regulators that are investigated in the present study, participants' perceptions were completely different about the appropriate type of barriers and the workspace size.

For participants in OP layouts, lack of barriers among workers and other workers' conversations are the main privacy problems consequently they perceive a workspace with partitions with height of 1.5 meter as an ideal form of barriers among workers. In

the real situation, these workers are working in open-plan layouts without any partitions among workers. The results also proved that these workers are satisfied with the working in open-plan layouts because of having high level of communication and the existence of meeting area. Adding partition with height of 1.5 meter in these layouts can solve other privacy problems in these layouts, which include lack of explicit boundaries, and acoustical privacy while the other positive points of these layouts still remain.

The results are different among workers who work in CP layouts. While workers in these layouts experience high level of visual privacy because of working in completely closed offices, they also perceive completely closed office with walls and a door as an ideal form of barrier among workers. The small size of workspace, lack of conversation area, and existence of strangers are the main privacy problems for these workers. These problems also have effects on workers' perception about ideal size of workspace. As the results show, they chose the sufficient workspace with drawers and separated meeting space for group activities as an ideal workspace while they have this problem (lack of meeting space) in their actual settings. The workers who work in OP layouts had different ideas about ideal amount of workspace. Sufficient desk surface with drawers and conversation area with one person is the optimum workspace for them. It can be also the impact of their office layouts. As the layouts' documents show, there is a meeting space for group activities in these layouts while their office layouts have not any spaces for confidential conversations even with one person.

In general, for office workers who work in OP layouts an open-plan office layout with partition height of 1.5 meter and conversation area with one person is an ideal form of workspace layout in order to achieve optimum level of privacy. Other groups of

workers perceive a closed office layout with walls and a door, having enough desk surface, and a separated meeting area as an ideal form.

While workers in different office layouts had different ideas about the appropriate barrier among workers and workspace size, they had similar perception about ideal form of barrier among workers and strangers, desk arrangement in closed office for one worker, and desks arrangement in closed office layout that is shared by two workers.

Most of participants agreed with the walls and a door as an appropriate type of barrier among workers and strangers. Moreover, the majority of workers in both office layouts set their desk in a corner of hypothetical closed plan layout in order to have more control over workspace and window view. In the same closed plan office layout, most of the participants located two desks in the way that both of them are in the corners and have window view. They also arranged their desks in this layout with the maximum distance between the desks. Generally, workers' perceptions about desks arrangements proved that workers feel more privacy in corners of spaces and prefer to have maximum distance with other workers when the office plan has rectangular shape.

While the results of this study proved the effect of office layout on workers' perception about environmental privacy regulators and found out some appropriate environmental regulators in terms of type of barriers, desk arrangement, and workspace size, they might not generalized because of the limitations of the present study. The study limits itself and is focused on workers between 23 to 33 years old as new generation of workers who are more impressed on information era. Moreover, their job type is also

specific. In order to generalize this subject, the same studies should be conducted in different cases with different ages, genders, cultures, job complexity, and job status etc. The other limitation was the impossibility for choosing more appropriate sample with larger amount of participants. Unfortunately, from 36 of assistants in Faculty of Architecture 26 of them participated in this research. Because of this limitation, the differentiations across various genders also were not considered.

Chapter 7

CONCLUSION

Individuals will have maximum satisfaction and minimum stress through spending their time in the buildings that are designed by focusing on physiological, psychological, and sociological needs of human. In the human behavior (HB) studies, privacy is in the center of psychological and sociological needs of human beings, which they use for controlling the space. In addition, privacy is linked with the other sociological needs of individuals such as territory, personal space, and crowding. Furthermore, by enhancing privacy level in designed buildings the other social needs of human would respond.

The concept of privacy is recognized as one of the significant concepts in work environment that has direct effect on workers' behavior, their physical and mental health, and their productivity. Workers who work in the workspaces with desired level of privacy are able to regulate their process of interactions; it means they are able to choose the type of interaction, the length of interaction, and the case of interaction.

Because of the importance of privacy in the work environment, different environmental privacy regulators have been generated in order to solve this issue in time. Based on the findings of present study, the environmental privacy regulators changed in different office layouts from creating completely closed offices with four full height walls and a door, to design open-plan layouts and separating workers by

partitions. Moreover, the types of activities that were done in different layouts, were the most important factors that have been considered in order to use different environmental privacy regulators.

Based on findings of this research, four full height walls and a door provides maximum level of visual privacy for workers. These types of office layouts have been suggested for complex jobs and for workers in high positions in the corporations. Different studies suggested that these types of layouts are not suitable solution for workers with routine jobs. They claimed that desired privacy level in these jobs can be provide by partition height 1.5 meter in seating position and 2 meter for standing positions.

In terms of workspace size the results of this study found that, the smallest workspaces should have enough space to facilitate with a sufficient desk surface and a conversational area with one person. Most of the workers with different job types are able to regulate their interactions in this amount of space; accordingly, they will obtain desired level of privacy in this situation. The workspace size for employee with high rank should be divided into three areas, which include a work surface area usually a large desk, an informal conversational area comprising of a couch, and a conference area involving a table with minimum six chairs.

The appropriate desks arrangements occur when the desks are positioned in the corners of rectangular workspaces. Moreover, arranging desks in the way that workers have window view and view of iterance will provide maximum level of privacy for workers.

While several studies proved these facts during the years, in order to prove the applicatory of these facts in the age of technology, a pilot study is done among assistants in Eastern Mediterranean University, Faculty of Architecture.

The findings proved that the existence of barriers is one of the significant environmental privacy regulators that participants need for visual and acoustical privacy. Working in the situations that their data is invisible for other workers would not provide desired level of privacy; workers need their specific boundaries and territory through having the barriers.

However, in the present study, the participants were the office workers that most of their activities were related to use of network world, they still need to have rich (face-to-face) communication with others. Accordingly, while the participants who work in spaces that are more communicative, had privacy issues, they still prefer to work in the spaces that high level of interaction for them while they have own boundaries.

Generally, designers and facility planners should provide a specific space for each employee with conversation area (minimum with one person) in order to provide acoustical and visual privacy for workers. In addition, separated meeting spaces should be considered in their designs in order to improve the communication process between knowledge workers. In these layouts, workers would have more informal and face-to-face communication and do their job activities with more commitment. The mentioned layout would provide optimum level of privacy for workers when workers are able to communicate with others more easily and feel no invasion on their own workspaces territory when it has separated with barriers. Consequently, workers may feel optimum level of privacy in workspaces if the other privacy mechanisms have been provided.

While the results of this study proved the effect of office layout on workers' perception about environmental privacy regulators and found out some appropriate environmental regulators, but to be able to generalize the findings of present study it should be done more appropriate sample with larger amount of participants. In order to generalize this subject, the same studies also should be conducted in different cases with different ages, genders, cultures, job complexity, and job status etc.

In sum, based on the findings of this research author suggests to designers of work environments, depends on the needs of organizations, if it is possible; give opportunity to workers to have both private office and different area for communication with different level of privacy. It would be the most important thing in terms of environmental privacy regulators that assigned workstations to each workers have explicit boundaries even the workers are working in open-plan layouts.

Author hope that the findings and suggestions of this study help organizations and designers to take great steps in improving quality of indoor spaces of work environments.

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APPENDICES

Appendix A: Interview Questions

How long do you stay in your workspace during a day, averagely?
What are the different kinds of activities you do in your workspace?
What kind of equipment you need for doing your activities?
Is the existing equipment in your workplace sufficient for doing your activities?
Which factors disturb your concentration in your workspace when you are doing your tasks?
Are you satisfied through the arrangement of desks in your workplace? If not what is your suggestion to improve it?
Do you feel that the amount of persons in your work area is more than the capacity of space?
Do you think that the distance of workers in your office is appropriate?
Are you able to talk on the phone privately or having confidential conversations with others in your workplace? If not what are you doing in this situations?
Are the environmental background noise such as ventilation systems, others conversations or music annoy you in your workspace?
Do you feel privacy in your workplace?
What design features you need to achieve more privacy in your workplace?
In what situation do you need more privacy in your workspace?
How concerned are you about security of your personal tools and computer's data when you are not in your office?
How do you interact with your Colleagues during your workday? (Face-to-face or electronic communication).

Appendix B: Original Version of Questionnaire

I am a master student in EMU. I am doing a research project on **workers' perception about privacy** in workspaces. I would like to seek your help for conducting this research. I hereby assure you that all the information will be used for academic purpose only and will be kept confidential.

General information	**Gender**		**Nationality**				**Age**
	Female	Male	Turkish	Iranian	Cypriot	Other	

1. How long do you stay in your workspace during a day, averagely?							
Less than 2 hrs.		Between 2 to 5 hrs.		Between 5 to 8 hrs.		More than 8 hrs.	

2. How many office-mate(s) do you have?													
one		Two		Three		Four		Five		Six		More than six	

3. What kind of relations do you have with your office-mates?							
Completely friendly		Completely formal		Mostly friendly		Mostly formal	

4. What kind of activity(s) you do in your workplace most of the time? (You can choose more than one item).	
	Doing department duties.
	Studying courses.
	Giving critics to students.
	Using computer for researching and checking social network accounts.
	Group activities.
	Nothing special. I prefer to do my activities out of my workspace.
	Other …….

5. Which factor(s) disturb your concentration while you are working?	
	Co-workers circulation in work area.
	Closeness with other co-workers.
	The small size of workplace.
	Outdoor noise.
	Co-workers conversations or noises.
	Existence of strangers in office.
	Lack of required tools.
	Other ……..

6. How is your feeling about your workspace? Mark one item from strongly agree to strongly disagree.	Strongly	Agree	Neutral	Disagree	Strongly
My workplace boundary is explicit and is used only by myself.					
I feel crowded in my workspace.					
The work surface is enough for my job activity.					
I feel isolated in my office.					
My office-mate(s) are reliable.					
I have appropriate facilities in my office.					
My workspace is suitable place for concentrating on job activities.					
I am able to have confidential conversations in my office.					
I am concerned about security of my personal tools while I am not in office.					
I have face-to-face interaction with my co-workers rather than electronic communications (phone, e-mail, social networks, etc.)					
I am satisfied through arrangement of desks in my workspace.					
The co-workers' distance annoy me while I am working in workspace.					
I have sufficient privacy in my workspace.					
I can communicate with people that work together easily.					

7. Do you prefer to have barrier with your co-workers?					
	Yes		No		

If your answer is **YES**, which types do you prefer?	
	The workplace completely closed with walls and a door.
	The workplace with 2 meter height partitions (no one can see you while you are standing)
	The workplace with 1.5 meter height partitions (no one can see you while you are seating)
	Other……

If your answer is **NO**, what is your reason?	
	The existence of walls and partitions are not important while my personal computer's information is invisible.
	The existence of walls and partitions are not important while the desk arrangement and co-worker distance be appropriate.
	The existence of walls and partitions are not important while my personal tools are secured.
	Other ……...

8. Do you prefer to have barrier with other people in your work environment?					
	Yes		No		

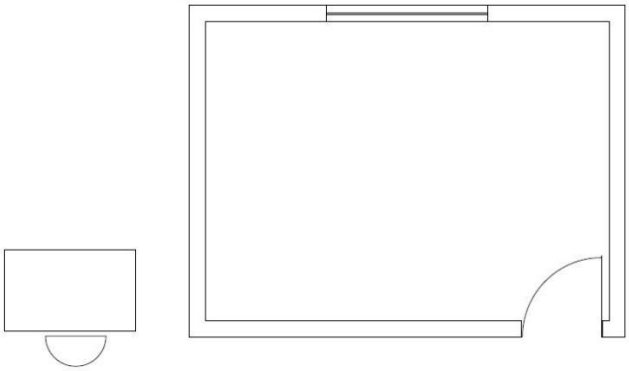
If your answer is **YES**, which types do you prefer?	
	The workplace completely closed with walls and a door.
	The workplace with 2 meter height partitions (no one can see you while you are standing)
	The workplace with 1.5 meter height partitions (no one can see you while you are seating)
	Other…… ..

If your answer is **NO**, what is your reason?	
	The existence of walls and partitions are not important while my personal computer's information is invisible.
	The existence of walls and partitions are not important while the desk arrangement and co-worker distance be appropriate.
	The existence of walls and partitions are not important while my personal tools are secured.
	Other ……..

9. The ideal space that you need for your job activity(s) should have enough space for:	
	Sufficient desk surface with drawers. (A)
	(A) + a conversational area with one person.
	(A) + a conversational area with two persons.
	(A) + a conversational area with more than two persons.
	(A) + having a separated meeting place for doing group activities.
	Other ……..

10. What do you think that an ideal office should be? Mark one item from strongly agree to strongly disagree.	Strongly	Agree	Neutral	disagree	Strongly
Have a quiet space for concentrating on jobs' activities.					
Have potential for doing group activities.					
Have solid walls and a door.					
Be able to talk privately on the phone.					
Not be overheard by others.					
Be invisible to co-workers by partitions.					
Be invisible to strangers by barriers (walls or partitions).					
Do not have concern about your personal tools and computer's data.					
Be able to have face-to-face interaction with other workers.					
Have separate meeting space for group working.					

Have lockable shelves.					
Having adequate storage space.					
Have sufficient work surface space and equipment.					
Have a workplace with lockable door.					
Having groups that work together located close together.					
Having my workspace located away from the main traffic flow.					
Having easy access to reference materials.					
Having minimal traffic routed through my area.					

11. How do you arrange your desk in below office?	**Why do you choose this arrangement?**
	☐ Having outdoor view ☐ Do not let strangers to see your data ☐ Having view of entrance ☐ More control over workplace ☐ Other ……

12. How is the best desk arrangement for an office with two workers?