

MULTI-GENERATIONAL WORKFORCE AS A USER GROUP: A STUDY ON
OFFICE ENVIRONMENTS

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submitted by **ERİNÇ EREL** in partial fulfillment of the requirements for
the degree of **Master of Science in Industrial Design Department,**
Middle East Technical University by,

Prof. Dr. Canan Özgen
Dean, Graduate School of **Natural and Applied Sciences**

Assoc. Prof. Dr. Gülay Hasdoğan
Head of Department, **Industrial Design**

Dr. Canan Emine Ünlü
Supervisor, **Industrial Design Department, METU**

Examining Committee Members

Assoc. Prof. Dr. Çiğdem Erbuğ
Industrial Design Department, METU

Dr. Canan Emine Ünlü
Industrial Design Department, METU

Asst. Prof. Dr. Owain Pedgley
Industrial Design Department, METU

Inst. Figen Işık
Industrial Design Department, METU

Asst. Prof. Dr. Mine Ovacık Dörtbaşı
Industrial Design Dept., İzmir University of Economics

Date: December 8th, 2009

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: Eriç Erel

Signature:

ABSTRACT

MULTI-GENERATIONAL WORKFORCE AS A USER GROUP: A STUDY ON OFFICE ENVIRONMENTS

Erel, Erinç

M. Sc., Department of Industrial Design

Supervisor: Dr. Canan Emine Ünlü

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Today, as a result of the improvements especially in the area of medical sciences, conditions of life have changed and the work period has been prolonged. Currently more than one generation has been living together, and even working together. In recent years, it is observed that generationally diverse environments and product or services addressing multi-generational user groups have attracted the attention of particularly the marketing sector and this attention to the generational diversity has become a trend in the design field just as it has in many other areas.

This study analyses the design assets of the office environments from the perspective of the important characteristic of the workforce, namely the generational diversity. Designing the office environment by taking only the current and future generations into consideration is not a sufficient way anymore. So, office designers are expected to consider also the older generations existing at the same environment. This trend towards generational diversity has started with the designs and arrangements of home environments; later, due to the advantages it has provided for the organizations' success, it has gradually spread towards the designs of office environments.

In this study, the work habits of generations have been analyzed initially and then it has been related to the office environments and work cultures. At the end of the study, the effects of multi-generational workforce on the office environment design assets have been discussed.

Keywords: Office Environment, Multi-Generational Workforce/Personnel, Multi-Generational Office Environments, Generational Diversity, Office Design Assets

ÖZ

KULLANICI GRUBU OLARAK ÇOK-NESİLLİ İŞGÜCÜ: OFİS ORTAMLARI ÜZERİNE BİR ÇALIŞMA

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Günümüzde, özellikle tıp alanındaki ilerlemeler sayesinde hayat şartları gelişmiş ve yaşam kalitesi artmış dolayısı ile çalışma süresi uzamıştır. Bunun sonucu olarak, aralarında birden fazla nesil farkı olanlar bir arada yaşamakta ve hatta çalışmaktadır. Son yıllarda, çok nesilli ortamların ve birden fazla nesile hitabeden ürün ve servislerin özellikle pazarlama sektörünün dikkatini çektiği gözlenmektedir ve tabii ki, nesil çeşitliliğine önem verilmesi birçok alanda olduğu gibi tasarım alanında da akım haline gelmiştir.

Bu tez, ofis ortamlarının tasarım değerlerini, günümüz çalışanlarının önemli bir özelliği olan 'nesil çeşitliliği'ni göz önüne alarak incelemektedir. Ofis tasarımcılarının tasarımlarını gerçekleştirirken sadece bugünkü ve gelecek nesilleri dikkate alması yeterli olmamaktadır. Artık tasarımcılardan, aynı ortamı paylaşan ve hedef kullanıcı kitlesinin önemli bir bölümünü teşkil eden 'eski' nesillerin karakterlerini de göz önünde bulundurmaları beklenmektedir. Nesil çeşitliliğine önem verilmesine yönelik bu eğilim, ev ortamlarının tasarımı ve düzenlenmesi ile ilgili alanlarda başlamıştır ve iş dünyasındaki organizasyonların başarısına olumlu etkileri doğrultusunda ofis ortamlarının tasarımı konusunda da giderek yaygınlaşmaktadır.

Bu çalışmada, öncelikle nesillerin çalışma alışkanlıkları incelenmiş olup ofis ortamları ve iş kültürünün tarih boyunca gelişimi ile ilişkilendirilmeye çalışılmıştır. Çalışmanın sonunda çalışanların çok nesilli olmasının ofis tasarım değerleri üzerindeki etkileri tartışılmıştır.

Anahtar Kelimeler: Ofis Ortamı, Çok-nesilli İş Ortamları, Çok-nesilli İşgücü/Çalışan, Nesil Çeşitliliği, Ofis Tasarımı Değerleri

To My Father
Can Erel

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CHAPTER 1

INTRODUCTION

People who belong to different generations have started to share their daily life for more than any other time in the history due to the improvements in medical sciences and preventive medicine which reduced the weaknesses of old age and increased the duration of life time. Therefore, the concept of “elderly” has changed in definition and the age range defined for the elderly has extended to the older ages. As a result, the society which has become multi-generational is consciously in demand of comfort and quality of this collectively shared life in higher levels.

Acknowledgement of multi-generation as a new feature of the society influenced life in general; the subject has gained interest in many areas. Multi-generational views on design has started to take its place near the recent trendy concerns such as the sustainable, greener society considerations in purpose of making life healthier, longer and better in quality.

As human beings, from the age 7 to 70, we are present at many kinds of environments and encounter a large variety of products while experiencing our daily lives. Nowadays, considering the evident efforts in making life experiences better in quality, it can easily be said that the people’s expectations from these environments and products are higher than ever. Therefore, due to its basis of existence, the design profession is expected to contribute to all kinds of conditions in all kinds of public and private environments with products including environments of transportation, education or health services, home environments, and all kinds of work and business environments.

Design for multi-generational user group, namely multi-generational designing, is a new trend and it has been initially applied in the home environments as one of the principles of universal design. The approach of universal design aims to make every product and service accessible for all age groups that have variety of abilities or disabilities while designing anything and everything in home environment, consciously enabling all kinds of experiences regardless of age and ability to be at the similar quality level ("Multi-Generational Design the Hot Trend at Home", 2009). On account of its objective, design for multi-generational user group is likely to be discussed for every environment that more than one generation is experiencing, especially for the public spaces.

Recently, multi-generational characteristic of a society is fundamentally tracked in consumer market and job market (The Center for Generational Studies, [CFGs], 2009); in addition, the generational differences in characteristics emerge more clearly as they interact and communicate for a common purpose in work environments, which are the main subject of interest of this thesis.

1.1 Motivation for the Study

Working has been a part of human life for as long as they live. The environment to work has been exposed to transformations as the nature of work did throughout the years that generations have lived. And, as each new generation lives through a period of time that is slightly different than the previous generations, characteristics of common aged people are structured upon unique backgrounds different from each other.

Nowadays, older generations continue to be presented in work environments longer—due to aforementioned reasons. Furthermore, for the first time in the history, this condition of today has led 'four generations'; Traditionalists, Baby Boomers, Generation X and

Generation Y, as defined and widely used in the related literature, to be working and sharing common environments together and office environment has become the place that generations work hand in hand for a common purpose and has shown their distinctive individual characteristics (Hammil, 2005) (Figure 1.1).

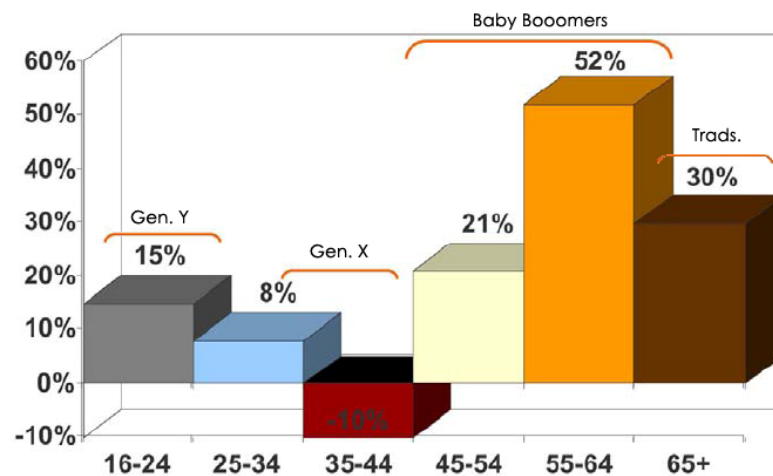


Figure 1.1: Percent growth of US workforce by age; projection for 2014 ("Managing Multiple Generations in the Workplace", 2007)

Each generation dominated the workforce during their existence. As the dominance shifted from one generation to the other, the way the work environment has shaped has been influenced in relation to the new dominant generation's characteristics. So, the office environment has come to its present condition indirectly by the dominant generations who are characterized by what they have lived throughout their lives. Generational differences had affected the transformation and development of these environments. In fact, at the initial year of the history of offices, work and work environment has shaped the work habits of the generations of that time. As following generations participated in the same work environment, the characteristics of this new generation have also brought a new perspective in work

environments and influence the way they are. This mutual relation between the workforce and the work environment has led the transformations and developments in both the design work environment and the work habits of each generation present in that work environment. In figure 1.2, differences between the traditional and new workforce influencing the office environment has been emphasized through the interrelationships within an organization (Raymond & Cunliffe, 1997).

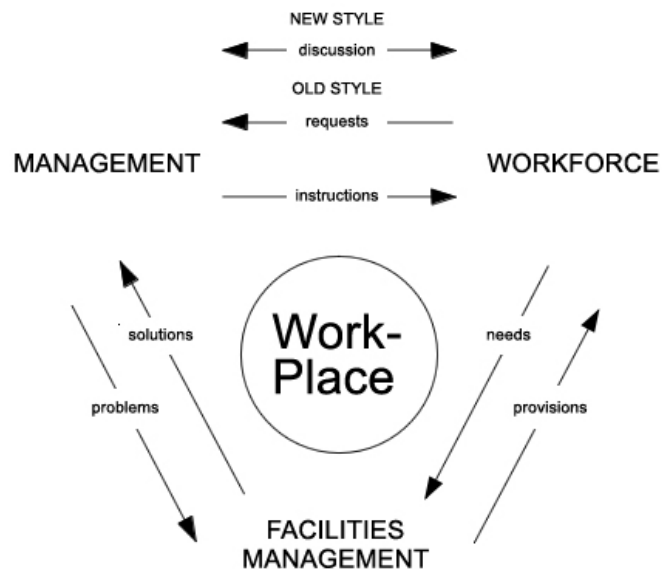


Figure 1.2: Dynamics in the Workplace (Raymond & Cunliffe, 1997)

As seen above in Figure 1.2, office environment is shaped by the organizational influencers. The environment acts like a medium where management communicates with the workforce by using design as a tool; either by the requests coming from the workforce and by turning them into solutions, or as problems of the management turns back to the workforce as solutions to support the work of employees. However, the communication between the management and the multi-generational workforce has been transformed into a more open communicative way.

Hence, it is a necessity for the organizations to realize their workforce with their multi-generational quality.

In addition to the above motivations, due to the condition of the author being employed in an office furniture manufacturing company as an industrial designer, a study on multi-generation as a design consideration in office environments was thought to be needed primarily for the office furniture and office environment designers and for the office furniture and supplies manufacturers in purpose of enriching their perspectives through multi-generational point of view. Additionally, the outcomes of multi generational design approach towards the office environments might enable organizations to enhance the generational diversity of their workforce and value each generation's characteristics for the ultimate effectiveness of their performance levels. Hence, it is crucial to be aware of the multi-generational fact and its potential by all means.

1.2 Purpose of the Study

There is an obvious mutual relationship between the dominant workforce generation and the transformation in the design of work environments throughout the history. The purpose of this study is to designate the characteristics of today's multi-generational structure of office environments by exploring the office environment and the current generations of today's workforce; to explore the relation between generations and office environments by monitoring the evolution of office environments from generational perspective; and to relate characteristics of each generation with design assets of today's office environments in order to emphasize the importance of multi-generational workforce as a design consideration while designing office environments

Recently, regardless of its dominance, every generation is seen as a value for the success of an organization and it is organizations' conscious intention to obtain effective work conditions through the design of work

environment suitable for each generation. For that reason, it is aimed with this study to discuss the issues of today's work environments through the distinct characteristic of each generation which is needed to be taken into consideration while shaping work environments in the most effective way possible.

Thus, the main research question of this study is as follows:

- How does today's multi-generational workforce influence the assets of office environment design?

This study also serves for finding answers for the following sub-questions:

- What are the characteristics of generations which are the constituents of multi-generational structure of today's workforce?
- How has work and work environments changed over generations?

The goal of this study is to deliver a source about the place of generational diversity in office environment and its reflection upon its design, especially consideration of generational diversity in recent approaches toward office environment design. This study of MULTI-GENERATIONAL WORKFORCE AS A USER GROUP: A STUDY ON OFFICE ENVIRONMENTS can be regarded as one of the rare studies in academic literature, since it is an up to date source which analyzes office environment design from multi-generational perspective. As this study is a collection of information on generations, their relationship with office environment and its consideration in recent office environments, office designers can benefit from this study in order to relate with the insight of generations working in the recent office environments, and the office furniture manufacturing companies can use this study as a guide to understand the diversity of generations as a necessary feature of their target users and it can enable them to design and produce more precise

products for the betterment of performance of each generation which is equally valued by organizations.

1.3 Limitations of the Study

In this study, the information gathered from the literature on generations and their individual characteristics is mainly based on the American sources, hence U.S. is the pioneer country on the advancements in industrialization and economy; and the data is based on the society of US and their national birth curve. However, it is realized from the scarce studies on the other countries, that the main frameworks drawn for the generations do not have drastic differences compared to the USA.

When the information in the literature is analyzed in individual scale, although the characterizations of generations has been claimed by common backgrounds, there is always a possibility of having an individual belonging to a specific generation however, owning a personality that does not overlap with that generation at all.

With all these limitations about the background information of this study in mind, the following sections will be built upon the worldwide accepted notion of generation, its categorization and characteristics belonging to each categorization filtered from recent literature.

Furthermore, this study mentions the multi generational workforce of a specific type of office environment. In other types of the office, the emphasized relations between generations of the workforce the assets of that specific office type may differ.

On the other hand, although it mentions the design features and components of office environments to a certain extent, this study deals with the office environments in general means and avoids giving special attention to the components of offices separately; otherwise, that kind of a study requires a different perspective to the subject. As far as the

reviewed literature shows, there exist neither information about the relationship between the generations and reflections of their characteristics on the components of work environments nor the studies dealing with the work environment components from the multi generational perspective.

1.4 Structure of the Study

This thesis study is based on a broad literature survey conducted in order to find answers to the research questions. Related literature was scanned between 1960s-2000s in Middle East Technical University and Bilkent University Libraries' collections and databases and in some leading electronic databases like EbscoHost, ACM Digital Library, Wiley InterScience, and Elsevier.

In order to pass on the information about what generations are and how each came in to life, the keywords *generation*, *generational theory*, *generational differences* and *generations in workplace*, are used. In parallel to generations, the evolution of office environments was searched through the keywords *history of office design* and *background of offices*. The general information was obtained by the keywords *office design*, *office environment*, *workplace design*, and *workplace*. These keywords revealed today's office issues, and for more detailed information to reveal the key stones of office environment, the keywords *new work*, *new work environments*, *office experience* and *workplace values* were inquired. As the last step, *future office*, *future workplaces* and *technology in workplace* were the words to search for more detailed information about what office environments are coming to be in detail.

In academic literature, the researches on generations in work environments are condensed on the subject of their motivations and characteristics in order to find solutions on how to make these different generations work together, apart from this subject, there is not much academic research study which coincided with the design perspective.

Thus; because of the insufficiency about the multi-generational perspective on the work environment design in the literature, the author has especially taken the researches and articles published by worldwide known office furniture manufacturing companies, like Steelcase Inc., Herman Miller Inc., Allsteel Inc., Knoll Inc., Haworth Inc., and Wilkhahn Inc., into consideration. Majority of the information about generations, the current status of office environments and their inspiration of change, and the information about the latest generation were obtained from these companies' sources on the Internet. Office and design magazines, business journals and daily newspapers were also scanned concerning interpretations about generations and their relations to office environments.

The following chapter briefly introduces the office environment with its features and investigates the notion of generation as well as exploring the generation at recent office environments. In third chapter, the evolution of office environment design is undertaken by overlapping the information on characteristics of generations. Chapter four focuses on the current situation in office environments reasoned from the dominance of the latest generation and its outstanding life style and its reflections in office environments. And strategies are discussed for the adequate office environment design taking multi-generational influences in consideration.

In the final chapter, conclusions are drawn by reconsidering the information gathered from the literature review and the findings on the generations and their relationship with office environment design. Importance of multi-generational characteristic of workforce in office environment is accentuated. Later, further studies on a similar subject are suggested according to the lack of information and gaps of information in the academic literature. And finally, some suggestions are made in the direction of strategies that are mentioned in the literature about managing generational diversity in office environments.

CHAPTER 2

MULTI-GENERATIONAL OFFICE ENVIRONMENTS

The ways of how to keep the position within the global market is shifting as organizations wrestle with the conflicts of doing business in today's highly competitive global economy ("Measures of Success", 2007). In the recent world of business, intellectual property and knowledge are more taken into consideration than before. In order to foster creative thinking and collaborative work, organizations feel and consider the necessity of integrating and prolonging vastly evolving technology to every phase of work and workplace, namely 'the office'. Offices are the places where businesses shape to constitute the appropriate, work supporting environments which aims to contribute to the success in the global challenge ("Measures of Success", 2007).

There are three objectives that trace the routes of an organization to success which are defined by the Commission for Architecture and the Built Environment (CABE) (2005):

efficiency, making economic use of real estate and driving down occupancy costs – getting the most from the money,
effectiveness, using space to support the way people work, improving output and quality – getting the most from the people; and,
expression, communicating messages both to the inhabitants of the building and to those who visit it, to influence the way they think about the organization – getting the most from the brand (p.7).

Efficiency was the dominant objective that was used up to now while employers tried to carry the organization to success. As humanitarian concerns started to rise, effectiveness replaced the objective of efficiency. In relation to the shifting generations' characteristics,

mechanical communication in offices shifted and offices became places of social contribution in accordance with having effectiveness (CABE, 2005). In order to improve organizational effectiveness, workplace is used as an adequate intermediary to project the organizational change in terms of design (Tobin, 2004). Therefore, it became the duty of organizations, to provide an appropriate work environment design in the newly distinguished advantage of the multi-generational workforce.

Due to the hours spent in these spaces, offices have a considerable impact on daily life. Individuals in the modern society are spending a great amount of time on working as part of an organization while performing the action of work. Office space, acts like a medium with its components that has potential influence on employees both physically and mentally; hence the performance of work.

2.1 Office Environments and Office Design Features

Autonomous from time, the office is composed of workspaces for individual work, informal and team meetings with an archive to keep records, which is the computer in this digital era, storages for personal and work related stuff, quiet rooms for focused working and hot desks which serve as an instant information exchange source in the offices; formal meeting areas of council meeting rooms, meeting rooms and viewing rooms for educational sharing; services for daily activities like eating and common areas where people come together for other purposes rather than work itself directly ("Analysis of modern office furniture design features", 2009). These components had stayed constant within the fundamental needs and requirements of an organization; furthermore they have changed shape, function or conjugated within each other through time.

Furniture in offices is the main medium for office designers to use design as a tool and create the required environments for organizations. In

addition, the building with its every detail serves for the same purpose as well. The lightening (daylight), acoustics (sound absorbing environment), air circulation (quality air) and temperature (appropriate temperature) are the criteria for an employee to decide where s/he would like to work; and it would be beneficial if these components are able to meet the requirement of the actual employees as well and are to be fulfilled by organizations in best interest of their workforce.

In the literature, the definition of `office` has derivatives in relation to what specialization is studying on the subject such as, architectural discipline mentions as `workspace`, and psychology discipline as `working environment`. By having the standpoint of this thesis to the diversity of components and features of these spaces, the terms of `work space`, `work place`, `working environment` or `office` will be mentioned as "office environment" throughout the study since the study holds and investigates the concept of office with its environmental qualities as a whole.

The importance of multi-generation as consideration in office design has transformed this subject into a new and different work area and has its own valuable parameters; therefore, over time, different approaches have emerged in this area.

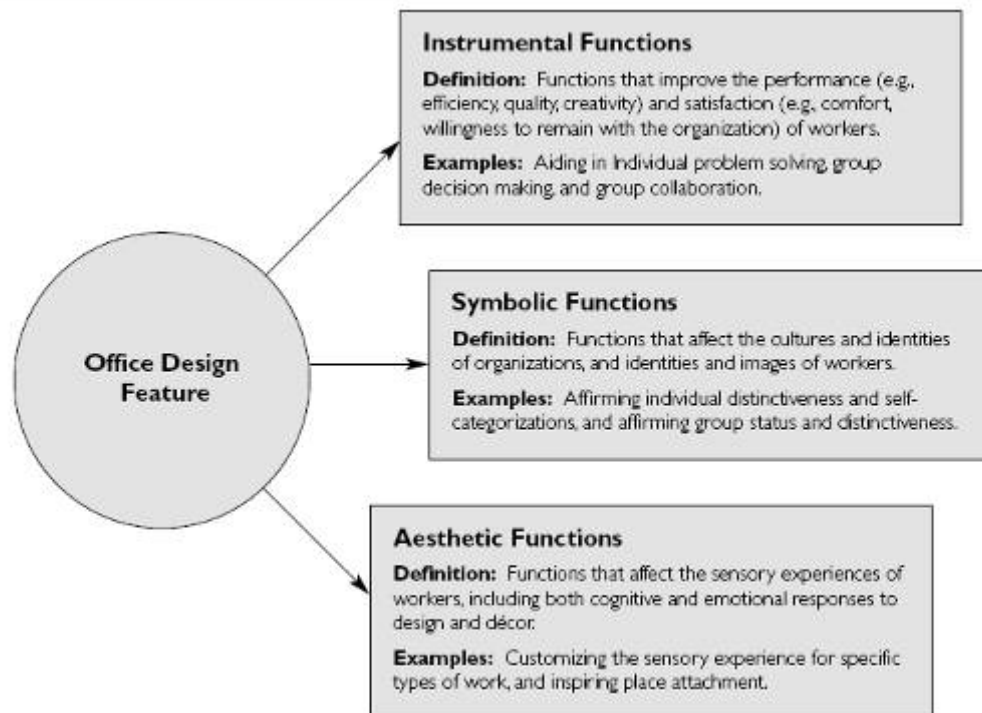
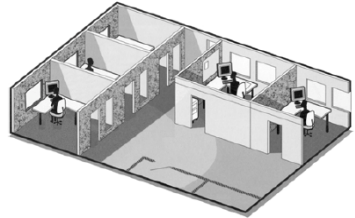
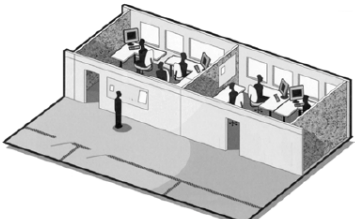
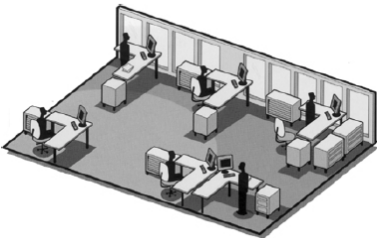
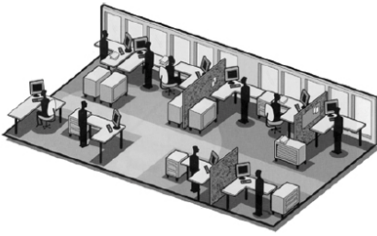
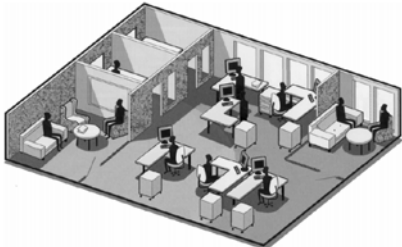


Figure 2.1: Framework of Office Design (Elsbach and Bechky, 2007)

The framework of Elsbach and Bechky (2007) educates the settled understanding of office environments from the design perspective and its possible relation with the organization (Figure 2.1). In addition, the study of Danielsson (2008) on office experiences has shed light on these features with her overlapping separation of office environments as physical structure; functional design, placement and type of office, physical stimuli; the features that are perceived and evaluated by workforce like noise, privacy and ambient factors like temperature, air quality, lighting and symbolic artifacts; status cues and image of the organization.

According to the population of the offices, and their architectural and functional features, there are five types: cell-office, shared-room office, small open plan office, medium-sized open plan office, large open plan office, flex-office, and combi-office (Danielsson, Bodin, 2008) (Table 2.1).

Table 2.1: Feature of Office Types (adopted from Danielsson, 2008 and Danielsson & Bodin, 2008)

The Cell-office	<p>A single person</p> <p>Layout definition by rooms of the architecture</p> <p>Office work is highly concentrated and independent</p>	
The Shared-room office	<p>2 to 3 people</p> <p>Team work based organization</p>	
Small Open Plan Office	4 to 9 people	
Medium Open Plan Office	10 to 24 people	
Large Open Plan Office	More than 24 people	
The Flex-office	<p>Flexibility of employees and accessibility to back-up space for teamwork, concentrated work and meetings, so on</p> <p>Dimensioned having the mobile working trend in consideration</p>	
The Combi-office	<p>Work through communication and interaction defines spatial layout, no strict definition</p> <p>Flexibility of employees and accessibility to back-up space for teamwork, concentrated work and meetings, so on</p>	

Except the cell office, all office types represent collectivity in office environment. This study is dwelled on the combi-offices which include more than twenty-four people in a shared space, because this type of office is flexible to organizational change and suitable for flat structure in which generations can communicate thoroughly according to the working requirements of knowledge economy as well as the widespread use of these kinds of office by today's organizations which harbor white collar employees managed by flat hierarchal structure.

Although the need to work effectively did not change since the 19th century, the current needs of employees to work effectively have changed by the fundamentals of the contemporary economy and nature of work and led to the way of division in office space.

2.2 Generations

With the expansion of economy throughout the years, office environments have been exposed to the process of change. However, apart from all the changes in economy, the influence of generations is a dominant factor that contributed to the changes in nature of work and workplace. Attitudes and principles, each generation has, influenced the way the office environments have evolved. Especially, the latest generation's attitudes towards work and work style formed as they were born into the digital age, and this has affected the state of today's office environments.

Recently, the office environments started to keep pace with the change of nature of work according to the new era of knowledge economy. Collective intelligence became the indispensable outcome of the information sharing through collaboration and it is highly valued by organizations. In order to get most out of knowledge creations, organizations hire employees from a widespread scale of age. The variety of people from different backgrounds especially from different age groups

has drawn different habits of working and different consciousness levels about the efficient way of working. As Allsteel Company, a worldwide known office furniture manufacturer, states that the rich variety of employees also enables the organization to behave more rich in the quality that the information is being produced (Managing Multiple Generations in the Workplace, 2007). Especially, the colorful diversity of generations enables different aspects of ideas to come together for the benefit of an organization.

2.2.1 Notion of `Generation`

As quoted by Clarey (2009) generation is defined as "... a common age location in history and a collective peer personality." by William Strauss and Neil Howe, demographers and historians, and the founders of 'generational theory' mainly based on the American society. However, there are many works on the generational diversity in office environments as workforce and almost all are based on the works of Strauss and Howe.

It can be drawn from their definition of `generation` that they refer to something more than the age boundaries that separates different generation from each other; there are also some attributes that comes from the history lived by each generation. Strauss and Howe put them into three categories:

- Perceived membership: The self-perception of membership within a generation that begins during adolescence and coalesces during young adulthood.
- Common beliefs and behaviors: The attitudes (toward family, career, personal life, politics, religion, and so on) and behaviors (choices made in regard to jobs, marriage, children, health, crime, sex, drugs, and so on) that characterize a generation.
- Common location in history: The turning points in historical trends (e.g., from liberal to conservative politics) and significant events (e.g.,

the Vietnam War) that occur during a generation's formative years (adolescence and young adulthood). (Reeves, 2006, p.4)

These three features of generations not only shape the characteristic of a generation but also make a generation distinct from others. In 'generational theory', Strauss and Howe claim that each generation has its own life cycle that is separated into four pieces which they call 'turning'. According to the 'generational theory', during each turning point, it is supposed that a new generation is born and each generation's characteristics are influenced by the orientation of the turning in which that generation is born. However, as the generations age goes up a phase, their matured characteristic that plays a social role in that specific society affects the society's orientation and causes change in that society ("Generation Watch", 2007).

2.2.2 Generations and Generational Diversity

Life experiences of people that are born in closer periods resemble to each other. Each generation has its own characteristics which are shaped by these common experiences through its life and their categories are named after a specific phenomenon that the society lives through those specific years.

As stated in the Center of Generational Studies' sources (2009), the characteristics of each generation that experienced common shares through their life time period are specified by the analysis of the way they act and behave as they enter the consumer market and job market in at least 7-8 years as the distinct patterns or their characteristics can be observed and traced. Their consumer patterns and workplace attitudes as well as their working behaviors define their profiles.

Western countries, especially the USA, have the most definite studies on generations of a certain academic quality, due to their prestigious position that they have played in the most critical global and national occurrences of the world like wars, aging populations, culture, and so on.

Therefore, it should be mentioned here that the recognized categorization of current generations in the literature is mainly related with the US society (CFGs, 2009). Although other countries also have attempts on defining their society's generations based on the information of the US, their specifications are based on approximations (Notter, 2002). On the other hand, their findings are closely relevant to US specifications because they went through the same global occurrences.

In the recent literature, there are four defined generations who have distinctively shown their characteristics in the consumer and job markets. Because of the worldwide interest in the subject, the time periods and the given names of the generations vary, however since studies based on this subject is more comprehensive and extensive, the categorization of Center of Generational Study will be taken as the base of this thesis study.

Workforce is a dominant factor affecting and getting affected by the management style and work ethic in organizations, resulting in shaping the design of the office environment in which a mix of generations exists. It has been a question whether this relation has been a challenge or opportunity for organizations.

Until recent developments on the perspective of generational diversity, the variety was perceived in a hierarchical level (Becker, 2009). However, today in most countries this level of hierarchy of generations is in the process of getting flattened and generations have started to work side by side.

2.2.3 Categorizations of Generations

There are different interpretations on the categorization of generations that Howe and Strauss have made based on their 'generational theory' (Table 2.2). Some authors have renamed or re-defined the periods of generations in different ways. This variety in categorization of generations can be explained by the ambiguous state of the borders of

time slices of the generations. Every different group of categorization is an approximation (Notter, 2006).

Table 2.2: Different Categorizations from Various Sources (adopted from Reeves, 2006, p.3)

Howe & Strauss, 1991	*Silent Generation 1925-1943	*Boom Generation 1943-1960	*13th Generation 1961-1981	*Millennial Generation 1982-2000	
Lancaster & Stillman, 2002	*Traditionalists	*Baby Boomers	*Generation Xers	*Millennial Generation *Echo Boomer *Generation Y *Baby busters *Generation Next	
	1900-1945	1946-1964	1965-1980	1981-1999	
Martin & Tulgan, 2002	*Silent Generation 1925-1942	*Baby Boomers 1946-1960	*Generation X 1965-1977	*Millennials 1978-2000	
Oblinger & Oblinger, 2005	*Matures <1946	*Baby Boomers 1947-1964	G*en-Xers 1965-1980	*Gen Y *NetGen *Millennials 1981-1995	*Post Millennials 1995-Present
Tapscott, 1998		*Baby Boom Generation 1946-1964	*Generation X 1965-1975	*Digital Generation 1976-2000	
Zemke, Raines & Filipczak, 1999	*Veterans 1922-1943	*Baby Boomers 1943-1960	*Gen-Xers 1960-1980	*Nexters 1980-1999	

The “four generations” is a widely accepted and used categorization of generations by the researchers and the writers. This categorization is also recognized by the Center of Generational Studies. The Center cited some

events that have occurred during those specific time periods or some research findings in its sources in order to justify the “four generations” categorization:

Traditionalists (born prior to 1946): The term was coined by marketing researchers, Yankelovich Partners, Inc.

Baby Boomers (born 1946 through 1964): The term was coined by Landon Jones, author of `Great Expectations`, a book chronicling the Boomer generation.

Generation X (born 1965 through 1980): The term was coined by author Douglas Coupland in his novel, `Generation X`.

Generation Y (born 1981-1999): The term was coined by sociologists Neil Howe & William Strauss.

This widely accepted categorization has been found suitable to examine the topic of this study, because its way of defining time periods overlaps the evolution process of office environment as explained in the following sections. Hence, the following sections, starting with the introduction of characters of these four generations, are organized in this sense.

2.3 Four Generations at Work

On account of the increasing quality and duration of the life time of an individual, people are able to work longer than they did fifty years ago (“Managing Multiple Generations in the Workplace”, 2007).

In order to use these generations as a beneficial source of workforce in a well designed office environment, organizations are entitled to understand their general characteristics towards work and therefore the work environment. As long as their characteristics is clearly understood and enhanced by organizations, the working conditions for effective work conditions can be eventuated consciously in an environmental level.

2.3.1 Traditionalists

Traditionalists are the work owners from early history of the modern world that lived through major wars and depressions in history, and recently chose to work instead of retiring because of personal reasons like economic difficulty, social connectivity or personal contribution to an organization (Becker, 2009). They made up approximately %15 of the workforce (Caldwell, 2006).

This generation is impressed by the work experiences and values of their parents that the date goes back to 19th century. Therefore, their attitude towards work and organization is connected with ownership. They are the most loyal generation to organization and their priority of loyalty keeps them working (Lanchester, 2004). This generation has gathered rich interpersonal skills (Caldwell, 2006).

Traditionalists are used to work as a part of strict hierarchal structure in organizations; hence, they prefer to communicate in organization in a hierarchal structure and they expect `command and control` type of strict management (Kristy, 2007). They are hard employees and possessors of high work ethic. Nevertheless, this generation has distinct characteristics that affect the work style and office environment directly. These people who grew with a traditional understanding on working are used to working on their own. As Becker (2009) states, they grew up in `do-without` era.

Privacy is a major issue for this generation to be productive. Therefore, they do not have the expectation to share their thought to increase productivity, in the same way they do not prefer to share information about work by conversation, instead they value words more or formal face to face meetings (Lee, 2007).

Formal communication has no alternative in office environments for this generation, and socializing is an unnecessary action to take place in an office environment for them, on the other hand, according to Shinn

(2006) being exposed to informal communication through socializing changed their rigid ideas and they have started to enjoy a part of the new office environment. However, they tend to hold themselves back from technology.

This generation does not like change in general (Lee, 2007). The integration of technology in their usual working process makes them uncomfortable just as coming out of their four walled individual rooms and compromising from their precious privacy. Hence, and they are the generation who has struggled the most with these new ways of working that have arisen along with the newer generations.

2.3.2 Baby Boomers

Getting its name from the era, this generation was born after the World War II and during the economic welfare era called upon booming in births. According to the National Oceanographic and Atmospheric Association Office of Diversity, the time that this generation was dominant as workforce was called 'me' decade, because of their self centered attitude, but not in means of selfishness; this was about their self confidence and believing in themselves ("Tips to Improve Interaction Among the Generations", 2009; Twenge, 2006). Baby Boomers, as Becker (2009) emphasizes, was the first generation that was taught sharing and team work during their education within the healthy economy. Today, they are 34% of the workforce (Caldwell, 2006).

Baby Boomers have the habit of interrogating the organization as a system and desired to make change especially in more democratic and human way (Becker, 2009). Importantly, this habit has clearly shown its traces while the office environment was in the process of change. They are in need of making a difference and contribute to the organization as arising individuals as well as carrying competitive motivation and seen as egocentric individuals ("Tips to Improve Interaction Among the Generations", 2009). This type of ambitious attitude towards work brought them the name of 'workaholic' and they are seen as the

starters of this trend (Nelson, 2008). This generation's only goal is success primarily in individual level than the contribution to the organization and they are willing to sacrifice personal life to achieve professional goals. ("Embracing Boomers", 2006; Nelson, 2008; Becker, 2009; Twenge, 2006)

The difference between Traditionalists and Baby Boomers is the eagerness of this generation to question the organizational structure for the next level of success rather than performing the job just because it is the right thing to do or obeying the rules just because they are the rules ("Tips to Improve Interaction Among the Generations", 2009). They do acquire high level of respect for authority, however, they are ready to judge and challenge it if it is needed (Becker, 2009). Rather than hierarchal structure, Baby Boomers have opinions to the contrary of `command and control` type of management and they prefer a more flat and horizontal structure which steps away from the strict hierarchical status differences in office environments and treats each level of management the same because they are all part of the organization working for a collective goal of success. The intra muros (within the walls) workplace of an upper manager of traditional workplaces, has come out to an open environment which at most surrounded by glass walls in order to give the employees the feeling of working in the same equal environment with the manager.

Currently, because of their age and experience level, Baby Boomers are heavily valued for organizations especially for administrative status and organizations are willing to change attitudes towards them in respect to their characteristics of which are more beneficial for organizations when compared to other generations (Lee, 2007). Accordingly, this generation is indulged in status and materialistic for that issue; like they are in desire of their own offices and value more for the status emphasizing properties in offices especially; like the size feature in every element of office especially for storage and room (Lanchester, 2004).

Although this generation is indecisive about technology if they should depend on it or not, they are trying to keep up with it in order to maintain their positions in organization (Silver, 2009). Informal communication is accepted more by this generation and they are open to use technology in the form of electronic mail while communicating, as well as face to face communications apart from formal meetings.

2.3.3 Generation X

While Generation X was growing up, their parents were going through tough times because of economic crisis at the beginning of the 1980s. Hence, this generation has lived through possibility of an unemployed parent and separate moms and dads during their childhood because of this difficulty in economy and its reflections (Becker, 2009). Accordingly, what they have lived through influenced their characteristics. In office environments of the year 2006, this generation made up approximately %18 of the workforce (Caldwell, 2006).

Generation X is also recalled as 'latchkey kids' which means that their parents were always working when they grew up and they have learned to take care of themselves; therefore, this generation owns an independent soul (Caldwell, 2006, Becker 2009). This characteristic along with their distrust coming from the economic crisis period makes this generation entrepreneurs. They have an objective of developing themselves as an individual rather than as a part of organization, in addition they do not trust the management level of the organizations and do not believe in loyalty ("Tips to Improve Interaction Among the Generations", 2009). Notter (2002) justifies these characteristics of Generation X by explaining that this generation witnessed corporate downsizing by being the first generation that was hired after this restraining in workforce.

However, the reflections of the crisis in their lives made them very adaptable to change and it is a rule in their lives (Notter, 2002). On the other hand, their individual behavior brought some different working

habits into office environments; this generation prefers to manage their own time, solve their problems without any supervision. Contrary to Baby Boomers, this generation works to live; yet, they would like to work wherever and whenever they want, as long as the work is being done so they can have more time for living (Nelson, 2008).

Generation X is fun at work, they do not prefer dealing with authorities and they do not have ambitions like competitions as Baby Boomers do. Technology is a part of this generation's life and they don't retreat to use technology as a tool in office environment. Information is a value for them and Generation X finds technology as a necessity for accessibility (Silver, 2009).

By considering Generation X from overall characteristics, this generation has brought distinct features into the office environment when it is compared with Traditionalists and Baby Boomers. There is a large difference in the way that this generation looks at the world, and therefore the office environment. Consequently, with the entrance of this generation in the office environment, a challenge has begun between generations about their adaptation to each other and accordance of their working habit's in the shared office environment.

2.3.4 Generation Y

This latest generation is born into technology and they have never known a world without technology. They have a very different way and understanding of living and working and this is affecting and shaping office environments (Lanchester, 2004). Even though, this generation is new as a workforce they were %33 of the workforce in 2006 (Caldwell, 2006).

This generation grew up with developing technology and adapted themselves into change as technology did into life styles. People of this generation lived their lives depending on the information technology without any distrust (Duffy & Tanis, 1993). On the other hand, older

generations are dealing with adaptation problems not only because of the changing office environments and the new understanding of work but also the changing technology that has caused these.

Nevertheless, Generation Y's working habits and attitudes, which they had since the days of school, have an impact on the way of working in today's knowledge era where almost everything is built upon information and information technologies. Information is also another necessity that this generation grew into. The most influential feature of this generation is their preferences about the way they work. Hence the office environment has been influenced by these preferences, this generation seeks to cooperate, communicate, collaborate, consult and to be consulted for information at any time; therefore expect the environment to be supportive of these preferences (Lee, 2007). In addition, in comparison with earlier generation, the privacy issue is no longer in question, because Generation Y has the quality to focus and do their individual work in crowded spaces.

With all these outstanding characteristics in mind, this generation is also mentioned as 'back to the future' generation; because their attitudes towards authority and traditional values of life resembles Traditionalists when compared to Generation X (Becker, 2009). In addition, when compared to Generation X, this generation takes the life and work balance one step further and integrates life in office environment (Lee, 2007). Although this generation also has the characteristics that are out of the ordinary just as Generation X, in relation to Traditionalists and Baby Boomers, their resemblances to the past and the adoption of/adaptation to the earlier generations to the current situation diminishes the challenging image of this generation (Becker, 2009).

There is one shortcoming about this generation for today; some information about the characteristics of this generation is based on assumptions because the generation still has members that are at the age of 10 and they have more than ten years for being a part of the workforce (Notter, 2002). As Becker (2009) emphasizes, it is certain that

technology influences the characteristics of Generation Y; yet, the experts, who study on generations, expect this generation to be optimistic and excited about work. As this generation grew up in age and increase by numbers in job market, the characteristics will be set more clearly.

CHAPTER 3

HISTORICAL OVERVIEW OF OFFICE ENVIRONMENTS FROM GENERATIONAL PERSPECTIVE

Working has been the most dominant part of human life since the Middle Ages as the earliest recorded instances of offices appear in the period of 5th century to early 16th century (Greenhalgh, 2002) and it is still a huge part of daily life.

However, the work and the environment it takes place in, have gone through a process of change, evolution. During this process, workforce has also changed. As the dominance of generation shifted, the work has been transformed and it got affected by the attitudes and values of the generations which eventually caused the changes in office environments and their design as a side effect.

The characteristics of generations are part of the influence in this transformation process of office environments along with major effects like economy. Nevertheless, the change in the unusual characteristics of newer generations in relation to earlier ones can be tracked from the diminishing physical blocks that are cleared from an open area for communication and interaction in between employees and employers in order to obtain optimum performance (Galitz, 1984).

The following section will present contributions and developments on office environments that are emphasized as the milestones of the evolution process of office environment. Although these advancements on office environments have occurred at the time of certain generations, most of these new approaches were achieved by the contributors' foresights based on the idea of how the upcoming generation would prefer to work.

3.1 Early Years of Offices

Early businesses were owned by families and carried on by family members called merchants, and merchants were assisted by clerks. By the early 19th century, almost all businesses of merchants were local or at most regional and operated according to the locally oriented economy. Businesses were inherited through generations performing the job of importing, exporting, finance and sales by one person; business owner merchants ("From Carbons to Computers", 1998). As they grew up experiencing the working environment of their elders, the roots of the working habits of traditionalist have shown its traces back to this date. The conservative attitude towards organizations, like loyalty, dedication to work and organization, building information upon experience without any support from any source except the written articles and books, long term career plans and job stability, were built during this period (Lanchester, 2004; "Tips to Improve Interaction Among the Generations", 2009; Becker, 2009).

With the development of transportation by Industrial Revolution, railroads were constructed and especially in the continent of America, in order to run the business of transportation regularly, the railroad became a large service organization with a hierarchy of managers for the first time in the history. By the end of 19th century, this new way of working brought forth the success of railroads administrative organization and it became an example for other businesses that are part of this enlarged nationwide economy and this expansion affected the economy itself and stated as a milestone that led to the birth of the modern office around 1850s. Traditionalists, who were characterized by today's point of view, had started to work around this time and adopted their values and attitudes from this structure of hierarchy. This generation was working slightly different than their parents and rather than one person doing each job required by the business, this generation was hired just to perform a specialized duty.

Consequently, office design developed and it is valued by the initial interest of professionals like architects and furniture manufacturers. This special and new attention brought a perspective that considers offices as an environment. As seen in Figure 3.1, which is one of the first examples of the 'concept' of office, traditionalist is placed in separate enclosed rooms according to the hierarchy and the specification of the job that they do.



Figure 3.1: The first developed office layout: Wainwright Building; St. Louis; 1890-91; Architect, Louis Sullivan ("A Caruso St. John Site", 2009)

3.2 Management Effect

By the late 19th century, Frederick Winslow Taylor, who was an American mechanical engineer, worked on efficiency of an industrial organization aiming to improve industrial efficiency in production. Taylor developed management techniques supporting his ideas using scientific facts. These techniques were learned and adopted by factory managers and this way, they were able to save money and increase productivity by

standardization. These techniques were used later by Henry Ford in 1940s as the base of the ideas for Fordism; the system of mass production and consumption.

On the principles of *division of labor* and *standardization*, Taylor sought out a decreased human interaction and structured control system for employees' performance (Littler, 1978). This collection of ideas on management was called Taylorism, scientific management, and it became a success in production industry of early 20th century in terms of efficiency.

The Figure 3.2 below is a standing out example which perfectly features the Taylor effect. The desks are placed according to the operation and just as available as the managers can control the whole environment by their own desk placed to the head of the entire employee group. Slightly different from the previous example, standardization effect shows itself in the way that not only the office furniture is planned and placed but also the way the building is designed.

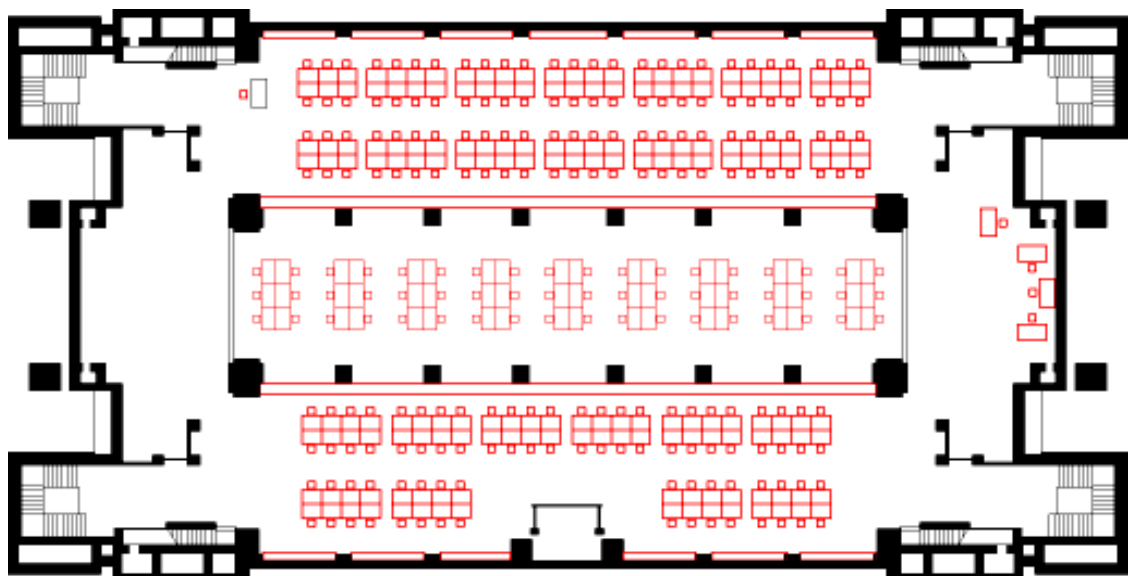


Figure 3.2: Taylorist Impact: Larkin Administration Building; Buffalo, NY; 1903-05: Architect, Frank Lloyd Wright ("A Caruso St. John Site", 2009)

As Littler (1978) points out, standardization, which was the fundamental aspect of Taylorism, was also adopted in the office environment. Standardized interior and furniture came into office space in the form of row of identical desks (bullpens), large and plain office spaces and small number of private offices for upper management. This application was planned for preventing employee interaction and any personal involvement in tasks. Managers' planned special duties were to monitor the communication in between employees and to keep it under control and this control point dislocated the individual employee from the rest of the office environment (Schmidt and Dorsey, 1986).

This approach has shaped the strict point of view of traditionalist towards work and how it should be done in a structural way; 'command and control'. As this generation is the most evolution exposed generation, they got to work in every different way possible and as well as affecting the evolution of office environments as a resistant force; this generation has expanded their borders of characteristic according to the change.

Early design layouts of offices had no difference compared to medium of a home according to the basic needs of a merchant (Figure 3.3 & 3.4) (Greenhalgh, 2002). With the contributions of the scientific knowledge, the office as in the form of how it is known today in terms of open space started to evolve as an outcome of industrialization. The first step came with the proven success of Taylorism in production and later by its adoption in workplaces. The clerks that were assisting every kind of job were now separated into different jobs, and merchants took their places as managers.

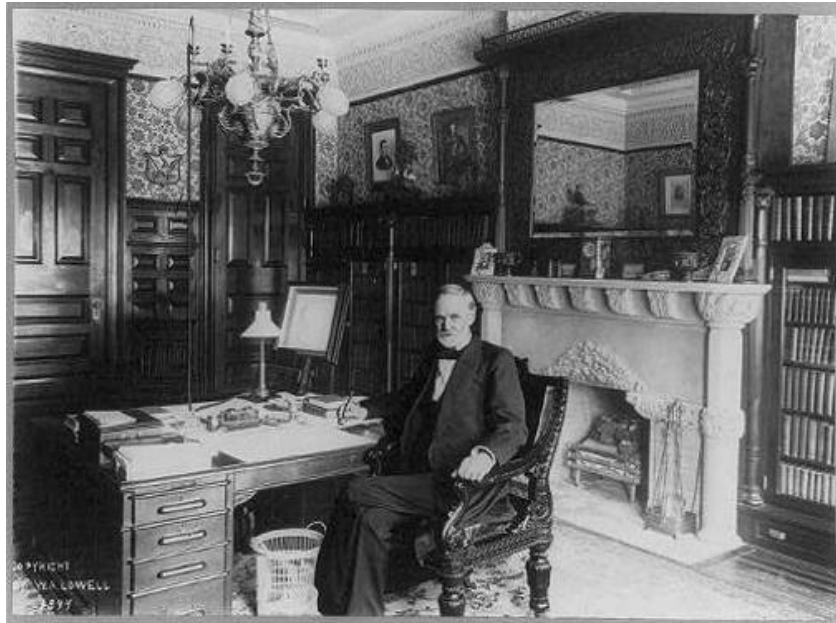


Figure 3.3: Early Office Environment of US Government in 1894 ("Early Office Museum", 2009)



Figure 3.4: Typical office setting in the late '40s ("From Carbons to Computers", 1998)

Consequently, although scientific management was an efficient method to work with, in terms of productivity, it became an unsuccessful method of effective work for offices. In the late 20th century, because of this

negative aspect, ideology of Taylorism was seen as a failure and this collapsed approach of Frederick Taylor constituted stressful and troublesome office work and factory production for the employee.

3.3 Emergence of Open Office Environments

During World War II, due to the increased demands for consumer goods, the wage of factory jobs increased to the point where it became higher than the wages of office jobs. Working in the factory and being a part of production was preferred over office jobs. Because of this instable state in terms of wages and attraction points, office work and environment was in a need to be set in order and became more inviting. In order to achieve this, scientific management was modified to make jobs less routine and the office environment began to change accordingly. Basically, humanitarian values started to be effective in office environment. Being employed in an office rather than in a factory was described as 'friendly' environments where people would yearn to work in ("From Carbons to Computers", 1998). So the need for workplaces as an environment has been recognized and the first step toward the open office concept was taken. The humanitarian style of management served the purpose; and as the status of office employees have changed, the company loyalty and efficiency increased.

As the initiative of Frederick Taylor carried the enclosed workplaces to an open space for the first time, the organization and the employees tried to be supportive of each other in order to carry on the business successfully. However, due to the understanding of management of the time, the organization and the employee had a troublesome process of adaptation. The improvements triggered by humanization were trying to advance the work space and the organization itself was in need to be developed according to the change in nature of work. Greenhalgh (2002) defines this state of being broken off as "there has been a disconnection between the workspace and the way that business works at large" (unpaged).

The improvements in office environment layouts in every phase aimed to diminish this disconnection. This fatigue even continued to be present, less effective than it was, when the open office concept was actually applied. For the change to happen, the corner stones of the office; people, work, organizational culture and space needed to be in the right place and needed to talk the right language (Greenhalgh, 2002). Workplace then consciously served as a tool that could be designed and interconnected the organization as a whole.



Figure 3.5: A view from Johnson Wax building in Wisconsin, USA
("Johnson Wax Building", 2009)

In the late 1930s, one of the leading contributions of workplace progress came from Frank Lloyd Wright, who is a famous American architect and an interior designer. During the time of economic crisis during World War II, he was one of the first to apply a humane perspective in an office. With his work in Johnson Wax building in Wisconsin, USA in 1939 (Figures 3.5 & 3.6), he bridged the gap between the conventional office

and the next development in office landscaping by integrating furniture into the workplace scarcely after his first progressive office design in 1904 of Larkin Soap Company in New York, USA by associating new architecture with futuristic way of management (Greenhalgh, 2002).

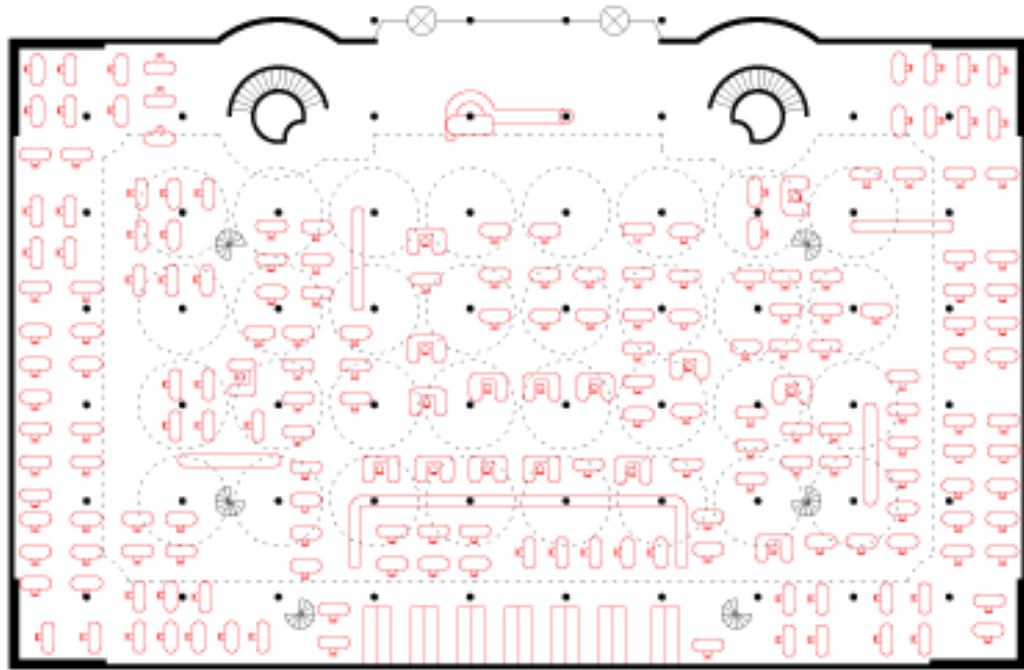


Figure 3.6: Johnson Wax Administration Building; Wisconsin, USA; 1937-39; Architect, Frank Lloyd Wright ("A Caruso St. John Site", 2009)

Wright, as one of the first contributors to office design, intended to construct the bond between architecture and public in office areas by using modular and standard furniture and space which was shaped by corporate culture. He also stood out with material use and organic forms of streamline movement which he used in his design to establish spaces divisions, considering the offices at his time.

In 1958, a group of management consultants, Quickborner Team who are still in the office furniture sector as a manufacturer, became aware of the fact that the way the employees have been working, the way they were placed and positioned had a harmful effect on work performance and they improved the settlement in workplace, which had already scattered

around a large open space, by their approach known as 'Burolandschaft', office landscape (Brand, 2005a & 2005b). These consultants analyzed the flow of work in open areas and searched for the efficient and effective ways of the cycle of information in means of input and output rather than just positioning tables in a sequential way or scattering them around without referencing any organizational purposes. With the integration of socialist values of 1950s, they applied scientific knowledge to office design. The example of Osram Offices designed by this approach seeks out solutions to the impractical way of positioning, disabled communication and the strongly defined physical status indicators which were the fundamental properties of offices that triggered Burolandschaft study (Figure 3.7 & 3.8). By having the purpose of improving these physical qualities by design, they have been a source of inspiration while exploring the unseen opportunities of a workplace.



Figure 3.7: Osram Office Building designed by Burolandschaft in 1963; Munich, Germany ("A Caruso St. John Site", 2009)

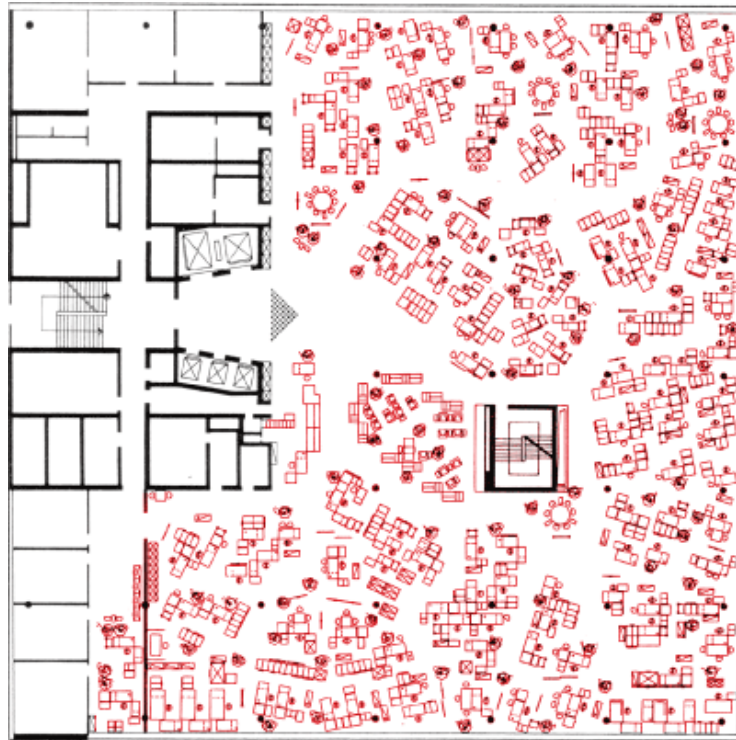


Figure 3.8: The Plan of Osram Offices ("A Caruso St. John Site", 2009)

A common ground spotted among work functions and office spaces was reflected through space division again but with a radical departure from the physical barriers of the traditional offices which blocked the communication. With the scientific contributions of 'Burolandschaft', the office space was decorated with plants, floors were covered with carpets, interior walls did not exist.

In their ideal implementation, sustainability, which is a very popular subject in every area today, has appeared in office environment for the first time in the form of 'ecologically inspired settings'. In these landscaped offices, the areas were separated organically and the element of nature, like plants, were part of the environment of which its employees were expected to be active and have personal control of the environment and interact with it (Brand, 2005c).

3.4 Popularity of Humanitarian Values

During 1950s to 70s, Herman Miller Inc., probably the most famous office furniture production companies of the world had a CEO called Max De Pree who was the son of the company founder D. J. De Pree. Max De Pree is perhaps best known for his work as the CEO of Herman Miller Inc. with his idea of 'supervisionless' organizational culture. He implied his unusual humanitarian idea into the organizational culture that was later built by the office furniture manufacturing company of Herman Miller Company. This idea was about the understanding of bureaucracy that was preventing the fun and the cheerful company spirit and therefore he was defending that supervision was an unnecessary element for the future office environment which clearly shows that he was a far-sighted administrator (Meet Max De Pree, 2009). He as a traditionalist had successfully predicted the perfect environment that the up coming generation would prefer. Even though it is unusual for his time, this idea has contributed to and has directed the design of office environments.

Herman Miller Company, at De Pree's time, instituted the Scanlon Plan, a program that took initial steps towards the cubical revolution and revolution in management with the active employee incorporation. In 1968, Herman Miller created a product based on the new philosophy inspired by Quickborner Team. This product was based on the studies of the designer, Robert Propst who broke down the individual need of employees. The first modular business furniture system, 'Action' known as cubicle, was created and introduced to the furniture sector. This system aimed to replace bullpen and valued what the actual users of furniture, employees, needed and required. As a result, furniture for offices with open planning was standardized over again according to this point of view and the sea of cubicles was born by 1980 as seen in the plan of an office environment in Figure 3.9.



Figure 3.9: A Plan of Sea of Cubicles (Lisberger and Macbird, 1982)

The Action Office was a flexible system that consisted of components that could be rearranged for different setting for different occupations. The major element was the fixed acoustic panel which was discovered for the first time and used as a bonding unit in this modular furniture (Brand J., 2005a). Yet again, the employee had an active role in this environment of Action Office and was enthused to discover the perfect way to perform and produce hand in hand with the furniture inside of the acoustic panels forming cubicles (Franz, 2008).

At that time of 1960s and 1970s, 'cybernetics' idea of the office was discussed on architecture textbooks and journals (Franz, 2008). 'Cybernetics' originally comes from a Greek word meaning 'the art of steering' and is about "having a goal and taking action to achieve that goal" ("Guide to Cybernetics", 2009) and it is used in the discipline of computer technology mostly on artificial intelligence; but for the office definition it is seen as 'being able to free the ideas that are produced by productive parts of the organization' whereby this new furniture system as Franz defined (2008). The cubicle furniture use suited the definition and precisely diminished walls of traditional offices. In the early 1970s, cubicles became popular in the market and reached its peak in 1974 by the 20 percent enclosure in the market; and the main logic behind the

popularity laid in way to communicate and flow of information through interaction even though technology was not fully developed and integrated in offices in forms of computer and internet (Franz, 2008).

Franz (2008) also mentions a group of American writers, who are focused on popular management, advocating that the organizational culture values would rule over policies and procedures by the developments that are taking place in offices, initially starting with cubicles; as the bureaucracy fades, creative thinking and collaborative working will shape the workplace and it's surrounding. These writers suggested a new era by this argument, just as Max De Pree dreamed and aimed during 1960s.

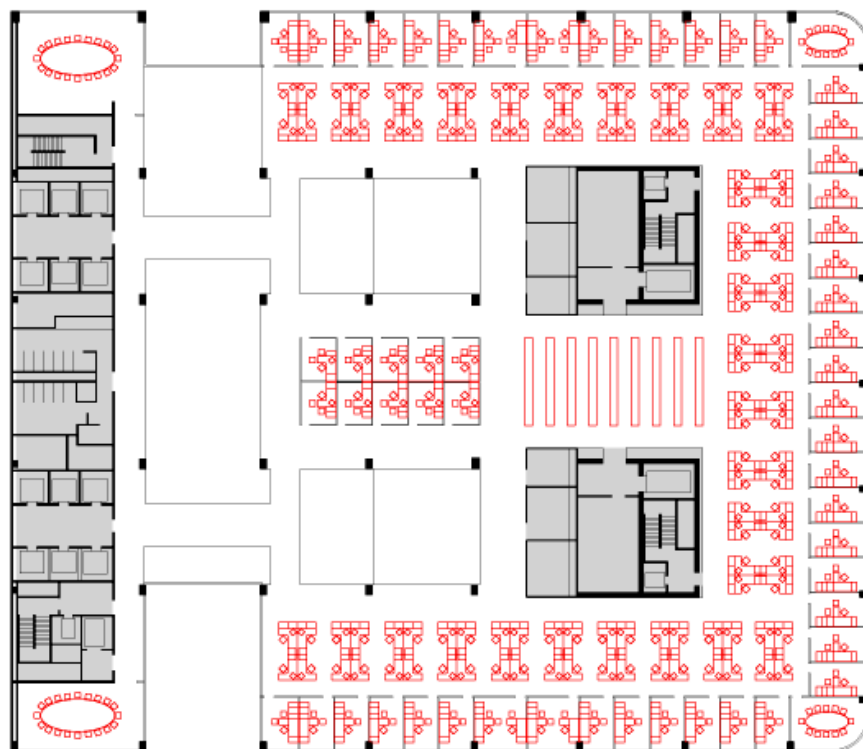


Figure 3.10: Citibank Headquarters; 1996-2000: Architecture, Foster and Partners ("A Caruso St. John Site", 2009)

Yet again, the perceived success of cubicles did not last long. The economic crises in the 1980s led the increase in real estate costs and managers oriented to use the most out of an open area. The cubicles

were jammed into smaller areas with more employees with a repetitive and identical image (Figure 3.10). This method became so profitable that the number of cubicled offices exponentially grew in 1980s (Franz D., 2008). However, being blinded by more profitable workplaces, the fundamentals of the ideal office environments were left out causing the dismissal of personal flexibility and control in the environment and the hegemony of centralized planning and control of management (Brand J., 2005b).

As Franz (2008) states, "the utopian visions of the cubicle have been crushed by reality" (unpaged). The real life facts of organizational priorities have destroyed the theory of ideal office environment of open office concept composed of cubicles. This indirect self destruction led and contributed to new amenities for self management, cooperation and collaboration for the later development in offices.

The concept of cubicles was born for the cost efficient and work effective environment, however being efficient won over being effective by the decision of employers in benefit of a profitable organization. The concept that hit the road on the values of humanity was not so popular after all. Generation X as well as Baby Boomers has experienced cubicles and influenced the change by their humanitarian values.

By the late 1980s, office furniture systems developed more and became advanced along with enabled technology. Computers superseded their permanent location in offices as a standard product along with the photocopy machine, telephone, and so on. The way to communicate has taken a new path different from the traditional understanding of work and this has shaped the new nature of work along with the new work environment. Information and knowledge became more attainable with the continuous innovations in technology over the last decade and working has started to take place in a global economy (Barber et al., 2005).

According to changes taking place in the light of technology, again with humane action, the panels of cubicles were first lowered and then even came down lower for the purpose of information sharing; communication and collaboration (Figure 3.11). The furniture in the cubicles became scattered around the place according to the functionality instead of the stressful and controlling cockpit like shape of cubicles. And the open office concept, returning to its origins, was reborn from the evolution of the understanding that underlied in the cubicles.



Figure 3.11: An example of transformed cubicles
("Used Cubicles Have Benefits", 2009)

Employee satisfaction improved drastically by the change in cubicles and the turnover to the organizational performance was recovered by the reinforcement of the office environment at the end of this process of improvement and development of office environments just as the upcoming generations of Generation X and Generation Y prefer. The employees were influenced in many positive ways which caused them to be more productive, creative and effective.

In today's society, people are more conscious about their preferences and requirements from life, hence 'people first' concept related to human centered design is a pursued approach by designers as well as manufacturers ("Analysis of modern office furniture design features", 2009). Subsequently, office environment design got its share from this trend as well.

According to the conditions of today's global economy, even though the work is being done during specific office hours, it continues on 24/7. The economy is feeding itself with ongoing information exchange and when considered globally, there is no time and place specific to perform the job. For this reason, employers have an unlimited demand on employees and not just ordinary ones. Qualified and talented employees regardless of generation are needed and they are the ones valued in current business world. Therefore, there is a considerable intention to retain these hardworking and smart employees in order to acquire and maintain a company's intellectual wealth by constituting adequate working spaces required by the employees of knowledge era.

In order to relate the generational facts with office environments of today, next chapter will discuss the new approaches in work and work environments, aroused with the dominance of Generation Y; and the strategies towards multi-generational design in detail in order to draw conclusions on multi-generational influences on the assets of office environments.

CHAPTER 4

NEW WORK AND NEW OFFICE ENVIRONMENTS

Diversity in office environments has been open for discussion for a long time. The ability of an organization to deal with the diversity in office environment has the potential to bring power and success to that organization. Notter (2002) states that there are discussions on the diversity in office environment in United States on the topics of gender, race, ethnicity, disability; differences are seen as an advantage that challenges organizations for an effective environment.

Generational diversity is a new subject that was not included in typical diversity in office environments (Notter, 2002), especially the matter of its reflections on design.

From past to recent history, the four generations that have been analyzed in previous sections have lived their time of dominance in office environments and affected the way their design have shaped as well as get affected from the pioneer approaches of architects, consultants, office furniture manufacturers, and so on. This mutual relationship has not only shaped the way the office environment is today, but also the several characteristics of generations; their working preferences.

Today is the time of Generation Y. Their dominance in office environment is leading to series of changes on work and therefore, work environment. Although the other generations are still present in the environment, these changes are influencing the way the office environment is designed. Organizations are venturing the challenges in between generations on their different preferences and transforming these challenges into advantages as knowledge economy requires. Hence, multi-generation is

being started to be used as a design consideration for an effective and more productive environment to the benefit of the organization.

Originally created ideas, expertise on occupation and possessed information by employees are the entities that lead organizations to the peak level of their success in knowledge era (Gensler, 2008).

Peter Drucker, a famous management expert, defines employee of this new era as "knowledge employee who develops and applies knowledge and information in workplace and knowledge work requires a high level of cognitive involvement as well as analytical and judgment skills" and it is also a composite of individual and collective modes of working (Gensler, 2008, p.6); and Brand (2005d), a cognitive psychologist, supports Drucker by emphasizing that this new way of working is triggered and diffused in by the technology and the Internet. Especially with wireless technology, the way of work and employee became more independent in and out of the office and gained a free state (Greenhalgh, 2002).

Generation Y was born into this knowledge era and grew up as knowledge workers, right after Generation X has prepared the background.

Nowadays, Generation Y is the dominant generation in workforce. Therefore, this generation's lifelong experiences and life style are influencing the way that the office environments are. Therefore, as schematized in figure 4.1, when traditional work environments have been transformed from hierarchical structure to a flat and network structure, the technology has been integrated into environment from product level to communicational level and the fixed workplaces have been evolved to business clubs; it would be better if each generations preferences and requirements are taken into consideration for these new approaches to be supportive of all levels of the workforce as well as the organizations itself.

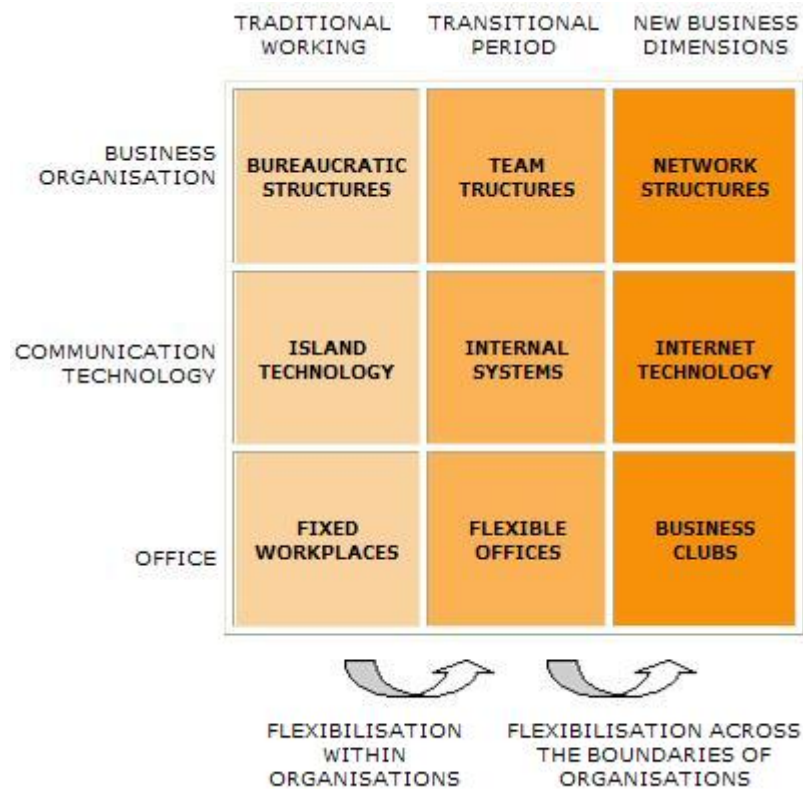


Figure 4.1: New Business Dimensions ("Old Models, Are They Still Satisfactory?", 2009)

The following section utters the new way of working and its reflections upon office environment according to requirements of the dominant generation, Generation Y.

4.1 New Work

In modern office environments, the necessities of the changing nature of work became indispensable requirements for the organizations; the contributing factors for communication, in means of collaboration and interaction among employees, and for team work. The spaces are supportive of informal associations as well as formal ones. The way that office environments are designed facilitates knowledge management and therefore information flow in means of exchange, learn or share together with promoting productivity (Tobin, 2004). As Haworth Company, which

is an office furniture manufacturing and office design consultation company, defines as follows;

The modern work environment is designed to accommodate a fast, flexible pace, to integrate an increasingly complex level of technology, to keep employees engaged and to enable collaboration. ("Maintaining Productive Privacy in an Open Workplace", 2006, p.1).

According to Bauer and Kern (2002), the office environment is defined by the coordinates of time, place and structure and constantly changing modern information and communication technology which are the necessities of knowledge economy (Figure 4.2); and they visualize the possibilities of an office environment within these coordinates and even are able to represent the drastic change that slowly took place in time by the characteristics of generations and clearly emphasize the transformation of spaces of work as well as the work itself by stating that "... many people no longer speak of their office but more and more often of their workplaces..." (p.29).

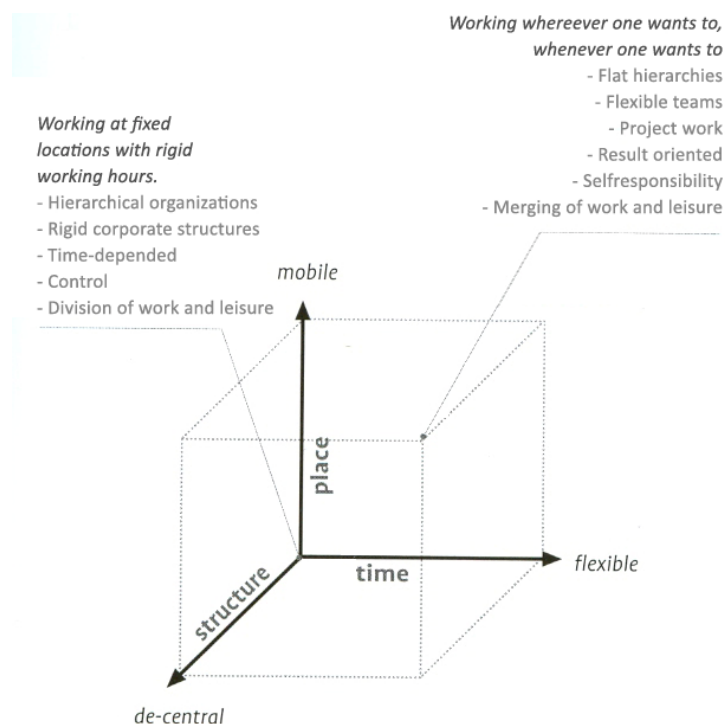


Figure 4.2: Three dimensional representation of office work (Bauer, Kern, 2002, p. 29)

As mentioned earlier, today's workforce of knowledge economy, advanced level of consciousness about what it wants and requires from an office environment, hence the design, therefore the quality of office environment is a decision influencing factor for employees while choosing in between jobs. They are in search of a comfortable place that enables and supports them to be productive (ASID, 1998). Especially Generation X and Y, had strong humanitarian objectives when talking about the office environment. This attitude led organizations towards recognizing the values of the workforce on office environments and efforts of organizations targeted for a better office environment where employees can be creative and productive. Thus, how they feel and what they value are taken into consideration and studied.

Being accessible and being accessed, having personal space with minimized distraction and providing flexibility and customization are the desirable features from an office environment that multi-generational workforce requires within an adequate level for each generation.

The importance of sharing, transfer of and learning of any kind of information either via an electronic mail, on a network, printed material or just by a conversation and the need to communicate is conspicuous preferences of Generation Y. To be trapped between walls or to be disconnected from the rest of the office by any distance causes a frustration and directly affected this generation's productivity negatively (ASID, 1998).

Brennan, et al. had conducted a longitudinal field study where they looked for ideas on open offices versus traditional offices in 2002. This study was carried out on employees of a certain company who have just been relocated from traditional offices to open offices. In their study, they compared the shared values of traditional offices and open offices, and searched for clues which might have cause the struggle from transformation of offices. This study is one of noteworthy work among other studies done in 1970s and 80s that emphasizes the variety in preferences of different generation and their adaptation and reaction

levels are analyzed. It reports positive outcomes such as increased communication among co-employees, higher judgments of aesthetic value and more group sociability, whereas negative findings such as decreased performance, lower judgments of functional efficiency, lower levels of psychological privacy, environmental dissatisfaction, fewer friendship opportunities, supervisor feedback, privacy, noise, disturbances and distractions and increased feelings of crowding (Brennan, et al., 2002). This study exemplifies the surviving chaos of the state of dissonance of earlier generations and their perspectives on recent office environments of 2000s.

Furthermore, being accessible is another necessity for information sharing and decision making for Generation Y. This generation prefers to work with a co-employee rather than working alone as preferred in the past. The effectiveness of learning from an experienced co-employee and creating more advanced and in place solutions as a result of brainstorming during a team work, makes collaboration desirable through all kinds of communication. Therefore, according to Generation Y, office environments require meeting areas and team work spaces as well as socializing spaces, common areas to support information flow in between employees in an optimum level where different generations could come together in purpose of work or social life. As schematized in figure 4.3, this latest generation has a wide range of work modes depending on the preferred level of two aspects; flexibility and interaction.

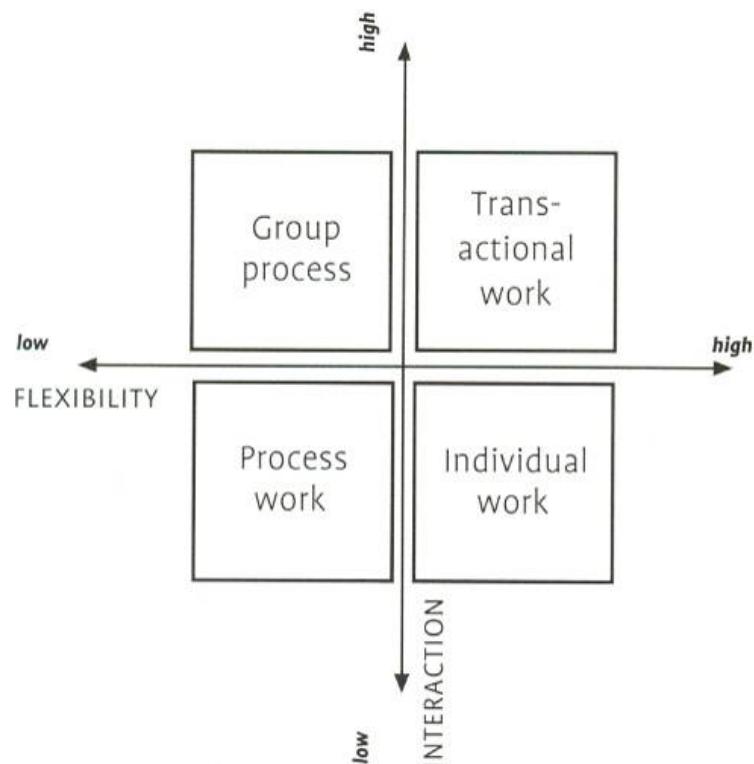


Figure 4.3: Modes of work (Arnold, Klauck, 2002, p. 85)

Findings of a research conducted by MIT show that employees of today's environments who consist of approximately 33% of Generation Y, are five times more prone to ask a co-employee for information rather than doing their individual search by using other sources and spend less time in their individual desks which indicate the drastic change in the perspectives on employees who are now knowledge workers. Hence, the organizations of current economy are supporting this situation because of the qualitative outcomes for their businesses; 'Knowledge creation' (Gensler, 2008; Wymer, 2008).

In the Gensler report of 2008, it is stated that the innovative solutions as an outcome of effective collaboration comes with more frequent information sharing and triggering creativity. Innovation in this knowledge economy is valued, therefore 'collective intelligence' is seen as the gate for a successful business and office environments are stated as

being the initiator for effective collaboration by being free and open space enabling visual connection between employees (Gensler, 2008).

Collaboration while working has proven as it strengthens the relationships among employees and in time, builds a trust circle which then returns to the business as efficiency drawing effectiveness. This situation also enables Traditionalists to come out of their shell and to interact, and to share common information with the other generations. Consequently, even though the preferences of the latest dominant generation of Generation Y was challenging for earlier generations, it has started to be accepted by the majority of the workforce.

According to Greenhalgh (2002), under the influence of technology, the office environment is expanding to outside its physical territories. An individual work desk is not the only place for the employee to get the job done. The spaces breaded out of the change in nature of work serves as independent workplaces scattered around offices enabling flexible work styles like individual work, team work and social communication. The employee became independent of a desk and is free to work wherever he/she feels like the work performance is at its most. Even though, earlier generations are held back about this approach, as seeing its organizational success, they have started to enjoy the opportunities within their limits.

With the possibilities of wireless technology, the independence has been carried a step further and *mobile worker* concept appeared in the meaning of balancing work and daily life; using work talents anywhere and any time possible. Companies, who are conscious of the global widening, started to espouse mobile work (Venezia, 2007). According to the Nemertes Research reported in the work of Venezia, the 43 % of global organizations are now applying mobile working in addition to the existing office works and 26 % of them are in the phase of developing the mobile strategy. These employees are responsible for accomplishing their tasks wherever they impose their daily life even in their individual time (Venezia).

Home office concept was also initialized with the support of information and communication technologies, first in interest of women then spread out more by the mobility issue ("The Home Office Concept", 2008). People work in their offices either through running their entire businesses at home or splitting the time they spend for work between home and work. This way of working is again a beneficial way for the organization to operate and in the advantage of the employee providing the freedom and independence while conducting their work.

Although thought of working outside of an office environment makes earlier generations uncomfortable, there is a predicted growth in the number of mobile workers due to the preferences of new generations (On the Move, 2007). With this trend, organizations expect to have more cost profitable office spaces and this disengaged style of working is more effective for the employee and productive for the organization which is also mentioned as 'hotelling' in several sources in the literature (On the Move, 2007; Venezia, 2007; Buckley, 2007).

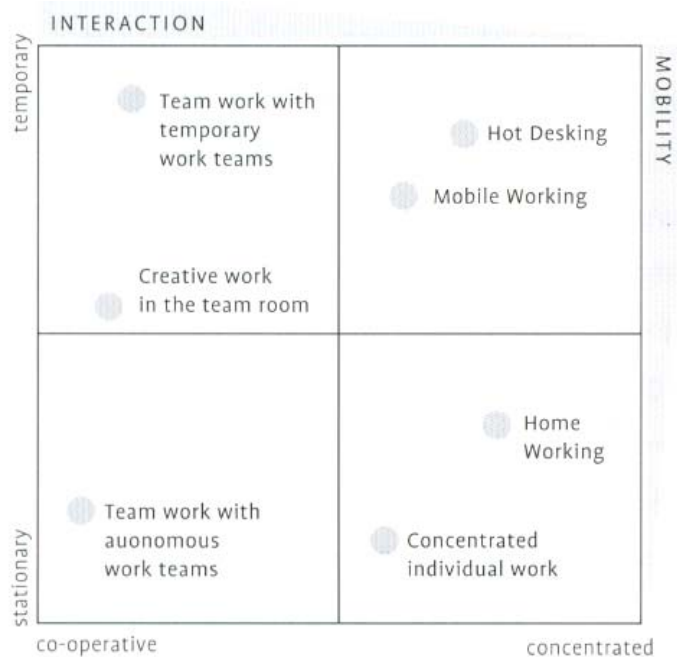


Figure 4.4: Modes of working in relation to mobility and interaction (Bauer, Kern, 2002, p. 30)

Mobile workers are leasured to choose the places they would like to work either in a very private place or in the center of a crowded communication place and they are in control of managing their own time. As schematized in figure 4.4, the combination of preferred level of mobility and interaction defines a different mode of work in relation to quality of space that the work is done in. Concentrated individual work is eventuated in stationary and concentrated spaces; whereas creative work in the team room takes place in more communicative and less stationary areas. And mobile workers prefer to work in concentrated areas but temporary spaces where they can decide and leave if they want.

The latest generation and upcoming generation may carry on working as mobile workers, however, as long as traditional values towards office environments are preserved, this trend will not become a widespread perspective on work.

4.2 New Work Environment

Results of the literature review study show that the spaces in office environments can be categorized into four regarding the workplace values and preferences of knowledge workers. DEGW, a leading firm of space planners built upon the formation of Dr. Francis Duffy, claimed these categories of space types for the first time as Hive, Den, Cell and Club; hence, has been an inspiration for similar companies working on the subject of space separations in office environments as well as their studies related on this subject (DEGW, 2009; Duffy, 1997).

DEGW states the four type of space in office environments from the perspective of the relation between office design and organization structure in 1996. As seen in Figure 4.5, similar to the work of Bauer and Kern (2002), the spaces are defined by the level of interaction and the level of autonomy which is evaluated by flexibility. In each of the spaces, specific type of work mentioned in the previous section, are eventuated

and the spaces meet the requirement of these different works. Accordingly, DEGW sets out its perspective as;

The “Hive” takes its name from the workplace arrangement and the functions within it. Here, we find primarily standardized clerical work being carried out by individuals.

The term “Den” is supposed to convey the idea of a busy place that fosters group processes and interactive team work.

The “Cell” type designates a monastery or convent with cells in which the individual can work in a concentrated fashion,

and the term “Club” is intended to draw on the image of the traditional gentlemen’s club, a place for communication. (p.83)

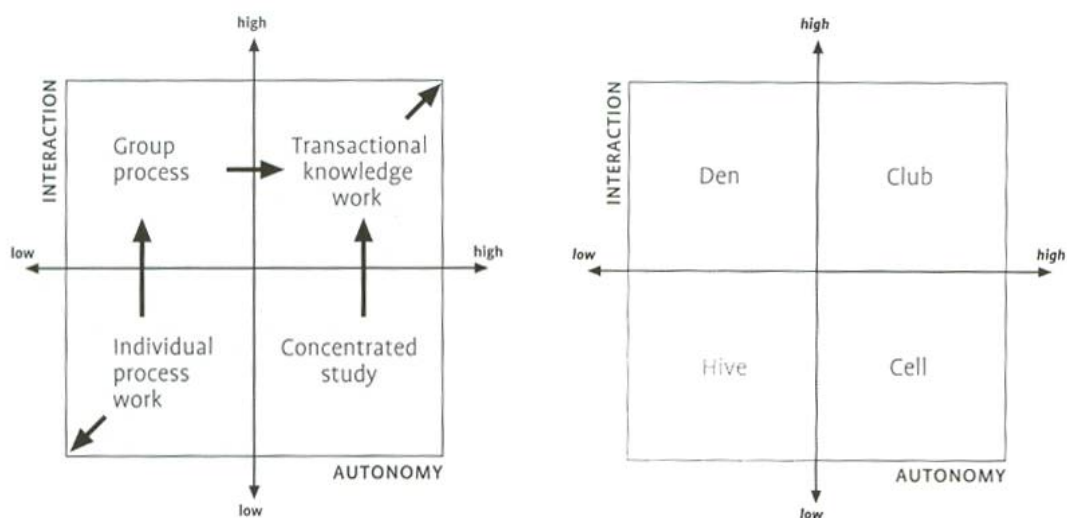


Figure 4.5: Patterns of work according to DEGW new developments in working (Arnold, Klauck, 2002, p. 85)

Accordingly Steelcase Inc., which is an office manufacturing company, has divided these demanding spaces according to the number of employees cooperating as:

‘I’ – a person,

'you & me' two people,

'we' - 3 to 6 people and

'WE' – 6 to more people ("Working in Four Part Harmony", 2007).

Gensler Workplace Survey (2008) assorted spaces according to the recent way that the work is accomplished as:

'Focus',

'Collaborate',

'Learn' and

'Socialize' (p.5).

And Knoll Inc. mentions these spaces 'magnet spaces' and assortments as:

'impromptu open plan team space',

'think space',

'strategy room' and

'communication space' (Wymer, 2008, p.1).

Although each generation has different preferences toward working, in today's office environments, these spaces are indispensable because they are constructed on the primary needs of employees such as eventuating individual work, meeting with co-employees for decision making and problem solving issues with collaboration and gathering up in office environment to keep the flow of organizational work by communication; except having the social life as interaction spaces.

According to the results of a poll in America conducted by the National Sleep Foundation in 2001, people are spending less time for sleeping and the quality of this sleep is becoming ruined; because of the long and exhausting hours of work and the daily time which is spent in home environments and in socializing places has started to diminish (Soares, 2001). As a result, Generation Y reacts this decreasing time of daily life by having the integration requirement of these socializing places

which Ray Oldenburg, who is an urban sociologist, defines as *3rd place*; a medium to socialize and utilize experiences of both house and work life ("Familiar Places in New Spaces", 2003). In other words, in order to be able to overcome the need to relax and get comfortable as well as socialize in office environments.

Google Company is one of the first organizations that integrated the 3rd place in the office environment in an unusually different way when compared to the common integrations in today's office environment. The company has interpreted the definitions of the four types of spaces of hive, den, cell and club in accordance to today's modes of work. Break rooms are evolving into café spaces, playground, even spa centers. Group spaces are replacing conference and meeting rooms. Even the separate functions with the meaning to meet are coming together in same spaces. (Figures 4.6 & 4.7)



Figure 4.6: Group and Private Space Approaches of Google Company ("Office Snapshots", 2009)



Figure 4.7: Break rooms of Google Company
("Office Snapshots", 2009)

Although, these spaces of Google Company are attracting a lot of attention and spreading energy, earlier generations of the workforce will find it hard to resemble with the environment. In accordance to their background on work habits, they will hardly be able call these environments; office. On the contrary, the latest generations of Generation X and Y will instantly adopt themselves to work in these spaces with eagerness. Consequently, multi-generations in office environments ought to be taken into serious consideration while these environments are designed especially towards the requirements of the latest generations.

4.3 Multi-Generational Design Strategies in Office Environments

Multi-generation as a design consideration has started to be a concern as the rapid advancing technology was integrated more into life as a result of upcoming generations.

The first improvements in the office environments from the perspective of multi-generational design were initialized within small scale like usability of electronic devices, the placement of handles on storage units. As technology has been fused more in office environment in all scales, the concern on the environmental qualities that affect each generation separately has ascended.

The value each generation beholds upon office environments differs and is reflected on their work ethic. In addition, motivational preferences, leadership approach, communication style as well as interaction style differs from generation to generation just as their relationship state with technology. Each generation has distinct views on organizations and sustained different levels of balance between work and life (Schwartz, 2008).

Because of the lack of consideration of multi-generation in office environments in the past, there are some studies in the literature on the differences between generations as workforce. The main subjects are generational challenges in workplace and strategies proposed for the creation of an office environment that supports and integrates the needs of multi-generations (Olmstead, Avila, 2009).

In order to be precise, assimilating the diversity in office environments by understanding why people resist changing and acknowledging of each generation's strength is crucial while designing each generation. As the comfort level of each generation is increased physically and mentally, the performance of the workforce will improve drastically (Olmstead, Avila, 2009).

Notter (2002) has examined the challenges between generations in three issues; "awareness, communication, and the ability to manage conflict productively" (p.7) and has put forward strategies in order to overcome them and transform them into the benefit of the organization. Notter sustains that differences of awareness among the generations will trigger productivity of the workforce by building work interactions based on the

benefit of all types of generations, hence the organization will behold a more balanced structure within. According to the author, the orientation and effectiveness of each generation can be controlled by adequate communication strategies. By this way, the generation will get a chance to explore each other as well as clearing out the assumptions and bias related with work.

Consequently, Notter (2002) concludes his ideas by emphasizing that organizations are entitled to manage the diversity and have an appropriate attitude towards the collision of multi-generation in workplaces and use workplace diversity as strength.

There are some opinions on strategies of how to embrace all generations as target user group from different sectors. Cosmetics sector is all about knowing the strengths of the capabilities and direct generational mix according to the separately well analyzed preferences of each generation and the general market trends (Kauf, 2003).

Education as an area of study has also special attention to multi-generational user groups. Especially the sector dealing with the educational and instructional technologies values each generation and has the purpose of shaping their products according to the characteristics of each generation (Reeves, 2006; Clarey, 2009).

Design strategies towards multi-generational workforce have slightly different applications in office environments. The intangible assets such as communication, accessibility, privacy has been matched and evaluated on the tangible assets of office environments like physical elements and the physical structure of which designer are able to influence and contribute as paired off in (Table 4.1).

Table 4.1: Relation between the intangible and tangible assets of today's office environment (adopted from Anjum, Paul Ashcroft, 2005).

Intangible Assets	Tangible Assets
<i>Mobility</i>	Furniture and its layout designed in relation to the new work patterns with required technology; from static or away modes of working to individual and group working modes like a separated space of workstations as touch down areas
<i>Flexibility</i>	Rearrangible free standing workstations that can facilitates different working styles.
<i>Simplicity</i>	Aesthetic consistency of the office environment as a whole; colors, styles overlapping with the flexible organizational structure
<i>Ergonomic suitability</i>	Adjustable furniture according to the anthropometrics and ergonomics with having the diverse structure of workforce in mind; as well as the new work types
<i>Environmental and ecological issues</i>	Adequate use of material and energy from nature
<i>Ancillary spaces</i>	Appropriate furniture such as breakout areas, places for interaction or concentration, places to socialize and relax
<i>Cultural implications</i>	Furniture and its layout designed according to the diverse ethical background of the workforce; such as improper positions like having the back of the employees toward the entrance of a space
<i>Image</i>	Expression of the organization through design of the entire environment in purpose of conveying messages of brand identity
<i>Cost implications</i>	Furniture leasing from furniture partitioning, lighting, cabling and even carpets
<i>Adequate storage</i>	Intelligent types of storage in relation to the type of new work activities, considering both electronic storage and storage of ancillary items
<i>Appearance</i>	Aesthetic aspect of furniture and their perception by employees
<i>Privacy and noise control</i>	Screens and partitions
<i>Training</i>	Correct use of furniture in terms of physical comfort

Consequently, furniture designers of office environments have more to consider not just the furniture itself but the perceived assets of office environments which are explained briefly in Table 4.1. Hence, designers have heavy responsibilities towards both the organization and the workforce. It is crucial for the designers to work in collaboration with other designers who have different expertise in relation to the other components of office environments such as sound, lightening, air quality and so on.

The product 'Resolve' is a noteworthy example that has served in the benefit of both the workforce and organization. Its every single detail is designed in relation to today's office environment aspects which is developed by the team of Herman Miller Inc. leaded by the designer Ayşe Birsel in the years of 2000s (Herman Miller, 2009) (Figure 4.8).



Figure 4.8: Resolve (Resolve, Herman Miller retrieved in 25 Oct. 2009).

Consequently, most of the worldwide known office furniture manufacturing companies mentioned earlier are expanding their area of

expertise, including different design areas into their organizations in order to keep pace with the evolving work and work environment and transforming into office design consultancy companies as well as providing the appropriate service for it as in the example of `Resolve`.

CHAPTER 5

CONCLUSION

Main purpose of this thesis study was to explore the influences of multi-generational workforce on the design assets of office environments. In order to expose the relationship between generational diversity and the factors influencing evolution of the office environment design, a three folded literature review study was conducted; (1) the four types generations which are the constituents of today's workforce; Traditionalists, Baby Boomers, Generation X and Generation Y, (2) the historical overview of office environments from a generational perspective, and (3) today's office environments and the generational balance in these environments. It is realized that the academic studies on these subjects are very limited in the related literature; especially the ones considering multi-generational influence on office design are so scarce. Hence, the subject of this thesis is mainly tracked from the sources of worldwide known office furniture manufacturing companies, and the office environment design consultancy firms by gathering their predictions about office environment design. In spite of their informal nature, depending on the existing studies of these companies, it can be said that this topic on multi generational workforce is a spreading subject on this field.

Basically, each part of the literature review study corresponds to the main and sub questions of this study. However, for the purpose of better flow of this Chapter, sub-questions revisited first and at the end, concluding remarks are stated as a corresponding answer to the main question in the following paragraphs.

- What are the characteristics of generations which are the constituents of multi-generational structure of today's workforce?

As it gets harder to stay in the game in today's highly competitive knowledge economy, organizations have directed their attention to their workforce and their performance levels. The main aim of organizations has become to support effectiveness of their employees to optimize their performance levels. Hence, the environment that work eventuated has started to be transformed by using design as a tool.

In order to use this tool appropriately, the notion of 'workforce' which has a wide range of diversity within in relation to sex, gender, race, ethnicity as well as age, has started to be studied and analyzed in basis of specific sectors and organizations. This diverse structure was proved to bring power to organizations resulted into new dimensions of performance; hence, diversity has been valued by organizations of today.

Generational diversity has been highlighted in the recent literature as a different asset because of its dynamic structure within the workforce in comparison with the other diversities. As aggregated by Schwartz (2008), each of four generations has gone through social, economic, and political influences of their time.

The 'four generation' of our workforce today have different characteristics towards work and work environment. Traditionalists, the children of World War II, are practical, hard working, highly loyal to the organization, respect authority, dedicated and used to hierarchy in an organization; and highly dependant on privacy and individual work, expect only formal communication without interaction. Whereas, Baby Boomers, the children of Post War, are optimistic, self concentrated, competitive, work-driven, workaholic who challenges authority and respect the outcomes of teamwork; however still used to traditional type of work conditions and work environments like less technology integration, more privacy and so on.

On the contrary, Generation X, the children of economic depression of early 1980s, is skeptical, distrustful and independent of authority and creative who values information and team work more; on the other hand more comfortable with individual work, possesses informal communication, cannot work without technology and work to live rather than live to work. Whereas, Generation Y, the children of technology, is optimistic, excited about work and respectful to authority, has thirst for knowledge therefore information, concerned with traditional values; yet has its own way to work.

Table 5.1: Comparison of Four Generations

	Traditionalists	Baby Boomers	Generation X	Generation Y
born in...	prior to 1946	1946-1964	1965-1980	1981-1999
shaped by...	World War II The Depression Traditional family	Cold War, Vietnam War	The energy crisis Technology's first wave Latchkey kids Rising divorce rates	Explosion of technology
value...	Respect, Loyalty, Experience	Standing out, Recognition	Flexibility, Honesty, Work-life balance	Strong leadership
are...	A disciplined, hard worker, Appreciates order and a job well done	Team player who doesn't want to be managed, Live to work	Independent, Self-reliant, Unimpressed by authority Focused on self-development, Work to live.	Self-confident, Competent, Optimistic, Out-spoken, Collaborative, Change jobs easily, if better offer
career motto is...	Seek job security	Education plus + Hard work equals; success Believe in creating a better world	Invest in portable career skills	Multi-tasking

Therefore, in order to be able to design the appropriate office environment for effectiveness in working conditions, what each generation is capable of, and what their characteristics are towards work

and work environment, should not only be taken into consideration by office designers, but also by the organizations.

- How has work and work environments changed over generations?

Parallel to what these generations have faced while growing up, similar influencers have affected the evolution processes of office environments as well. There is an indirect connection between the way that office environments have evolved and generations.

The four generations of today's workforce has its own period of time of ruling. During these periods, the dominant generation has brought its values into the office environment and hold own to them as dominancy shifted and caused struggle. Hence, this state of struggle has been challenged by the designers in purpose of constituting the appropriate environment design which is suitable for all of the generations in purpose of diminishing the struggle and optimizing work performance.

From the early offices, the way that the organizations were structured and managed shaped the work ethic and habits of Traditionalist; offices like homes, private and adequate for individual work; as these traditionalists worked as managers with Baby Boomers, in enclosed rooms again with optimum privacy they have shaped the dominant characteristic of these two generations and through the evolution process of office environments, they resisted to avoid losing privacy. Generation X, was more comfortable in open spaces that came with humanitarian approaches of architects, office furniture manufacturers and so on. Cubicles were the right office environment for this generation; open to informal communication, suitable for individual work. However, the predictions regarding the work habits of upcoming generation that is Generation Y, has transformed office environments in to optimum communication level where knowledge creation and collective intelligence espoused. The wall preventing communication came down, the layout transformed into a more flexible shape, where employees may work as

they please; focusing on individual work, making decision and solving problems with co-employees, sharing ideas in a team work or socializing.

- How does today's multi-generational workforce influence the assets of office environment design?

Organizations of today are not in a position to put employees in a building like a plain box and expect to profit from their performances in that environment. Diversity within workforce, which is in need of support in an environmental level by design, is appreciated in relation to its diversity in knowledge creation and information production. Therefore, multi-generational design should be used and recognized widely for the benefit of the organization.

In today's office environments, Generation Y is the dominant generation that influences changes in nature of work; therefore brings different assets to the office environments regarding its characteristics. However, office designers now have the responsibility to consider not only the new and upcoming requirements of latest generation, but also with the consideration of earlier generations in order to be able to serve everyone an appropriate environment for their future design.

Assets of today's office environments have been generated or taken one step further by Generation Y. Due to the discussions in literature on generational gap, challenges and differences, the current applications of these assets of Generation Y, constituted by the level of communication technology of their period, are skipping the values of earlier generations and the office types that they are used to work in, are creating a chaos in office environments. In today's world of which every individual is accepted as a value that will contribute information and knowledge, the decreasing performance of a generation, especially elderly generations, due to the design of the office environment is out of the question.

Most of the discussed assets of today's office design earlier in this study were preexisted. What made them different today is the level of

communication, accessibility and comfort factors which have changed the vision of the latest generation and of course technology either in product forms or as a part of environment; material, lightening, networking, acoustics, and so on.

Except for the assets of mobility, flexibility, 3rd spaces, storage and privacy that are mentioned in the work of Anjum et al. (2005), other features; simplicity, appearance, image, ergonomic suitability, training, environmental and ecological issues, cultural implications and cost implications are closely relevant to Traditionalists, Baby Boomers and Generation X. Hence, transforming the office environment to a more aesthetically coherent environment, expressing brand identity through the entire design, increasing the use of technologically advanced, adjustable furniture, increasing the level of consciousness of the use of natural energy sources, as well as protection of them by using readymade or recycled materials, placing of physical elements according to cultural values, performing cost cutting ideas on design are the action that Traditionalists, Baby Boomers and Generation X will accept and furthermore, contribute on the subject by their experiences.

On the other hand, the assets transformed by the chosen level of communication may have negative effects on these earlier generations. As discussed earlier, the latest generation leans towards all kinds of communication styles in office environments. In order to be able to work in all modes with flexibility, this generation prefers re-arrangeable office furniture which may put elderly generations in an uncomfortable position regarding their resistance to change; Generation X may tolerate this new mode of office design; whatever that makes them perform better. Consequently, privacy may be a problem for earlier generations in these open to communication at all levels environments; however, this problem can be eliminated through appropriate design with the help of adequate technology related products and services.

Furthermore, flexibility brings 3rd spaces in office environments which are also a dominant preference of Generation Y because of their need to

balance work and life to perform better. Traditionalists may have reservations about socializing in office environments; however it is tolerable due to their primary needs of socializing.

Mobility, which emerged as a direct result of the improved technology; wireless devices and networking through internet, is a new spreading trend. Organizations that encourage their workforce in this style have designed office environments accordingly. The furniture is designed according to the `hotelling` trend rather than being static and belong to a specific individual. However, this new approach to the office environment may be too edgy for earlier generations due to their strict idea upon owning a desk, storage unit, a computer. As a result, these environments on mobility asset may result in the failure of some generations and this situation will not be tolerable by the organizations that expect the optimum performance from their workforce.

It is obviously important that office environment supports each generation separately due to their different needs for optimized performance. As visualized in figure 5.1, they all have their ideal office environment that best suits their characteristics. Hence, strategies towards multi-generational design in office environments are towards these separate visions of each generation.



Figure 5.1: Comparison of Four Generations (Office Snapshots, Early Office Museum, Herman Miller, Nurus retrieved in 15 December. 2009).

As mentioned earlier, furniture designers are not the only contributors to today's offices environments. Since the environmental qualities of offices have been especially mentioned, also designers from different design areas are needed to collaborate with each other as well as from the other disciplines such as psychology, ergonomics and so on in order to constitute the appropriate environment for workforce.

Costs, spatial layout, services and aesthetic issues are some facts that designers are entitled to consider while designing an office environment while challenging the multi-generational consideration as well (Anjum, Paul and Ashcroft, 2005).

The future of office environments does not seem to steer away from challenged procedure while constituting the design in practice. The studies and developments implemented on the way to the future, are structuring around the advancement of the technology and its possible ways of integration into office environments. Therefore, technology will be needed to be taken seriously into consideration as an independent and constantly evolving variant for the developments in the office environments.

Consequently, it can be said that it would be better to consider generational diversity of the workforce as a design factor in today's office environments' design and also the future design based on predictions about the preferences of upcoming generations.

5.1 Implications for Further Research

Considering this study as a source of reviewed literature on the multi-generational diversity as a factor in designing office environments, this study can be considered as an initial study that is a precursor of increasing importance of the fact of generational diversity in office

environment design and it can be embraced as an introductory study on the characteristic of multi-generational workforce.

Further research can be conducted either to support this study by an empirical study in an office environment on how different generations live and work together in the recent office environments or this study can be taken one step further, or, a design project might be conducted additionally to set an example for an appropriate example for multi-generations in office.

This new trend of taking multi-generational diversity in the offices as a design concern can be re-analyzed by overlapping other popular trends such as universal design, sustainable design and so on.

According to Yassine (n.d.) multi-generation as a design consideration can be explained by technological improvement and consumer taste of change of generations. Hence, the office environment can also be analyzed based on the products that are used and influencing the performance of each generation.

The separate effects of economic, social, cultural and political facts that have influenced a specific generation can be analyzed and compared to the purpose to depict the differences between generations and their perception of office environments.

Because this study is dwelled on the combi-offices; the relation between the multi-generational workforce and office environment design assets of combi-offices will differ in other types of office environments. Therefore, it may be provoke to relate this study on other types of offices mentioned earlier.

Furthermore, an empirical study can be conducted to explore the expectations of upcoming generations from the future office environments as well as its every component. In addition, a similar study can be generated to the question of if there is a relation between

generational differences in Turkey and work habits of Turkish people and the office environment.

As mentioned earlier, the academic studies are scarce on this subject; therefore research on the subject of generational diversity in office environments is needed in all means as for all the other multi generational environments.

REFERENCES

- _____. (n.d.). Analysis Of Modern Office Furniture Design Features. Unpublished. Zhoushi Furniture Corporation. Retrieved 4 May 2009, from <http://www.cn-officefurniture.com/knowledge/officefurniture-design/588.html>
- Anjum N., Paul, J., Aschcroft R. (January 2005). The Changing Environment of Office: A Challenge for Furniture Design. *Design Studies*; Vol. 26, No. 1, pp. 73-95.
- Arnold, T., Klauck B. (2002). Principles of Project Selection and Classification. In R. Hascher, S. Jeska, B. Klauck (Eds.), *A Design Manual: Office Buildings* (pp. 82-89). Birkhauser Publications.
- ASID. (n.d). Workplace Values: How Employees Want To Work. Unpublished Report. . Retrieved 5 February 2009, from http://www.asid.org/NR/rdonlyres/6E60E71C-2A2A-4BFB-A579-AFC57AD82019/0/workplace_values1.pdf
- Barber, C., Laing, A., Simeone, M. (21 March 2005). Global Workplace Trends: A North American And European Comparison. *Journal of Corporate Real Estate*, 7 (3), pp. 210-221.
- Bauer, W., Kern, P. (2002). New work: Office Work in Global Networks. In R. Hascher, S. Jeska, B. Klauck (Eds.), *A Design Manual: Office Buildings*, (pp. 29-31). Birkhauser Publications.
- Becker, T. J. (n.d). Bridging the Generation Gap. Edward Lowe Foundation. Unpublished. Retrieved 3 October 2009, from http://www.esmallooffice.com/SBR_template.cfm?DocNumber=PL12_4745.htm
- Brand, J. (August 2005a). Do Open Plan Offices Work? *Electronic Magazine*. Haworth Incorporation. Retrieved 7 January 2009, from http://organicworkspaces.com/pdf/Do_Open_Plan_Offices_Work.pdf
- Brand, J. (August 2005b). How Does Office Design Influence The Nature Of Office Work? : Should Your Company Transition From Traditional Private Offices To An Open Office Plan? *Electronic Magazine*. Haworth Incorporation. Retrieved 7 January 2009, from http://brigholme.com/resources/Should_Your_Company_transition_from_Traditional_Offices_to_an_Open_Space_Plan.pdf
- Brand, J. (August 2005c). New Metaphors For Office Design. *Electronic Magazine*. Haworth Incorporation. Retrieved 7 January 2009, from

<http://www.makespacework.com/uploads/architects/new%20metaphors%20for%20office%20design.pdf>

Brand, J. (August 2005d). Office Environments To Support Future Organizations. Electronic Magazine. Haworth Incorporation. Retrieved 7 January 2009, from http://organicworkspaces.com/pdf/Office_Environments_Support_Future_Organizations.pdf

Brennan, A., Chugh, J. S., & Kline, T. (May 2002). Traditional Versus Open Office Design: A Longitudinal Field Study. *Environment and Behaviour*, 34 (3), pp. 279-299. Sage Publications

Buckley, R. (2007). "Hot Desking" or "Hoteling". Unpublished Article. Retrieved 27 May 2009, from <http://www.businesssolve.com/index.php/News-Press/qhot-deskingq-or-qhotellingq.html>

CABE BCO (2005). The impact of office design on business performance, Commission for Architecture and the Built Environment, British Council for Offices.

Caldwell, D. (2006). Generations in the Workplace. Unpublished Presentation. Retrieved 7 October 2009, from <http://www.slideshare.net/caldwdo/generations-in-the-workplace>.

_____. (n.d.). A Caruso St. John Site. Retrieved 15 June 2009, from <http://www.carusostjohn.com/>

The Center for Generational Studies. Web Site. Retrieved 28 September 2009, from <http://www.gentrends.com/faq.html>

Clarey, J. (25 February 2009). Multi-Generational Learning in Workplace: Overview and Instructional Design Considerations. Unpublished Presentation. Retrieved 7 October 2009, from <http://www.slideshare.net/jclarey/multi-generational-learning>

Danielsson, C. B., Bodin, L. (14 March 2008). Office Type in Relation to Health, Well Being, and Job Satisfaction Among Employees. *Environmnet and Behaviour*; Vol. 40; No. 5. September 2008. pp. 636-668. Sage Publications.

Danielsson, C. B. (2008). Office Experiences. In H. N. J. Schifferstein, P. Hekkert (Eds.), *Product Experience* (pp. 605-628). Elsevier Ltd.

DEGW. (2009). About DEGW History. Official Web Site. Retrieved 13 September 2009, from http://www.degw.com/about_history.aspx

Duffy, F., Tanis, F. (1993). A Vision of the New Workplace. Conway Data Incorporation. Industrial Development Section 1. pp. 427-432.

Duffy, F. (1997), The New Office, Conran Octopus, London, .

_____ (n.d.) Early Office Museum. Retrieved 8 August 2009, from <http://www.officemuseum.com/photographs.htm>

Elsbach, K. D., & Bechky, B. A. (2007). It's more than a desk: working smarter through leveraged office design. California Management Review , 49 (2), pp. 80-101.

_____ (2006). Embracing Boomers: How Workplace Design for Maturing Knowledge Workers Benefits Everyone. Electronic Magazine. Herman Miller Incorporation. Retrieved 29 August 2009, from http://www.hermanmiller.com/MarketFacingTech/hmc/research_summaries/pdfs/wp_Embracing_Boomers.pdf

_____ (2003) Familiar places in new spaces. Electronic Magazine. Steelcase Incorporation. Retrieved 13 April 2009, from http://www.steelcase.com/na/360_familiar_places_in_new_s_Research.aspx?f=19980

Franz, D. (2008). The moral life of cubicles. The New Atlantis (19), pp.132-139.

_____ (n.d.) From Carbons to Computers: The changing American office. (1998). Smithsonian Institution. Retrieved 29 April 2009, from <http://www.smithsonianeducation.org/scitech/carbons/start.html>

Galitz, W. O. (1984). The office environment: Automation's impact on tomorrow's workplace. Willow Grove, PA: Administrative Management Society Foundation.

_____ (n.d.) Generation Watch. (17 September 2007). Unpublished. Retrieved 15 October 2009, from <http://home.earthlink.net/~generationwatch/>

_____ (n.d.) Gensler. (2008). Workplace survey. United States. A design and performance report. Unpublished Report. Retrieved 18 January 2009, from

http://www.gensler.com/uploads/documents/2008_US_Workplace_Survey_10_21_2008.pdf

Greenhalgh, B. (23 August 2002). Space SIG 6: The state of the office - the politics and geography of working space. Unpublished Article. Retrieved 21 February 2009, from <http://www.knowledgeboard.com/cgi-bin/item.cgi?id=853>

_____ (n.d.) Guide to Cybernetics. Retrieved 3 June 2009 from <http://www.pangaro.com/published/cyber-macmillan.html>

Hammil, G. (2005). Mixing and Managing Four Generations of Employess. Electronic Magazine. FDU Magazine Online. Retrieved 27 October 2009, from <http://www.fdu.edu/newspubs/magazine/05ws/generations.htm>

Herman Miller Incorporation. Web site. Resolve. Retrieved 15 October 2009, from <http://www.hermanmiller.com/DotCom/jsp/designResources/imgSearchResults.jsp?cp=1&st=&rpp=75&prodId=150&cw=&ce=&cd=>

_____ (2008) The Home Office Concept. Unpublished. Retrieved 23 August 2009, from <http://gomestic.com/home-business/the-home-office-concept/>

_____ (n.d.) Johnson Wax Building. Web Site. Retrieved 12 June 2009, from http://www.greatbuildings.com/buildings/Johnson_Wax_Building.html

Kauf, J. (2003). Multigenerational Marketing Grows Up. Unpublished. Fashion Group International Incorporation. Retrieved 1 December 2009, from <http://www.joycekauf.com/pdfs/multigen.pdf>

Kristy, J. (2007). The Changing Workforce: Urgent Challenges and Strategies. Unpublished Presentation. Retrieved 7 October 2009, from <http://www.slideshare.net/jkristy/multigenerational-issues-in-the-changing-workforce>

Lancaster, L. C. (17 March 2004). When Generations Collide: How to Solve the Generational Puzzle at Work. Management Forum Series 2003-2004.

Lee, J. (2007). Talking About My Generation: A look at the Generations in Our Workforce. Unpublished Presentation. Retrieved 7 October

2009, from <http://www.slideshare.net/jdevors/multigenerational-presentation-presentation>

Lisberger S, Macbird B. (1982) Tron. Unpublished. Retrieved 6 May 2009, from <http://adamcadre.ac/calendar/11912.html>

Littler, C. (June 1978). Understanding Taylorism. The British Journal of Sociology , 29 (2), pp. 185-202.

_____ (2006) Maintaining Productive Privacy in an Open Workplace. Electronic Magazine. Haworth Incorporation. Retrieved 23 March 2009, from <http://www.haworth.com/en-us/Knowledge/Workplace-Library/Documents/Maintaining-Productive-Privacy-in-an-Open-Workplace.pdf>

_____ (2007) Managing multiple generations in the workplace. Electronic Magazine. Allstell Incorporation. Retrieved 15 February 2009, from http://www.allsteeloffice.com/NR/rdonlyres/E7553C90-F6F0-4C62-8224-031D8DE6CC82/0/allsteel_generational_paper.pdf

_____ (2007) Measures of success. Electronic Magazine. Herman Miller Incorporation. Retrieved 2009, 13 February from http://www.hermanmiller.com/MarketFacingTech/hmc/research_summaries/pdfs/wp_Measures_of_Success.pdf

_____ (2009). Meet Max De Pree. Max De Pree Web Site. Retrieved 7 May 2009, from <http://www.depree.org/html/moremax.html>

_____ (2009). Multi-Generational Design the Hot Trend at Home. Unpublished. Retrieved 16 October 2009, from <http://www.northumberlandtoday.com/ArticleDisplay.aspx?e=1974884&auth=>

Nelson, A. (2008). Your Generation or Mine? Recruiting and Managing the Generation Mix. Go Jobbing. pp. 54-55.

Notter, J. (2002). Generational Diversity in the Workplace. Unpublished. Notter Consulting. Retrieved 23 October 2009, <http://www.notterconsulting.com/Articles/generationaldive.html>

Nurus Incorporation. Web site. Resolve. Retrieved 15 October 2009, from <http://www.nurus.com>

_____ (n.d.) Office Snapshots. (n.d). Retrieved 5 April 2009, from <http://www.officesnapshots.com/2008/03/19/google-zurich-offices/>

- Olmstead, C., Avila, R. (June 2009). Trust in a Multi-Generational Workforce Unpublished Presentation. Retrieved 7 October 2009, from <http://www.slideshare.net/BarbaraTWG/trust-in-a-multi-generational-workforce>
- _____ (n.d.) Old Models, Are They Still Satisfactory? Unpublished. Concept International By Consultancy. Retrieved 23 September, from <http://www.conceptinternational.nl/home2.htm>
- _____ (2007) On the move: How Mobile Employees Are Changing the Workplace. Electronic Magazine. Herman Miller Incorporation. Retrieved 24 April 2009, from http://www.hermanmiller.com/MarketFacingTech/hmc/research_summaries/pdfs/wp_MobileWorkers.pdf
- Raymond, S., Cunliffe, R. (1997), Tomorrow's Office, E&FN Spon, London
- Reeves, T. C. (2006). Do Generational Difference Matter in Instructional Design? Department of Educational Psychology and Instructional Technology. University of Georgia. Retrieved 24 October 2009, from <http://it.coe.uga.edu/itforum/Paper104/ReevesITForumJan08.pdf>
- _____ (n.d.) Resolve. (2006). Business Furniture Incorporation. Retrieved 15 October 2009, from <http://www.bfionline.com/resolve.htm>.
- Schmidt, W. & Dorsey, M. E. (1986). Office design: The Spatial Dimension of Organizational Communication and Reflector of Communication Climate. Houston, TX: Annual Meeting of the Southern Speech Communication Association
- Shinn, K. (6 April 2006). Managing Intergenerational Workforce Increases Workplace Productivity and Harmony. Career Partners International. Retrieved in 3 September 2009, from <https://www.cpiworld.com/en/art/101/>.
- Silver, L. S. (August 2009). The Multi-Generational Workforce: Managing, Motivating and Leading. Unpublished Presentation. Retrieved 7 October 2009, from <http://www.slideshare.net/lsilver/the-multigenerational-workforce-1915284>
- Soares, C. (27 March 2001). U.S. Suffers of 'Epidemic of Sleepiness,' Study Says. Reuters . Retrieved 2 April 2009, from <http://www.rosenet.org/quest/NewsArticles/2001/Sleep.htm>

Schwartz, A. (2008). Generations at Work, Understanding and Influencing. Unpublished Presentation. Retrieved 7 October 2009, from <http://www.slideshare.net/readyssetpresent/generations-at-work-powerpoint-presentation>

_____ (n.d) Tips to Improve Interaction Among the Generations: Traditionalists, Boomers, X'ers and Nexters. National Oceanographic and Atmospheric Association Office of Diversity Web Site. Retrieved in 13 October 2009 from <http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/intergencomm.htm>.

Tobin, R. (4 February 2004). Adopting change. Electronic Magazine. Steelcase Incorporation. Retrieved in 10 June 2009, from <http://www.steelcase.com/Files/1a293931003c421b8ef930f09a10b6b7.pdf>

Twenge, J. M. (2006). Generation Me. Retrieved 18 October 2009, from <http://www.generationme.org/aboutbook.html>

_____ (13 May 2009) Used cubicles have benefits. Retrieved 15 May 2009, from <http://officeinteriordesign.wordpress.com/2009/05/13/used-cubicles-have-benefits/>

Venezia, C. (2007). The Voice of Mobile Workers. Electronic Magazine. Knoll Incorporation. Retrieved 15 April 2009, from <http://www.knoll.com/research/downloads/VoiceofMobileWorkers.pdf>

_____ (4 June 2007) Working in four-part harmony. Electronic Magazine. Steelcase Incorporation. Retrieved 13 April 2009, from http://www.oene.com/sw/swchannel/CustomerCenter/documents/6870/2/Working_in_FourPart_Harmony...360_June07.pdf

Wymer, T. D. (2008). Magnet Space. Electronic Magazine. Knoll Incorporation. Retrieved 15 April 2009, from http://www.knoll.com/research/downloads/wp_changing_private.pdf

Wymer, T. D. (2009). The Changing Private Office. Electronic Magazine. Knoll Incorporation. Retrieved 15 April 2009, from

Yassine, A. A. (n.d). Parametric Design Adaptation for Competitive Products. Unpublished. Product Development Research Laboratory. Department of Industrial and Enterprise Systems Engineering; University of Illinois. Retrieved in 12 October 2009, from http://www.iese.illinois.edu/pdlab/Papers/Design_Evolution.pdf