

Exploring Transformation of Concept and Design Strategies of Office Space

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ABSTRACT

The organization of office spaces is directly related to the technologies used and the workflow dynamics. A vast usage of lap-tops and internet connection has made a strong impact on the mobility possibilities of the office space users and consequently to the conceptual approaches related to the ways these spaces are designed. Portable devices and wireless internet allow employees to do their work in any place that they want. They can do their work from different places such as home, café or even from another country. Instead of face to face interaction, a new type of collaboration and interaction which is called virtual collaboration or virtual work has been appeared. So, the nature of work and the meaning of the workplace have fundamentally changed. In this new era interior architects are facing with the question of how the new generation offices should be organized and designed and to be able to answer this question one should have first an insight about how the office work, and approach to the office employees are in these offices.

There are many studies about furniture design in offices, about lighting design and its influence on the performance and/or psychology of users, personalization issues in offices and similar topics however there is very little research looking at the current trends regarding work organization and how these influence the design of office interiors, mainly in terms of spatial (design) structure and organization. The main aim of this research is to investigate the latest changes and tendencies in offices in terms of technology and work organization. In this way, the study aims to prepare a conceptual framework for understanding the underlying factors in design of the next generation offices and to detect strategies that can be used by interior architects in

design of these offices. Some most recently designed Google company's offices have been chosen as the cases to be studied in this research as this company is accepted as a pioneer in design of new age offices.

Keywords: New-Age Office, Office Spaces, Interior Design, Office Technology.

ÖZ

Ofis alanlarının organizasyonu, kullanılan teknolojiler ve iş akışı dinamikleri ile doğrudan ilişkilidir. Dizüstü bilgisayarların ve internet bağlantılarının geniş kullanımı, ofis alanı kullanıcılarının mobilite olanakları ve dolayısıyla bu alanların tasarlanma şekillerine ilişkin kavramsal yaklaşımlar üzerinde güçlü bir etki yaratmıştır. Taşınabilir cihazlar ve kablosuz internet, çalışanların işlerini istedikleri yerde yapmalarını sağlar. İşlerini ev, kafe veya hatta başka bir ülkeden farklı yerlerde yapabilirler. Yüz yüze etkileşim yerine, sanal işbirliği veya sanal çalışma adı verilen yeni bir işbirliği ve etkileşim türü ortaya çıkmıştır. Böylece işin doğası ve işyerinin anlamı kökten değişmiştir. Bu yeni çağda iç mimarlar yeni nesil ofislerin nasıl organize edilmesi ve tasarlanması gerektiği sorusuyla karşı karşıyadırlar ve bu soruyu cevaplayabilmek için öncelikle ofisin nasıl çalıştığı ve ofis çalışanlarına yaklaşım hakkında bilgi sahibi olmalıdırlar.

Ofislerde mobilya tasarımı, aydınlatma tasarımı, kullanıcıların performansı veya psikolojisi üzerindeki etkisi, ofislerde kişiselleştirme ve benzeri konular hakkında birçok çalışma vardır, ancak iş organizasyonu ile ilgili mevcut eğilimler ve bunların ofis iç mekanlarının tasarımı ve organizasyonunu nasıl etkilediğine dair çok az araştırma vardır. Bu araştırmanın temel amacı, ofislerdeki son değişiklikleri ve eğilimleri teknoloji ve iş organizasyonu açısından incelemektir. Bu çalışma, yeni nesil ofislerin tasarımında temel faktörleri anlamak ve iç mimarlar tarafından bu ofislerin tasarımında kullanılacak stratejileri tespit etmek için kavramsal bir çerçeve hazırlamayı amaçlamaktadır. En son tasarlanan bazı Google şirket ofisleri, yeni çağ

ofislerinin tasarımında öncü olarak kabul edildiğinden, bu arařtırmada incelenecek vakalar olarak seçilmiřtir.

Anahtar Kelimeler: Çağdař ofis, Ofis alanları, İç mekan tasarımı, Ofis teknolojisi

To my beloved Parents

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Chapter 1

INTRODUCTION

1.1 Background

The office phrase initially derived from the Latin word “officium” (duty). “opificium” from “opus” (to work) and “facere” (to make) (Müller, Ohnheiser, Olsen, & Rainer, 2015). An office is a place that people come together to participate in activities and sharing information and using technology; it is a daily work environment. The employees who work in an office use space for different tasks, such as typing, filing, accounting, reading, writing, drafting, operating computer, conducting interviews, meeting, etc. in both possibility of a group or individually for a temporary or specific period (Duffy, 1992).

According to Marberry (1994), early work environments were located in a small room at houses. Until the 18 century, they didn't change a lot. In the late 18th century and through the industrial revolution, radical changes in the layout of office happened (Marberry, 1994). It was the time that office buildings emerged as a particular building type.

Developments in technology have caused enormous changes in work patterns. Telephone and telegraph were the first devices used in offices for communication. Other types of equipment such as mechanical calculator, typewriter and Xerox

machine were added to the office to make employees work easier. With the emergence of computers, radical changes happened in office layout and furniture.

Desktop computers were massive and it was not possible to move them easily. So employees had to work in their offices behind their desks because their computers had to connect to the power outlet with wire thus they couldn't move to other places, and there was a dependency between employee and office. After a while, new generations of computers emerged. They didn't need too much space and the screen became flat.

Employees became accustomed to work with computers over time. Computers made their job easier and faster for example it was easier to keep all the document files in a hard disk rather than in drawers and it was much easier to reach them when needed. The emergence of computers had a huge impact on the office interior space, basically because there was no need for extra spaces and furniture to keep documents.

Information technology developed and wireless internet and wireless devices such as laptops emerged. They brought mobility and flexibility to the work patterns and gave a chance to the employee to do their work virtually from anyplace. All these developments in information technology (IT) caused changes in office layout.

Office layouts changed during years according to some factors such as human needs, organizational needs and also technology. Offices can be categorized according to their design layout as follow: 1) Closed plan offices 2) Open plan offices 3) combi offices.

Until the beginning of the 20th century, cell offices which were equipped with desks and chairs for one or two workers were popular. However, as the office works begin

to be more complicated and as the number of employees in an office increased, a new layout known as the open-plan office emerged. Taylor's idea about Scientific Management was a source of inspiration in creating these offices. Taylorism or Scientific management is a theory of management that analyzes workflow. In Ford Company, to bring efficiency into the work environment, Fredrick Taylor broke down complicated tasks into small repetitive activities that could quickly be performed by less qualified workers (and because of that at lower wages) (Becker & Sims, 2001). Taylor's theories affected the office environment intensively and created many of the organizational structures that are common nowadays. The clerical work in the office was also changed into a set of individual tasks, which needed less skill from the worker side.

Companies supported open plan layout mainly because of financial reasons. Many workers could work in one open space and they didn't need private rooms. So, employers preferred to use this layout to reduce their costs.

On the other hand, lack of privacy and too much noise in this kind of office caused problems for employees. Therefore, other types of office layout called "Combi office" emerged. Combi offices bring privacy to the open layout and it's a good way to control the noise and privacy. Today most of the offices have mixture.

On the other hand, the new developments in Information technology such as the advent of the internet and portable computers have an enormous impact on office works. Particularly there are a lot of office tasks that can be done by personal computers and there is no need for a certain space to work. Employees can carry their laptops and

work in a café or any other place. So, many tasks may not need a certain physical place called office to be done anymore.

These changes have brought serious discussions about the concept of office, the function of the office and the role of the office in our current time. This study aims to discuss these changes in office work and to find how these new technologies has affected the work and interior design of the offices in this new era.

1.2 Problem Statement

In the contemporary era, the role of the office and office space are radically changing due to advanced technology. Every person with a personal laptop can sit in any place and do his/her job quickly and with Wi-Fi internet, he/she can easily make a connection with other colleagues. They can have a video call or conference call meeting and they don't need to meet each other in a classical meeting room or an office.

It seems that the new technology has brought a new era in the design of office that is different from before. These changes have resulted in a need to redefine the office concept and its function and to develop new approaches to office interior design. The problem discuss how these changes have affected the organization of office work, and consequently the layout and interior design of the workspaces.

1.3 Purpose of Study and Research Question

The main aim of the present study is to expose how information technology such as internet, wireless devices, and portable computers are changing the office meaning, layouts and interior design. This can help designers to consciously create more suitable

interior spaces in offices to increase employee productivity, efficiency and wellbeing.

This study tries to answer the following questions:

How the office concept has been changed in new-age offices?

- How has office evolution from the past until today happened?
- What is the impact of technology on these changes?
- How new technologies are changing the meaning of office, office work and office layout today?

1.4 Method of Study

This study is divided into two main parts. The first part is an inclusive literature survey. The literature survey looks for how the evolution of office has happened and how different technologies have changed office layout and design. It goes on to search for the offices of the new age, the meaning of office and how the concept of office has changed in new ages and what are the characteristic of these offices. At the end of this part a summary checklist of concepts and design strategies used in the new age offices found in literature review are collected in a table.

The second part of the study which is the case study part, is comprised of two parts. In the first part. some keywords about how Google company approaches to its office design are driven out of the interviews and speeches of designers and CEOs of Google offices. In the second part, an analysis of some Google offices are done using the table formed as the result of the literature review and the keywords found from the interviews. the study ends with a complete discussion about the results of the analysis. In conclusion, this study aims to provide designers with significant information that helps them in design of new offices.

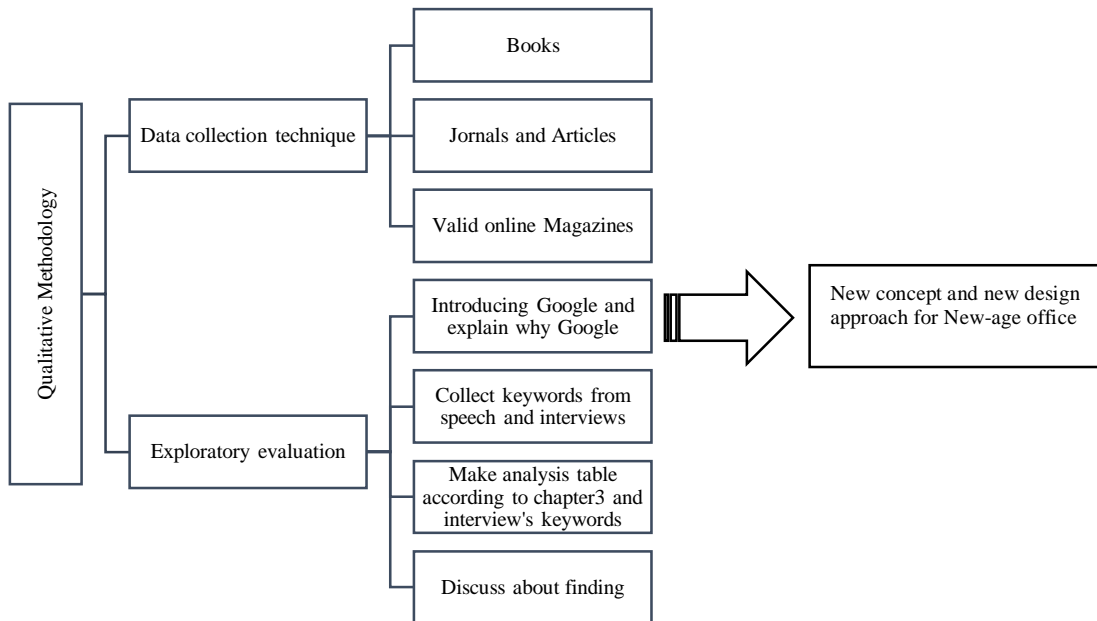


Figure 1: Method of Study

1.5 Structure of the Thesis

This thesis consists of five chapters. As figure 2 shows the thesis structure the first chapter is the introduction part, which explains the goal of the study and its methodology.

The second chapter explains the history of the office briefly. It evaluate how the technology has impacted the office works and layouts and how they have changed in time. Also, it describes different types of office layouts in detail.

Chapter three explains the new-age office, and it has two main parts. The first part describes the new concepts which have emerged in the new age offices. The second part describes the new strategies that designer use in the new age office designs.

Chapter four includes a case study and explains the method of the case study step by step. After explanation, there is an analysis of seven Google offices, discussion and finding.

The last chapter is a conclusion that includes summary of findings and possibilities for further study.

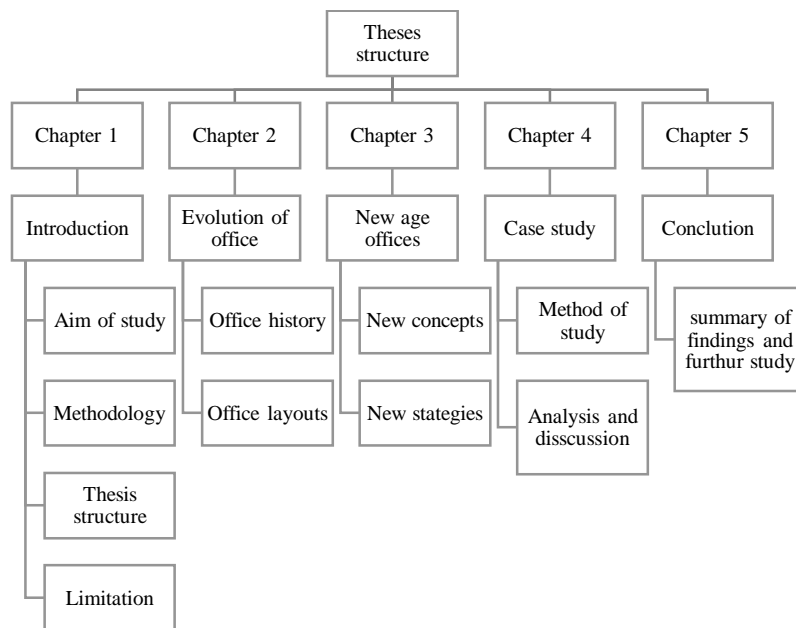


Figure 2: Thesis Structure

1.6 Limitations of the Thesis

This study does not include all types of offices. It is about new-age offices that focus on work with knowledge workers, and they don't have one to one connections to the customer. They are different from offices such as bank office or account office.

Chapter 2

EVOLUTION OF OFFICE IN TIME

A workplace is an organization comprised of numerous coordinating elements. It is simply an environment for doing work. Work always involves production and production exists in different forms; these could include the production of material goods, transmuting information, and supplying a needed service. Taylorism or scientific management theory which used in workplaces is the result of a sudden change in the nature of work produced that requires skilled and inventive workers.

The layout of offices has changed in time according to some factors such as changing the technology used in the offices and human needs. The offices should accommodate both the user's needs as well as functional needs. Understanding of user's needs, office work, and task requirements are significant for achieving good design.

This research is about the new generation workplaces but to understand it better some general information about how office concept changed in time is given. This chapter is divided into two parts. The first part explains office history and how the layout of office changes with the technologies used in the office and the second part explain office layout and types of office.

2.1 History of Office Development

The office design has changed a lot during the 20th century because of high information technology. This by no means suggests that offices do not possess any early history.

The dawn of office buildings dates back to the 14th and 15th centuries people used part of their living rooms as office space for working. This went on until the emergence of the industrial revolution in the late 18th and early 19th centuries, as figure 3 shows whereby the office was highly desired to be independent of other rooms (Marberry, 1994). This transition was perceived as highly successful and satisfactory because it guaranteed total privacy and high concentration and focus on the work. Over the years, the rise in the demand for sophisticated work skills as well as office device tools resulted in the rapid change of working spaces. The primary offices had different equipment and technology than today's offices and the connection between employees was not like today that everyone has a computer, cellphone or tablet with an internet connection to make fast and easy communication. Telegraph was one of the communication devices used for long-distance communication and was developed in 1830 by Samuel Morse (Cortada, 2000).



Figure 3: French Post Office at the Time of Louis XV (1710 - 1774) (Cortada, 2000).

In time new equipment was added to the office to make employees work easier. Mechanical Calculator (Figure 4) was another office equipment used in the office from 1851. Various calculators designed in 1851 such as Comptometer, Odhner Arithmometer and Arithmometer and each one had a different user interface. Between them, the Arthmometer was the first digital mechanical device used in the office for daily works (Williams, 1997) .



Figure 4: A Group of 1940s Ladies at Work on Silent Speed Mechanical Calculators (Williams, 1997).

After telegraph another communication device was invented by Elisha Gray and Alexander Graham Bell in the 1870s that could electrically transmit speech (the telephone). Offices began to use the telephone to communicate with other companies

and suppliers. This rendered a phone an indispensable office tool (Cortada, 2000).

Figure 5 shows the police offices with telephone in 1070th .



Figure 5: A Police Station Office in the 1970s (Cortada, 2000).

Over the years, the design of office furniture such as desk or chair was modified because of the advance of office tools. For example, the Roll top desk, which was popular in offices was changed after the emerge of the typewriter machine. According to Cortada (2000) Desk designs such as the Rolltop desks became outdated because of the popularity of typewriters. It was in 1874 when the first typewriter was commercially introduced but it was uncommon in offices till after the 1880s. The typewriter became a default mode of writing except for any correspondence that was preferred handwritten. The typewriter was prevalently used professionally, in offices, business correspondence and private homes (Cortada, 2000). The Rolltop desk design had to be completely modified to accommodate the typewriter because it couldn't fit

on the Rolltop because of its size, volume and shape. Figure 4 demonstrates a Rolltop desk and an early version of a typewriter. An increase in the office workforce increased the demand for typewriter usage and this increased the need to modify the Rolltop desks to accommodate the typewriters. The need to use pen and paper to produce fewer documents evolved towards the need to use a typewriter to produce the bulk of documents at a given time and this permanently altered the future of desk designs (Crouzier, 1965).



Figure 6: Roll- Top Desk and Typewriter (Crouzier, 1965).

After the invention of the telephone, the typewriter, and calculator, another indispensable technology, photocopy machine, made its way into the office environment. Chester Carlson invented the very first commercially successful photocopier machine in 1959. Xerox 914 became popular in offices but it was big and slow by today's standards (Myers, 2005).



Figure 7: Xerox 914 Photocopies Machine (URL1).

Work patterns and workplace layout drastically changed in the 1980s due to the advent of Information Technology. In the later years, business and technology grew bigger and made it mandatory for every employee to have full access to a computer to contribute to the information input necessary to achieve work quota (Duffy & Powell, 1997).



Figure 8: Computers at the Office (URL2).

Personal computers became common office machines in the 1980s. It was expected by general public that computers would completely transform office design.

Computers started off as bulky machines occupying the cellar and through innovation, they found their way onto the employee desktop (Van Meel, 2000). Toffler (1980) stated that organizations would inevitably be transformed by personal computing: “Put the computer in people’s homes, and they no longer need to huddle. White-collar work will not require 100 percent of the workforce to be concentrated in the workshop” (Toffler, 1980, p. 199). In 1981 Osborne 1 was introduced to the market as the first portable computer (Hogan & Iannarnico, 1982).



Figure 9: Osborne 1, First Portable Computer (Hogan & Iannarnico, 1982).

Duffy in his book “The Changing Workplace” states that significant changes within office layout were influenced by desktop computers therefore, the focus in office buildings in this decade was led towards individual interaction with digital information rather than employee communication. Workers were restrained onto their workstations by desktop computers during working office hours (Duffy, 1992).

The presale of personal and portable computers in the office was going to change the whole office work in 1997. Christopher Baldry foresaw these changes when he wrote office buildings would soon become obsolete because people will be able to work from anywhere in the world using their personal computers (Baldry, 1997). The 'computerization' of the office became a global development. USA and UK researchers

by DEGW (a leading architectural firm specializing in the work environment in the UK), and ORBIT (Office Research: Building and Information Technology) carried out a study to investigate office design and information technology. This was to explore ways in which Information Technology could affect office building's design, office interiors and environment services. The research influenced British office projects and later worldwide office designs in the 20th century (Duffy & Powell, 1997). The main issues experienced within office buildings were undisciplined cabling behind the devices, concentrations of heat, lack of appropriate ventilation system to control hot spots, susceptibility of electric devices to glare and dust, the security of information within and between offices, and ergonomic crises caused by using of keyboards and screens. ORBIT and DEGW mitigated these issues through their wide-ranging research (Duffy & Powell, 1997).

The modern office design with its distinct style, stylish layout and cutting-edge office technology became prevalent in the early 20th century. The United Kingdom is one of the European countries that the number of skilled workers for office work increased in the twenty century. Significant growth of office workers from 0.8% in 1851 to 7.2% in 1921 was recorded. Incorporation of cutting-edge technology within an office environment, such as desktops, internet and wireless devices, positively enhances an office layout (Van Meel, 2000).

As using computers became more popular people could do their job from a long distance like homes. So more employees started to work at home and a new way of work appeared which is called "home office". As Christensen (1987) states, home office is the possibility of different flexible work arrangements created by a

combination of automated offices, personal computers, telecommunication advances and home-based work (Christensen, 1987) .

Sometimes employees may prefer to do their works from home and this may mean from one day a week to virtually full time. On the other hand, work-at-home can bring the possibility for extreme flexibility in schedule and lifestyle for the workforces; theoretically, they can work when and where they want in a more casual atmosphere (Kelly, 1988; McCloskey, & Igbaria, 1998; Sullivan & Lewis, 2001).

Another form of telework that emerged in the mid-1990s was called the virtual office (Callentine, 1995). In virtual office to promote flexibility in the work location, workers were given portable telecommunication equipment, including a laptop computer with a built-in modem and fax, a cellular phone and an alphanumeric pager (Greengard, 1994). This equipment was portable enough to fit inside a briefcase and could be carried easily. Telework expediated the anytime, anyplace office, unlike the traditional telecommuting that only used home as the only alternative worksite (Galinsky, Bond, & Friedman, 1993). Any location that best suited the virtual office could be used by the employee. The major motivation for companies to recruit virtual office employees was because of the reduced expenses that accompanied such a route as the traditional office space had become very expensive whereas the expenses of portable telecommunications equipment had drastically dropped (Jeffrey, Hawkins, & Miller, 1996).

According to John and Gratton (2013) three waves of work virtualization, and thus three models of work organization, have developed in the past two decades (Johns & Gratton, 2013).

At the end of the 1980s the first wave emerged and in the 1990s it was intensified, and it interrelated to the initial democratization of home personal computing , merged with email development which provided organizations some flexibility that was manifested within the development of telecommuting and telework (Johns & Gratton, 2013).

The second wave which was developed during the 2000s correlated with mobile technologies development and teamwork at a global level and consequently favored spatial and temporal dissemination of work which enabled employees to work anywhere, anytime reflected in the growth of mobile, distributed work and remotely performed work (Johns & Gratton, 2013).

The current development of “co-working spaces” has embodied the third wave of virtualization, which is defined by work that disseminated past private and professional spaces (e.g. the office). Information and Communication technologies provide workers with more flexibility for working in other settings beyond the office or home and therefore more workers choose to work independently. The emergence of new spaces dedicated to work characterizes co-working space which reflects a broader trend (e.g. train stations or airport lounges , rentals of space hourly suggested by WeWork or Regus companies) (Johns & Gratton, 2013).

All the developments as mentioned above in technology and consequently in the ways the office works done brought about the various approaches to the organization of the office spaces and their layouts. The layouts are discussed in detail in the following parts.

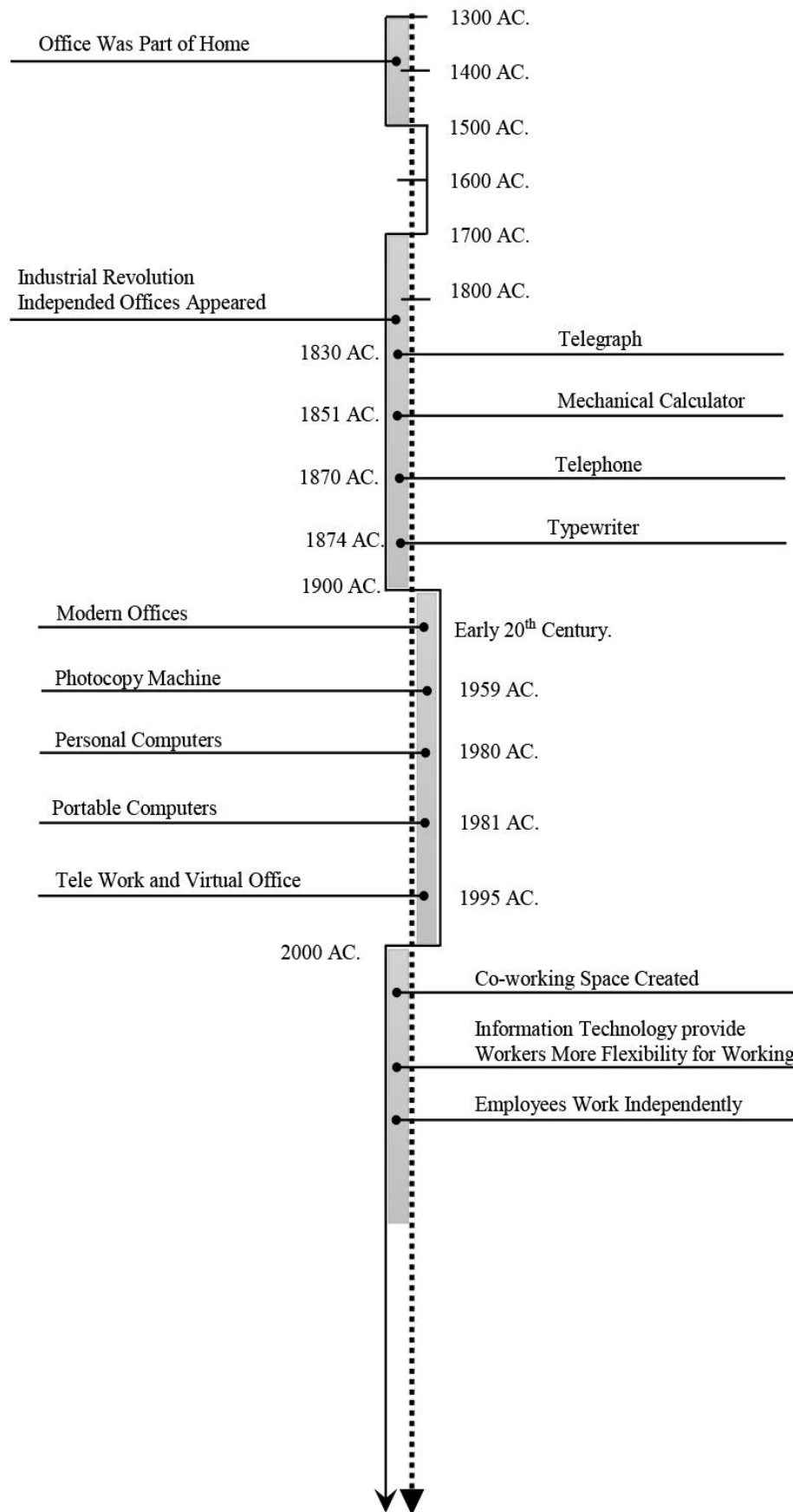


Figure 10: Office Technology Evolution throughout the History

2.2 Office Layouts

In the previous sections how development in technology changed office work and workplace was explained. Development in technology affects the way the office work was done and the way office employees communicate. This development resulted in much more crowded offices with much more complicated structures. That's why new approaches to the organization of office were developed. In this part, these office layouts will be discussed. This discussion is necessary to understand how new-age offices are different from their precedence.

2.2.1 Close Plan Office

Close plan offices are comprised of workspaces entirely covered by walls. The first office layouts of the late 19th century consisted of a set of closed rooms around an atrium. According to Hua (2007) a closed plan office entails four organized high raised walls connected to an entrance/exit door with one or more personnel working in the office (Hua, 2007).

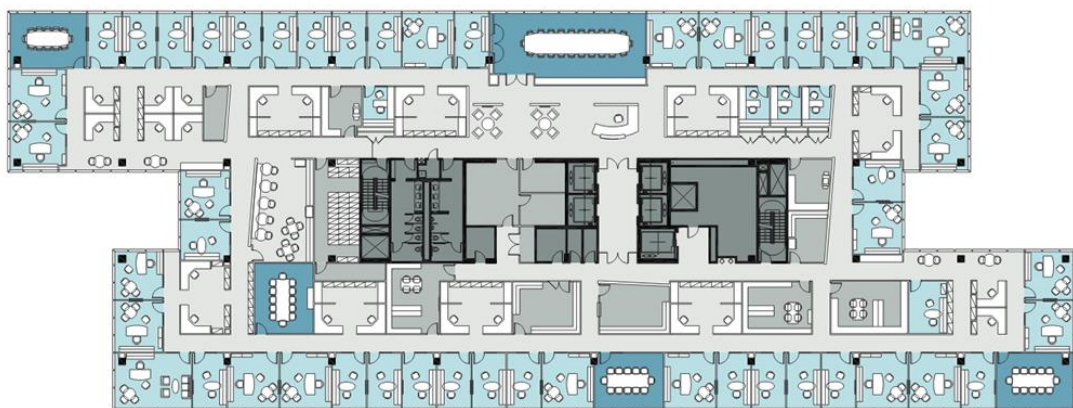


Figure 11: Example of a Close Plan Office (URL3).

According to Danielsson, and Bodin (2009) closed plan offices/cell offices are meant to be private working rooms that should only accommodate one person and they are

spatially private. The layout for the office plan should consist of the main corridors and installed windows for every office room. Office floor spaces larger than required areas could be divided into a few office rooms using a partition (Danielsson & Bodin, 2009).

According to Duffy and Powell(1997) , close offices are conducive for personnel requiring less interaction but more autonomy and can be used by distinguished professionals such as lawyers, managers, and accountants (Duffy & Powell, The new office, 1997).



Figure 12: Close Office (Becker & Sims, 2001).

In this type of office corner office rooms are usually allocated according to the rank of the employees in the company. Senior executives usually occupy corner offices boasting good windows exposure, solicited privacy and more often bigger total square footage (Kotlyarov , 2015).

Decreasing the cost of work environments and increasing the organizations' profit by making space more efficient play a big role in design of work environments. Also, workers had a serious problem related to interaction and collaboration at close plan offices (Hua, 2007). To solve this problem a new design of office layout was generated

which is called open plan office. The designers of open plan office types had a diverse perspective about organizational structure. In general, this term is used to describe a work environment which its main feature is the absence of walls between workstations. In the next section the characteristics of open plan office will be described in detail.

2.2.2 Open Plan Office

Open plan office is an employer's choice because of cost-efficiency, flexibility for changing in organization and communication and efficient workflow (Bodin Danielsson, 2008). But before going into details about the open-plan office it's better to know about Taylorism because the concept of the open-plan office is based on Frederick Taylor's ideas.

In the early 20th century (after the first World War), Frederick Taylor's contribution to management thinking called initially 'scientific management' or 'Taylorism' as it was described before (Duffy & Powell, 1997) led to the emergence of open plan layout scheme. Initially the scheme was adopted for factories but after gaining significant validation it was later picked up by different businesses (Grech & Walters, 2008). When technological devices such as typewriters, calculators, and telephones invaded the office environment, Taylorism became a suitable attribute for office work reference (Spender & Kijne, 2012). According to Duffy and Powel (1997), the main principles of Tylor's ideology portray dehumanization, reduced hierarchy, direct supervision and depersonalization. Taylor asserts that people were exploited for production and therefore the production was dehumanized. In the factories to deliver to the required deadline, workers were obligated to assemble simultaneously at the same place. Another Taylorist fundamental principle for management is supervision. Since employees/workers have a tendency to slack when they are not supervised, Taylor

asserted that robust observation needs to be applied to keep employees/workers from slacking. Taylor considered hierarchy to be very imperative in giving meaningfulness to the work environment and categorize workers according to their job description. According to this approach, in the office, workers/employees who are punctual, honest and committed are rewarded with a larger desk and some private space for working. Managers and supervisors had a privilege of their own private offices. Taylor's management ideologies (Figure 13,14) perpetuated conflict and contradiction in work environments (Duffy & Powell, 1997).



Figure 13: Taylorism Idea at Textile Factory (URL4).



Figure 14: Taylorism Idea at an Office Building (URL5).

Hua (2007) states that the first open-plan office layout emerged after the industrial revolution. Open plan office was a term to describe a working space without walls between work stations. Since the 19th-century companies primarily were driven to increase organizational benefits through maximum employee input and, implementing the concept of open-plan office to their working plan would have yielded better results. Companies were also in need of dozens of workers to deliver mass production, and therefore implementing open plan layout on their mandate would have guaranteed enough space to accommodate all the workers (Hua, 2007). According to Brennan et al (2002), an open-plan office can be defined as an environment in which people working together are physically located together with the geometry of the layout reflecting the pattern of the workgroups. Other areas could be segregated by plants, cabinets, some furniture, shelves and low moveable screens (Brennan , Chugh, & Theresa, 2002).

Open office layout became more popular and according to Taylor's proposal work was defined as an activity that each employee with minimum skills was able to do it. A

novel type of office layout was designed base on this organizational decision which is called the “Bullpen” or “Pool” office (Grech & Walters, 2008).

Bullpen Office

Since it was not expected from employees and workers to act in an inventive and independent manner, Taylor’s theory indirectly caused strict hierarchies. The employees were treated like inconsiderate and thoughtless automatons. They were strictly under the control of management and considered as unreliable elements. Therefore, the working process in such offices became somewhat machine-like. According to Danielson (2005), there was a large working space for regular office workers and it was under the strict supervision and control of management, so-called “Bullpens”. Open and large working places were preferred for routine office works, while more qualified office works took place in single office rooms. Insurance companies were among the most interested organizations in the “Bullpens”, regarding their high rate of routine based clerical work and female employees. The insurance company of Trygg was one of the earliest office buildings designed and planned in such style in 1910 by Erik Lallerstedt (Danielson, 2005).



Figure 15: Bullpen Office (Van Meel, 2000).

Grech and Walter (2008) also explain bullpen offices as: one type of an open office plan layout is “Bullpen” or “Pool” office in which rows of desks occupy the floor without any partition, thereby expediting employee collaboration and idea exchanges. The main focus of this type of office plan was to shed more focus on free flows of ideas and therefore unwittingly neglected employee comfortability and conduciveness (Grech & Walters, 2008). Even though the “Bullpen” office structure established in the early 20th century as the first sample of the open-plan office, the popularity of this idea and model was decreased in the US, because of the need for more flexibility, transparency, and maximum density (Grech & Walters, 2008).

In the middle of the 20th century, bullpen office layout was prevalently in use in the United States with installed air conditioning and fluorescent light in the office buildings. This type of office plan layout is still prevalent in some workplaces or some work environments and it's preferred by less complex job titles such as call centers as shown in figure 16 (Hua, 2007).



Figure 16: Bullpen Setting in a Call Center (Marmot & Eley, 2000).

As a result of new opinions about an organization's productivity, Quickborner Team-oriented a new approach during the 1960s in Germany (Marberry, 1994) which was called "office landscape."

Office Landscape

The office landscape presents a socially democratic workplace that stimulates all-rounded interaction and staff engagement (Rassia , 2017). From an organizational theory was born Bürolandschaft, because this concept subscribes to the complex scientific 'model' of 'human relations' instead of Taylorism. According to this approach, the regular arrangement of desks which was in parallel rows was rejected and they were placed in odd positions with asymmetrical arrangement instead. As a result, an expansive interior "landscape" was made (Pile J. , 1978) (Figure 17).

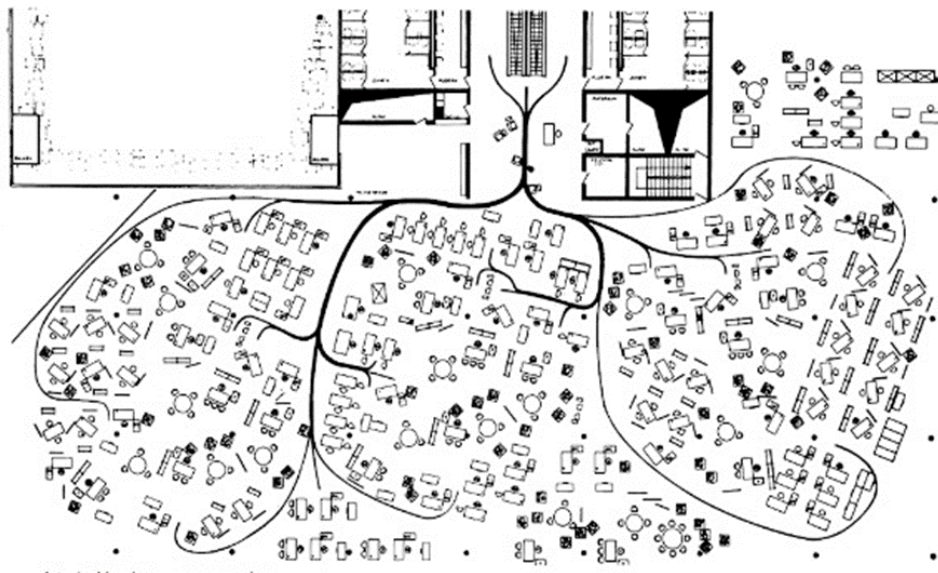


Figure 17: Bürolandschaft (Office Landscape) (Piotrowski & Iida, 2010).

An intensive study of patterns of communication was carried out between different organization parts and different individuals as part of the office layout. The Quickborner team put together some criteria that match a specific office to the specific

layout since there was wide recognition and acknowledgment for the diverse nature of office work. Desks were bunched together in different sizes in work zones, within the Bürolandschaft. The main intention was to deliver a human work environment that is collaborative (Kotlyarov , 2015). For this office layout, (Figure18) offices were not closed, furniture positioning angle was peculiar and spacing was irregular. To segregate some areas, large potted plants were employed on some office layout examples. The main intention was to facilitate a non-hierarchical environment for better communication as well as collaboration (Sundstrom & Sundstrom, 1986).



Figure 18: Bürolandschaft Workplace (URL6).

The first example of an office landscape project in United States was implemented in 1967 at the DuPont office in Wilginton. This kind of landscape brought rapid and low-cost changes in layout. It saves a significant space for people to use as well as reducing maintenance costs. But, there were also complaints about noise problems and lack of privacy for occupants (Sundstrom & Sundstrom, 1986). To render the needed ventilation, they used air-conditioners (Duffy, Cave, & Worthington, 2016) and to eliminate the hierarchical order and unite the staff, all the employees had to work within the same workstation regardless of the employee position or rank in the

company (Van Meel, 2000). Office landscape had developed in many variations such as using system furniture containing movable, interconnected panels with attached files and desks (Sundstrom & Sundstrom, 1986).



Figure 19: Office landscape Design with Curved Partitions to Make More Privacy, (Van Meel, 2000).

Cubicle and Action Office

According to Sundstorm and Sundstrom (1986), working at the open-plan office didn't satisfy employees because of noise and lack of privacy (Sundstrom & Sundstrom, 1986). In cell offices employees had privacy and they could control noises but in the open-plan office, they had a problem, so, to solve these problem furniture systems were designed. A distinct open plan layout called the "Cubicle" or "Panel Based Layout" emerged from the production and improvement of the 'Action office system' (Hua, 2007). Robert Propst designed the first furniture system called "Action office system,' and Herman Miller manufactured it. In other words, this corporation

happened in order to provide more privacy for workers with new office furniture (Marberry, 1994).

Action Office I included workspaces and desks of different height, which provided the movement freedom for workers, and the flexibility to get the most suitable working position regarding the task. Action Office I was ideally suited to small professional offices in which managers and employees often interacted using the same furnishings. The Action Office I was ideal for small-sized offices but, the cost of it was high and it was hard to assemble, and also was not appropriate for large offices (Habegger & Osman, 2005) (Figure 20).



Figure 20: Action Office (URL6).

Action Office II, on the other hand, was generated by Propst and Nelson as the next generation of furniture systems, due to the poor sales of Action Office I. Propst intended to provide the employees an amount of privacy, and personalized working

space without affecting the environment of the other workers who used the same place. Propst found that the degree of productivity is higher when people work in a territorial area where they can both personalize and have vistas outside of their own place. Propst concept was the “Back-up” that consists of a two or three-sided vertical split that made a territory and provided privacy without covering the view or decreasing the participation in actions happening outside the personal space. The basis of the Action Office II was a mobile wall unit which defined the space. Moreover, the mobile wall unit supported various workstation furniture according to the vertically oriented workplace. Equipment parts were not only easy to assemble and install but were also interchangeable and standardized. Furthermore, those components were flexible enough to let the company adjust the working space according to changing needs. In other words, the Action Office II series presented “cubicle” that refers to the concept of a flexible, semi-enclosed workspace (Leslie, 1998).

Generally, two types of cubicle existed “High-paneled cubicle” and “Low-paneled cubicle”. The height of the panel or screen of a High-paneled cubicle was such that a person was unable to see the section when sitting. On the other hand, in a low-paneled cubicle, the worker could see the top of the panel or screen while sitting. These partitions were supposed to form barriers that diminished the sight as well as the noise that might cause distractions for the workers (Becker & Sims, 2001) (Figure21).



Figure 21: Action Office with High Panel (URL6).

2.3 Combi Office

Mix office is a combination of open and closed offices. This type of office emerged to control the noise and to provide privacy (because in open-plan office workers had a problem with these two factors) but still provide the maximum amount of interaction and communication between the workers (Figure 22).

In Sweden, during the late 1970s, the idea of making an office-type which encompasses the advantages of both the open-plan office and the cell-office aroused. The shortcoming of the cell-offices was lack of space whereas the shortcoming of open-plan offices was the noise problem and lack of privacy. So, architect Svante Sjöman introduced “combi-office” as a new type of office in 1977.

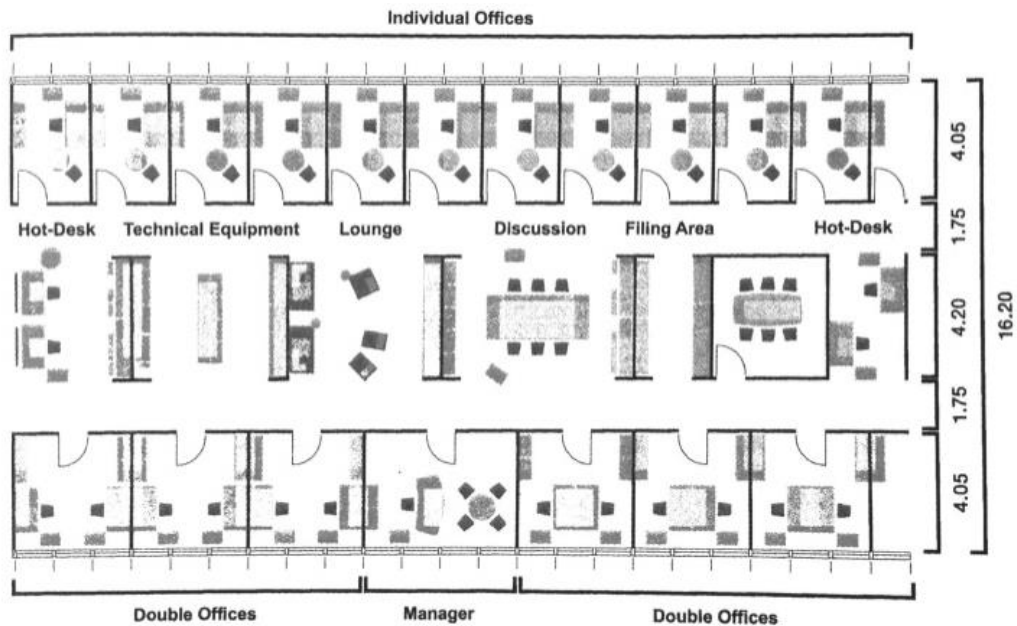


Figure 22: Example of Combi Office (URL6).

The first real combi-office was built in 1978. This very first combi-office was built for the Canon Company in Stockholm, by the architectural firm Tengbom. Norwegian architect named Niels Torp in 1988, designed the other famous combi-office building that was the head office for SAS Airlines in Frösundavik Stockholm. For a long time, this office building was considered as a good example of a well-designed office. Jan Carlzon, the CEO of the company was also involved in the building project. Initially, each employee had a private office with a glass wall to the outside corridor (Danielson, 2005).

In this project, on the other side of the room there was also a window looking to the outdoor area or to the “interior street,” which the entire building was built around. Out of the private offices, the corridors expanded to big “squares” made for public use which called “multi-spaces”. Having big private offices, large public multispecies, and an interior street increased the number of square meters for each employee. However,

to turn into more space and a cost-efficient structure, the SAS building (Figure 23) has gone through a number of reconstructions since the year 2000 (Danielson, 2005).

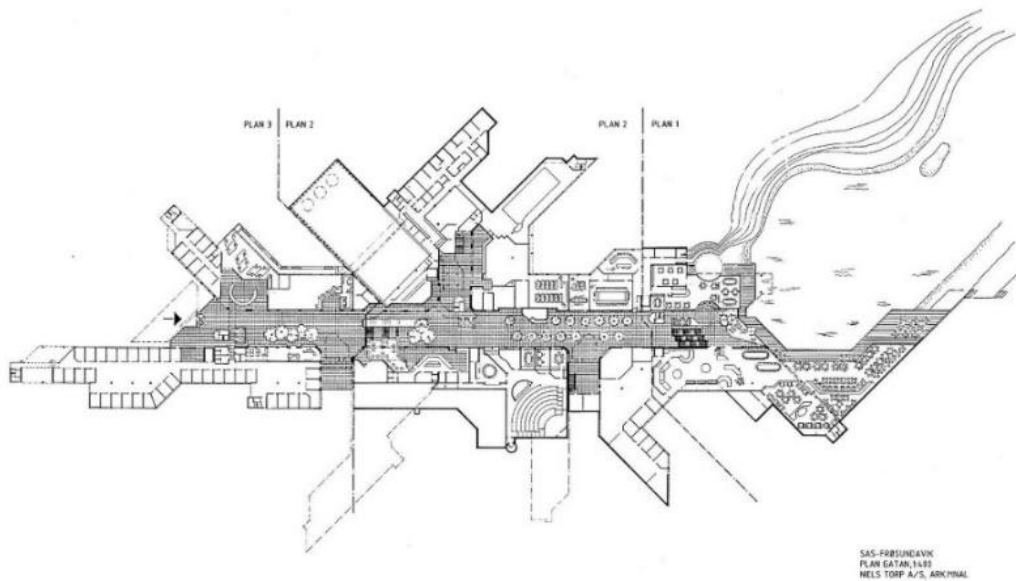


Figure 23: Photos and Plan of SAS Building (URL7).

2.4 Alternative Workspace Types

Before the 1990s, a large number of workspace spatial design solutions were developed according to a belief that workstations or offices belong to individual office workers. Hua in (2007), stated that nowadays numerous tasks could be done remotely, and as a considerable office time spent in meetings, therefore, individual workplaces

are not used for 45-50% of the time in an average of a normal working day (Hua, 2007).

Hot desking or free address is a situation in which office workers share workplaces by reserving unused desks when they need to work in the office environment. This situation is a result of teleworking and making the workplace standardized and more work digitized (Hua, 2007). In other words, the process of hot-desking ensures the company's mobile workers that they can find and use a workstation (such as any existed workspace, cubicle or office) in a fast and efficient manner when they need to work in the office (Asure softwaew, 2014) the result of such a solution is a significant advantage in space efficiency. For the employees who don't have an office for themselves, office hoteling is a good solution which helps them to share workspaces. In this situation, employees in office hoteling programs only use the office when it is necessary to collaborate with their peers and the rest of the time by reserve it before they go , they normally work from home (Hua, 2007).

In this chapter office history and different layout of office were explained briefly. This information is necessary to understand the characteristics of new-age offices. Table 1 and Table 2 below demonstrate a summary of "different types of office layout" and the "technologies that have been used in the office" work and have changed the office work and layouts.

Table 1: Concept & Design Strategies used in Offices

Office Types	Concept	Design strategy
Closed Plan Office	Private spaces Less Interaction More Autonomy	A room with walls and windows it can be used by distinguish professionals such as lawyer, accountants.
Open Plan Office	Making space more efficient Increase collaboration and interaction Increase flexibility	Walls removed all workers and equipment gathered in one open space.
Bull Pen Office	expediting employee collaboration and idea exchanges. Focus on free flows of idea.	Rows of desk occupying the floor without any partitions. Its good for less complex job titles such as call centers.
Office Landscape	Create a socially democratic workplace. Increase all-rounded interaction. Make more staff engagement	Furniture position angle was peculiar and space was irregular. Facilitate a non-existing hierarchial environment for better communication as well as collaboration.
Cubicle Office	Increase privacy Make movement freedom for workers Make suitable working position. Make territorial area. Make both personalize and vistas outside of their employee place.	Open space divided and workspaces created using partitions. System Furniture Such as Action Office Emerged
Combi Office	Control the noise Increase privacy	combination of open plan office and closed plan office control the noise and privacy keep the interaction and collaboration between employees.

Chapter 3

NEW AGE OFFICES

In the previous chapter, different types of offices and how they changed in relation to the technologies used in the office and complexity of office works was discussed. In this chapter the characteristic of new-age offices and the differences between work in the 20th and 21st century will be explained.

Becker & Sims (2001) believe that with the progression of the 20th century, people working in the office became interconnected and shared spaces and work in an open-plan office using specialized equipment (telephones, typewriters and computers, copiers and printers). They also gathered in order to share information and to socialize, and also to be monitored to ensure they were doing their work. The prevalence of panels that create private environments for stuffing up or down the organizational hierarchy emerged between the late 1950s and the early 1960s. Rank and file staff were expected to work independently in a place created by organizations to become productive 'on task.' Physical barriers in the form of panels hindered socialization amongst workers and thus replaced supervisors. This also hindered making office acquaintance and smooth information sharing between co-workers. But employees need more communication and interaction so after a while, the panel's height became less to increase face to face communication, and then gradually they were removed again from office space (Becker & Sims, 2001).

Becker and Steele (1997) express their new idea about the office in the 20th century saying that “The workplace is not simply one’s desk, office, or workstation in an office building. It is also the cafeteria, the conference and break rooms, the project room, corridors, and water fountains, the fitness center. It is all the places in which one works . . . organizations need to conceive the workplace as a system of loosely coupled settings that are linked by the physical movement of people and the electronic movement of information in a way that enhances the organization’s ability to meet its fundamental business objective” (Becker & Steele, 1997, pp. 14-15).

But in the 21st century, according to Henderson and Mays (2003) the focus of the office has been shifted further by incomprehensible advances in technology. Using modems and other high-speed connections we have the ability to access information virtually anywhere, at any time (Henderson & Mays, 2003). These changes bring more mobility and flexibility for office work. U.S General Service Administration (GSA, 2003), defines innovative workplaces as the process of integrating business processes and individual work practices with work strategies and office space which results in workplace solutions that are healthy and high-performance. The term ‘new workplace practices’ closely associates with workplace innovation or business organization innovations and work processes, which involves new ways of working and flexibility at work such as flexible work arrangements and flexible scheduling (Van der Voordt, 2003).

As workplace layout and organization changed in the 21st century, the new term “knowledge worker,” has become more common to use. Knowledge workers are scientists, physicians, pharmacists, design thinkers, engineers, programmers, architects, public accountants, academics and lawyers whose main capital is

knowledge. And also white-collar workers, whose line of work requires one to "think for a living." This term first was used by Peter Drucker in his book (The Effective Executive) in (1959) then in 1999, he said that knowledge workers and their efficiency are the most appreciated wealth of a 21st-century institution (Drucker, 1967).

Duffy, Cave, and Worthington (2016) express their idea about working in 21st: Knowledge workers of the 21st century carry out their ubiquitous networked information work within networked offices. Additionally, the use of technological connectivity in the networked offices got rid of the conventions of the 20th-century work. In accordance with this concept, workplaces can easily be identified within multiple places and organizational boundaries are extinct. Besides, in the 21st century, there is extended automation of most individual tasks and they can easily be carried out anywhere besides the office. This means that the networked offices 'communal rather than solitary characteristics,' 'happy accidents' rather than planned encounters and meetings (Duffy, Cave, & Worthington, 2016).

Over the past century, the most significant shift within the workplace has not focused on where or when one accomplishes something but on what one does or accomplishes something. Therefore, the necessity for an office today is gathering people together so they socialize and exchange information, inspire progress and provide progress feedback. Because the advancement of information technology brings flexibility and mobility for the employee so they meet each other less than before and most of their communication is virtual communication.

In the following section, features of new-age offices will be discussed. These are divided into two parts. The first part is about the new concepts that are emerging in

new age offices and the second part will be related to the spatial characteristics of new-age offices developed according to emerging concepts.

3.1 Change in Office Concept

The image of working at a classical office or workplace that workers should attend to the work and left it at a special time have been changed totally. In the New-age offices work and layout are different than the classical ones. Since using wireless internet and wireless devices such as laptops, tablet or smart mobile phones become popular, the way that people collaborate and work with each other has been changing. The employee can work together virtually and they can see each other with video calls at any time and this makes their job easier and faster. William Mitchell (2004) asserts that today since much of an individual's work is carried out through the means of technology such as laptops and cellphones, there's no need to go to work (Mitchell, 2004). So, is there ant need for office in new-age ?

The utilization of technology in the 21st century has rendered most of the patterns of work such as face-to-face supervision and paper file usage as well as archiving obsolete. In this information technology era of today, knowledge workers frequently engage in virtual communications as collaboration is not only limited to face-to-face communications (Laing, 2013). Although there is no need for physical interaction and collaboration between employees, still many companies believe face to face interaction and collaboration is more effective than virtual communication and they try to change their office layout to keep their employee at the office. They believe face to face talking helps employee to improve their ideas better and also it makes the office environment more friendly.

In the new offices space opportunities to let worker to interact for instance in order to enhance chance encounters and facilitate informal interactions between employees working in different parts of the organization, in many companies office spaces are designed with shared kitchen areas and spaces for relaxation (Boutellier, Ullman, Schreiber, & Naef, 2008). There's strong importance put on employees being present in the office daily because face-to-face communication is considered paramount, regardless of the ability of employees to engage with each other through virtual communication (Collinson & Collinson, 1997). The chief HR (Human Resource) office at Yahoo justified their homeworking ban through unleashing a report which stated that in order for their workspace to become absolutely the best space to work in, communication and collaboration are vital, therefore it's essential that they work physically together. Thus, there's an absolute need for their presence in the office (Arthur, 2013). In the new-age offices, the primary function of the office with different routines work and limited levels of interaction has changed radically. Consequently the spatial quality needed is changed as well. In the light of the new definition of office work a new approach to office space design is needed.

3.2 Emerging Concepts in New Age Offices

To be able to design a proper office layout and to design a proper environment interior designers should know about the new strategies and concepts emerging in the today's office. There are several concepts that directly affect the way new offices are designed so before beginning to write about the design of offices is necessary to explain about the new concepts emerging in the office.

3.2.1 Managerial Organization in New-Age Office

As the office layout and office work are changing, the structure of managing and organization of the new-age office also has changed. The traditional hierarchical model

(Figure 24) of management has been utilized in various offices since the industrial revolution. The way of arranging individuals of an organization in the hierarchical model is based on the power. In other words, the layout of a hierarchical organization is pyramid-shaped. Except one person that is mostly called CEO, each employee in the organization is subordinate to another one. According to Morgan, the layout of a hierarchical organization contains several entities which are descending to the base of staff-level employees sitting at the lowest section of the pyramid (Morgan, 2014).

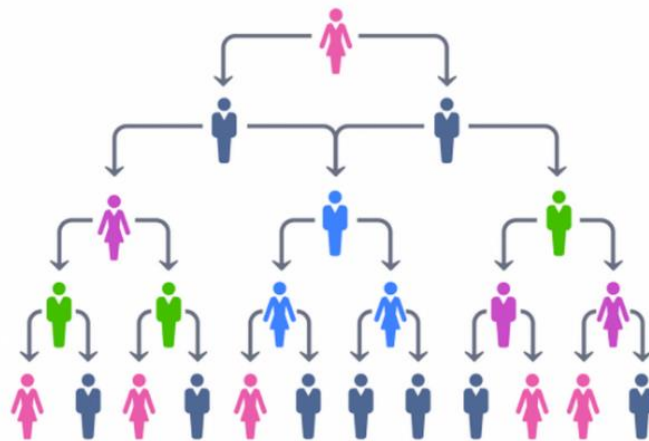


Figure 24: Hierarchical Organization (Morgan, 2014).

But the traditional system was not working for new-age offices and knowledge workers. So the flat organization system comes instead of hierarchical management and organizational. Traditional organization has a management system that its main focus is on the planning, accounting, organizing, controlling, and ordering processes. Flat organization (Figure 25) on the other hand, has a leader that establishes directions and guidelines, arrange people, encourage, motivate, and make change (Morgan, 2014). Therefore, the notion of employee empowerment is supported by such differences.

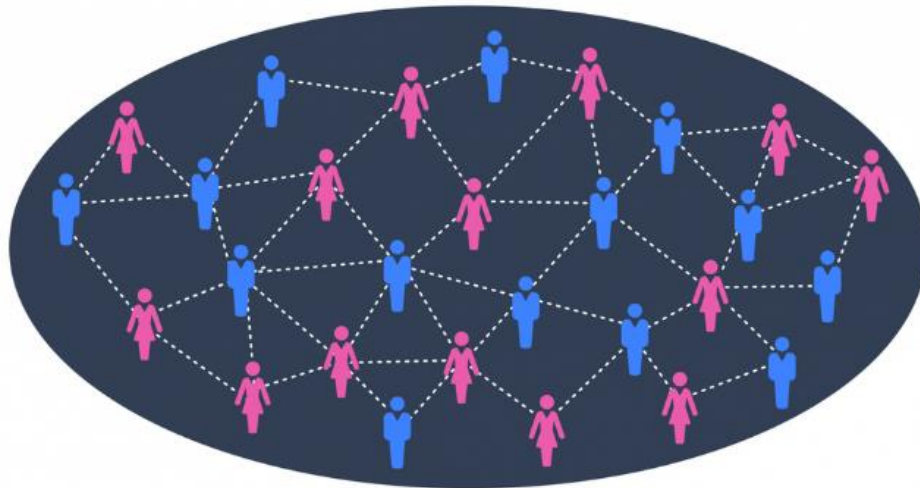


Figure 25: Flat Organization (Morgan, 2014).

3.2.2 Employee Empowerment

What is changing in today's office is not only technologies used but also the type of office worker and the way they management has changed. During the 20th and 21st century, since the knowledge workers are the actual drivers of the businesses, the industrial organizations focus more on them, and it make an increase in their number (Kumar & Kumar, 2017). Even though there are several ways to describe empowerment, but most writers are agreeing with the fact that the basis of empowerment is employees given discretion about specific task-related activities. According to Randolph (1995), employee empowerment is a power exchange that is transferred from the employer to the employees. Blanchard et al. (1996) also stated that empowerment has a higher level of responsibility and accountability as well as the freedom to act. Therefore, it is obvious that if a management system gives more empowerment to their employees, it will make them more motivated, loyal, and satisfied while assisting the organization in achieving its goals. In this regard, empowerment helps to make employees more independent and allows them to share the responsibility and power in every level. Empowerment also creates the employee self-esteem and boosts the workforce for a better performance. Empowerment

increases the employees' degree of confidence and such extra confidence creates not only job satisfaction but also high levels of productivity (Kumar & Kumar, 2017).

Universal Design

Proper workplace design helps employers attract and retain the best people from a diverse workforce. Attain the maximum level of usability in the space enhances overall work efficiency, employee morale, productivity, and public safety. In brief, a smart place of work design improves the quality of work-life (Levine, 2003).

The purpose of universal design, known also as “inclusive design” is to count all employees in the organizational workplace. Its principles can guide the design of policies, environments, processes, tools and technologies to ensure the integration of all workers into the place of work. The global design can optimize productivity, safety, teamwork, and communication for all employees (Imrie & Hall, 2003).



Figure 26: Office in Denmark with Different Organization for Disabled People (URL8)

Inclusive design not only ensures that if a worker is disabled, it similarly plays a role in reducing work-related injuries (e.g. repetitive motor injuries) and enhancing general

worker productivity. Inclusive workplace design includes providing basic accessibility to work settings, flexibility in the public environment, and choosing office furniture and equipment that can be customized to suit a variety of needs and tasks (Levine, 2003).

Elements of the public surrounding contain electric and lighting control, doors and partitions and acoustic. These elements are usually not removable or adjustable after the building process has finished unless they are initially designed for flexibility. Of particular concern today in the design of the workplace are wheeled mobility devices of different types. Many people need to use a scooter to reduce energy costs during the day. Although they may be able to stand and walk short distances, this scooter allows them to be fully mobile. As the workforce ages, the use of scooters will increase significantly. The figure 27 shows the Linked In office in Canada. Employees use the scooter to pass the halls very fast, from meeting to meeting (Levine, 2003).



Figure 27: Using Scooter at LinkedIn Office in Canada (URL9).

This concept is vital for today's offices because it supports emerged concepts such as fit to the environment, flexibility, health and employee empowerment, which are mentioned in the following part of this chapter.

3.2.3 Flexibility and Mobility

Flexibility and mobility are two concepts that are appeared in the workplace after the emerge of computers and wireless internet and devices. The reality of work today is enhanced by cellphones, laptops, tablets, wireless networks and web meeting tools. Workers are influenced by these technologies to deliver the necessary work because through their possession; they feel the flexibility to choose where and when they can do their best work (Johns & Gratton, 2013). The main influence of this scenario is that traditional methods of working are not suitable for the environment of knowledge workers with changing demands.

Flexibility is a concept that always could be seen in different types of open-plan offices, and it is one of the reasons which makes open-plan offices popular. According to the oxford dictionary (2015) there are different definitions of flexibility. One of them is “the ability and /or willingness easily modify, change or compromise”. Another definition of flexibility is “the quality of bending easily without breaking” (Oxford Dictationary, 2015). An important aspect of flexibility that may be inherent to assumptions organizations may have concerning workplace flexibility is incorporated in the latter definition (Kelliher & Anderson, 2010; Putnam, Myers, & Gailliard, 2014), which entails the willingness and ability to bend without breaking. This is closely tied to the ability of employees to work more hours motivated, carry out more tasks and easily adapt to the performance of more roles within the organization (Way, et al., 2015).

Two particular perspectives arise from translating flexibility to the workplace. External control can actively be exercised over one's work by utilizing flexibility to enable workers to reduce or rebalance workload. In new office workers use flexibility to align their jobs with their personalities, thereby actively shaping their jobs (Kooij, Kanfer, & Tims, 2014).

In many new age offices working hours don't have meaning for the employee because they have flexibility at their time and employees can distinguish their start and finish times. Some employees work part-time at the office and some of them are coming to the office, for example for 3 days and stay at the office at night and finish their work then the rest of the week they do their own work (Clarke & Holdsworth, 2017).

Mobility is another concept that has an effect on employee's work. According to Wagner and Watch (2017) while great variation exists on the level of technology found in innovation spaces, technology, on the whole, is influencing office behavior, creating patterns of work that are less obvious or predictable. One clear example of this is how technology has increased the overall mobility of workers, enabling them to work from various locations and still be "plugged in" (Wagner & Watch, 2017). Mobility is often used (at least in the US) as a catchphrase in reference to diverse programs developed to manage or accommodate telework, telecommuting, hoteling, free address, flexible seating, etc. This includes external mobility – working from different locations outside the office – and internal mobility – interchanging between individual and collaborative work range settings within the office (Acoba, Baker, McNamara, & Meyer, 2012). Mobility has different types in today's offices such as:

- Telework: Employees work from home, connected to work by mobile technologies;

- Remote Work: Employees work anywhere, coming to the office as needed (Acoba, Baker, McNamara, & Meyer, 2012).

These mobility characteristics that are mentioned above are more popular in new age offices because the employees may prefer to do their work from different places at different times. Some people work for a company that is located in another country or city and by teleworking or remote work they can do their job easily.

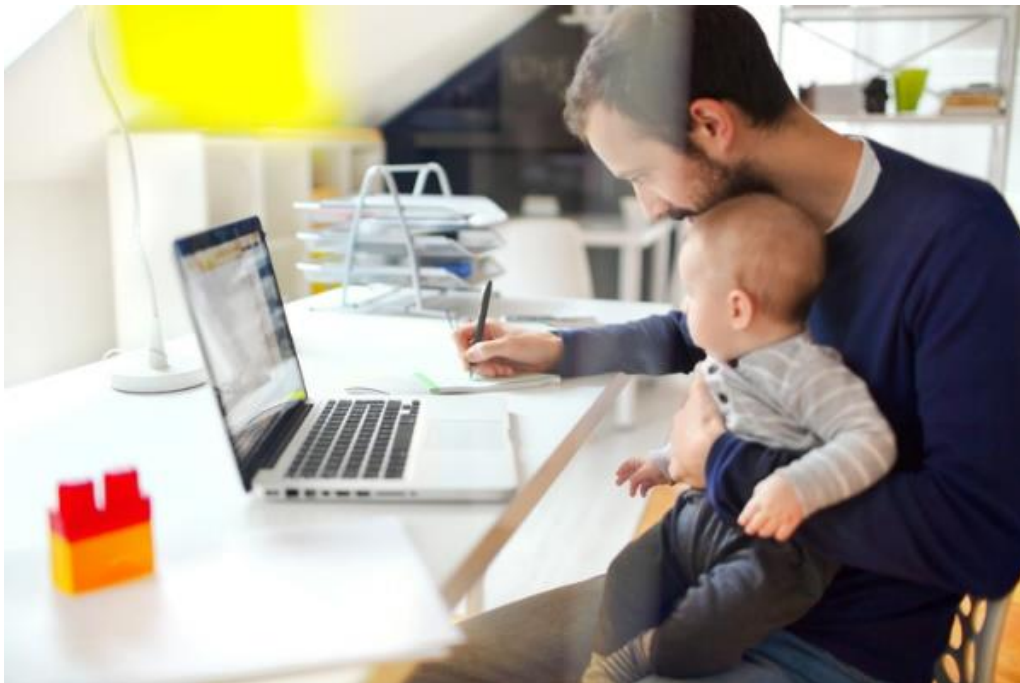


Figure 28: Working at Home (URL24).

3.2.4 Collaboration and Interaction

As explained in the literature review open-plan office layout became more popular after cellular office due to some reason that explained before and lack of interaction and collaboration was one of them.

Due to developments in technology the need for face to face interaction and collaboration has become less but as Igbaria and Tan (1998) mention communication

is essential in any organization. Individuals have the privilege of long-distance communication through modern-day organization technologies such as e-mail, conference calls and, web-based meetings (Igarria & Tan, 1998). Using these technologies is useful but it limits face to face interaction. Since communication and face-to-face interaction within the workplace is crucial to outcomes such as productivity, job satisfaction, and commitment to the organization, these result in potential problems (Wolfeld, 2010).

Face-to-face interactions like informal communication and impromptu interactions likely affect productivity, job satisfaction, and organizational commitment although face-to-face interactions that occur in formal collaborative relationships (e.g., work teams) are also important to productivity. Campbell and Campbell (1988), defined informal communication as “relatively unstructured information exchanges that tend to occur in face-to-face encounters during ‘off-task’ moments” (p. 212). Employees’ sense of belonging can be increased and their work performance can be enhanced and also their identification and commitment with the organization can be increased through all these seemingly trivial interactions (Campbell & Campbell, 1988). Likewise, Rashid, et al. (2006) claimed that informal communication is often perceived as a method of strengthening “organizational culture”, interpersonal relations, and information sharing (Rashid, Kampschroer, Wineman , & Zimring , 2006). When the interaction is informal instead of being formal, information spreads more efficiently and faster (Davis, 1984). Informal communication takes place within impromptu or unplanned interactions. The combination of identification with the organization, the perception of the cost of leaving the organization as well as the obligation to stay with the organization makes up the concept of organizational

commitment (Allen & Meyer, 1990). An increase in the probability of employee interaction increases teamwork probability although interaction density may not have a straight effect on the productivity of an individual. Through teamwork, there's a better chance of capturing and retention of information (Kirschner, Paas, & Kirschner, 2009) and this contributes to higher productivity within the organization (Strubler & York, 2007). Despite the lack of any accepted academic definition of co-working, it implies a new form of work organization that enables collaboration chances and encourages a sense of community inside a communal space, gathering together workforces from diverse companies or even freelancers with different profiles and objectives (Johns & Gratton, 2013).



Figure 29: Face to Face Collaboration (URL24).

A notable transformation has occurred due to the new type of work organization, that changes working spaces and the way people work and cooperate. Collaboration largely involves two or more individuals who work towards a similar goal of producing a

novel product (e.g. an idea, solution or insight) which is beyond what they could have achieved working individually, it is not simply an interaction between two colleagues (Oseland, 2012).

The notion of collaboration can be defined as a process which happens when a group of independent stakeholders of a problem area involves in an interactive process, by common rules, standards, and structures, in order to perform or decide on the matters about the area (Wood & Gray, 1991). More recently, activities such as sharing information with others, crafting strategic planning documents jointly, searching for effective ways to synchronize business operations with vendors without being compelled to acquire additional business are emphasized by the entails of collaboration (Singh & Power, 2009).

According to Cisco (2015) Offices have become collaboration centers from which individuals and groups can come together to explore and share their ideas (Figure 30). This means that designing and building an office should not be oriented only on utilizing aesthetics and contemporary furniture to lure top talent, it should take a different approach. Offices that bring technology and people together so they can produce the best work are functional tools that are successful. It is necessary to utilize collaboration tools to bring people together in order to expedite the decision-making process and assist in executing innovative ideas simultaneously reducing operational waste (Cisco, 2015). New types of collaboration named virtual collaboration emerged when information technology developed and using wireless internet and mobile devices become common. According to Oseland (2012) The latest technology that facilitates virtual collaboration, through video-conferencing suites of face-to-face simulation, delivers better quality than its predecessors and has become much

affordable (especially when having to consider savings in travel cost, time and carbon). The advent of new smaller-scale personal technology such as Skype on laptops and FaceTime on phones assert that elements of virtual communication enabling face-to-face meetings are freely available anywhere, anytime for one-on-one interaction (Oseland, 2012).



Figure 30: Working and Collaborating at Cisco Office in San Francisco (Cisco, 2015).

Organizations today can easily gather remote workers into virtual teams to perform a variety of tasks through Collaborative Technologies (CT) (Samarah & Tadisina, 2007). All over the world, businesses and fellow employees have the capability to connect with each other, exchange data and conveniently work on projects of their own interest. Collaborative Technology shares information through the use of the internet or another form of technology. If implemented correctly, these Collaborative Technologies have the capability to eliminate face-to-face conversations and boost productivity. A skill known as collaboration know-how has to be possessed by employees collaborating with each other and they also have to understand the technicalities of the system. The ability of an individual to communicate their ideas

and mix them with ideas from group members so as to increase the success of the team is referred to as collaboration know-how (Zhang, Venkatesh, & Brown, 2011). Recently, new innovative forms of Collaborative Technology have been created through the contribution of IT. According to Samarah & Tadisina, (2007) examples of collaborative technology being utilized include:

- Mobile Phone;
- Video Conferencing;
- Emailing;
- Instant Messaging.

The way in which workers interact socially can be influenced through Collaborative technology. Systems that support virtual team group work are known as Group Support Systems (GSS). Two forms of support are provided by Group Support System namely “Communication Support” and “Process Structuring Support” (Samarah & Tadisina, 2007):

- A program that enhances collaboration between team members is known as a Communication support. This includes emailing, online chat forums, and instant messaging. One of the most prevalent forms of GSS in the business world today is “Communication Support” (Abegg, Butler, & Witsman, n.d);
- An agenda for employees as well as the due dates for work submission is provided by Process structuring Support (PSS) (Samarah & Tadisina, 2007). One example of PSS is the Smart sheet. It is used by employees in virtual teams as a project management tool. Various types of work can be tracked and managed by employees including team projects, to-do lists, customer info, sales info, lists of events, and business methods (Mishra & Mishra, 2013).

Someone who is a remote distance away can use Collaborative Technology (CT) to interact with the user and give the impression of the user “real-time” interaction. Employees of any organization can use opportunities created by Collaborative Technology to interact with each other without their presence in the same classroom. (Abegg, Butler, & Witsman, n.d). Communication will become easier and cheaper through virtual world collaboration. In order to save time and resources, virtual technology should be used by all departments within a company from accounting to human resources. Employees can maintain personal efficiency at the same time reduce turnover of the company since they can communicate from different locations without being present with each other in either any of them (Abegg, Butler, & Witsman, n.d).

Collaboration and interaction are both having an important role in today’s offices. After the advent of technology, it’s become faster and easier because of the virtual world. It helps employee empowerment because they can collaborate and share an idea from different places and different times. Even they can have virtual meetings at night after office time.

3.2.5 Employee’s Health

Employee’s health is another concept that has attracted the attention of companies in recent decades. One of the important issues in human resource management and employer-employee relationship, is health, safety and welfare of the employee (Hagelstam, 2017).The importance of the employees’ perspective is obvious, but also the employer gains from regarding and supporting employee wellbeing: healthy and productive personnel is one of its most valuable assets. Wellbeing at work (WBW) means healthy and productive work by competent workers who feel their job is meaningful (Finnish Institute of Occupational Health., 2016).

Nowadays, with regard to the economy, companies face a constant increase in competition. So, for long-term survival, it is important for a business to have continuous development, improvement and innovation. However, such a trend is mostly relying on the people and their skills, competence and interactions in the organizations. Supporting the welfare of employees and groups can lead to this change. An employee who is healthy, competent and inspired is more concentrated on the goals of the company (Hagelstam, 2017).

Hagelstam (2017) states that wellbeing at work affects the competitive advantage of organizations in several ways. It reduces the expenses related to sick leave, occupational accidents, and works disability. This also affects productivity and effectiveness in a positive way. Wellbeing at work automatically increases motivation and improves workplace atmosphere, which leads to betterment in service level as well as quality and customer satisfaction. (Hagelstam, 2017).

New age offices have some concept for worker's health, such as flexible working hours at the office and remote working. For example, when a person feels not good, he or she can stay at home and do his/her work from home. This opportunity increases the worker's ability and productivity. Another concept about worker's health is serving free healthy food and fresh fruit because it prevents their sickness. Many companies also have some spaces such as gym, spa or yoga classes to take care of employee's health which will be discussed in the next part.

3.2.6 The Fit Between Person and Environment

The fit between person and space is a concept that is highly considered today, especially in the new-age office layout because it is a psychological term that has a relation with employee efficiency. In the realm of organizational psychology, the fit

between different personal characteristics and the environment has been of significant interest. The basic foundation of person-environment fit is made up of the alignment of employee characteristics and the work environment, which triggers positive outcomes such as satisfaction, commitment, performance, adjustment, and reduced stress which can become beneficial at the individual level. In disparity, the effectiveness and long-term survival of the organization will be affected by the negative outcomes originating from a poor fit (Oldham, Cummings, & Zhou, 1995).

Researchers with the interaction perspective studied fit from the “macro-level” or from an interactionist perspective before they focused on the person-environment fit. The macro-level focuses on the relationship between the environment and organizational effectiveness and is associated with internal and inter-organizational design. The focus at the macro level for example was directed towards organizational strategy, structure and internal processes (Ostroff & Schulte, 2007; Schneider, Goldstein, & Smith, The ASA framework: An update, 1995). The interactionist perspective accentuates that an individual’s response is not primarily determined by a situation nor traits and the behaviors, attitudes, and cognition of individuals could only be understood within the context of two people interacting (Ostroff & Schulte, 2007; Pennings, 1975). However, interactionism does not signify how generating positive effects could be influenced by the interaction of personal and situational or environmental aspects (Schneider, 1982; Terborg, 1981). Hence, there’s a link between higher job satisfaction and productivity which is made up of a better fit between the individual and the organization, between the individual and concentration demands of the job, person and person, and between groups and organizations (Kristof-Brown & Jansen, 2007; Su, Murdock, & Rounds, 2015).

Office type is another dimension that interacts with job type and person on the results of health and performance whereas fit theories are mostly associated with the fit between the work organizational aspects and the person (Ashkanasy, Ayoko, & Jehn, 2014). The basic premise is straightforward. Depending on the spatial design and functionality of the office, the performance and health may differ based on who you are and what do you do. To measure this fit, some aspects pertaining to certain characteristics of the environment need to be taken into consideration, such as noise, lighting conditions, ventilation and the amount of space available per employee or by focusing on the total physical design of the office environment and ways of working. Depending on person-related characteristics, different office types will fit different individuals according to individual differences. Characteristics that are person-related include previous experiences and age, personality, needs that arise from certain disabilities or health problems such as physical and hearing disabilities. For instance, in an open-plan office people with hearing problems might experience a challenge in hindering noise compared to the unimpaired (Jahncke & Halin, 2012) in a cell office. Cell offices with many doors, doorsills and narrow corridors may inflict a personal challenge on people with a physical impairment.

New age offices by considering some simple concepts try to make more relations between employee and office environment. For example, using glass walls to invite natural light to the workplace interior, and also, it gives employees more energy. Or by adding some facilities such as free meals, fresh fruits and lots of various foods make worker's minds free about cooking times. Another example is a variety of spaces in new offices for working. Among private rooms, shared rooms or open work spaces employees can easily decide about the types of space that they like to work.

3.3 Spatial Characteristics of New-Age Offices

The new emerging concepts have not only changed the type of work and process of working in the office but also the spatial organization, layout and interior design of new age offices.

In the new-age offices as was mentioned in the previous section, office structure has become a horizontal system instead of the hierarchical organization and these changes are due to how employees are treated and employee empowerment have become more important than previously. All these changes have brought about the need for a new approach to the office interior design which supports the concepts that were mentioned above. In this part, different spatial features of new-age offices are discussed in detail.

3.3.1 Flexibility in the Office Spaces

Today's offices have different types of space for working to support flexibility. The concept of flexibility in an office can be truly possible only by having a flexible office space. By different types of mobility work such as telework and remote work employees prefer to work in different places that they can do their job easily. So companies try to change their interior space and layout. They use a mixed layout and add some facilities to the workplace to make employees satisfied. Flexibility in spatial design is an important factor for new offices because it also supports concepts such as fit to environment and employee empowerment, which were mentioned in the previous section.

Flexibility allows for multiple diverse work environments that can be altered and reconfigured as needed. Therefore, the office provides multiple rooms that suit each individual's personality, work style, and job position, such as meeting and conference

rooms, huddle rooms, lounges, private offices, silent workroom, and it is possible to reconfigure the rooms or the furniture in the rooms as the company or even the employees change or grow (Camenzind & Ruegg, 2015).

According to Taylor Landis, who is the lead content marketing and cubicle specialist for Skutchi Designs flexible office spaces are also extremely cost-effective. Instead of spending the time and money to redesign the entire office after a failed floorplan, company relocation, or growth, the employer can change the layout by themselves. In a flexible office space, employees can do their work in a private office, nook, cubicle, or silent work area or simply separate their self behind a partition or room divider, and when they feel a little bit too distant from reality, they could transfer their workspace over to a lounge or a group area (Landis, 2018).

In August 2019 Wework design company shared a list of spaces that make offices more flexible they include small private space, café with hot-desking, restaurant-style booths, formal conference rooms, informal conference rooms and quiet nooks for charging workers mind and body and outdoor space (Papandrea, 2019). For example, private spaces can be used by an employee who needs a silent place for focused work requiring concentration (think writing or data-crunching); they can stay in a private space some examples of such as private spaces are demonstrated in figure 31,32 and 33 (Papandrea, 2019).



Figure 31: Small Private Space in China (URL10).



Figure 32: Small Private Space at Google Office (URL11).



Figure 33: Accenture Office at London (URL12).

Another space that is very popular at new age offices is a restaurant or cafe-style atmosphere with hot desks. Sometimes these spaces are more crowded than formal working space. Figure 34 shows the variety of furniture such as semicircle booths for small group chats, long work desks or coffee-table areas made for a perfect blend of seating options at Yeouido Station in Seoul. Even there is a stage for informal presentations (Papandrea, 2019).

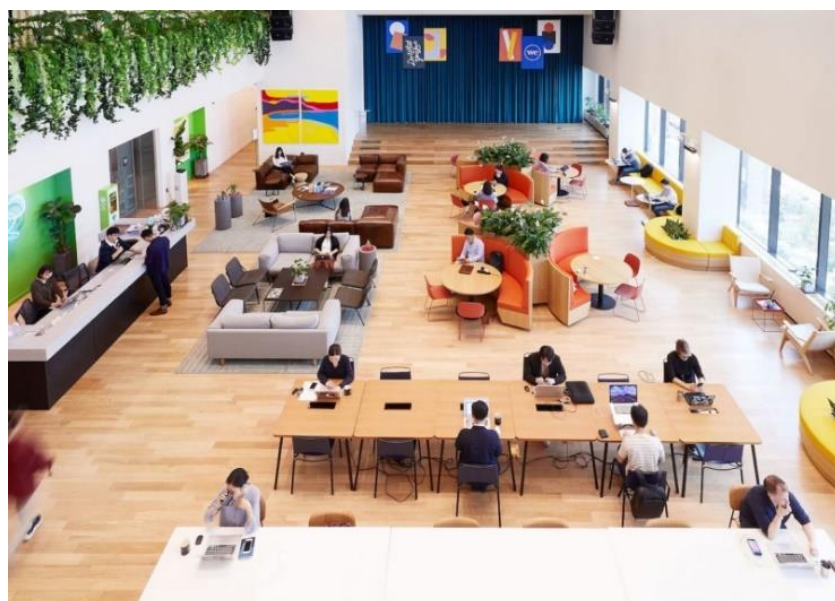


Figure 34: Cafe at Yeouido Stationoffice in Seoul (URL10).



Figure 35: Office Workspace at Thailand (URL13).

Lounges are other popular spaces in a new-age office. According to Wagner and Watch (2017), lounges have become an important locus for human interaction with various types of seating, a myriad of color combinations, patterns, textures and light fixtures, which are inspirational. The inherent flexibility of these spaces makes up part of their charm and vitality. An architect in Hacin and Associates, Matt Arnold, the designer of District Hall in Boston asserted that “sometimes this space is an office party. Sometimes it’s filled with people on computers. Sometimes it’s a mix of things going on at once. I am continuously amazed at how much this space can be transformed” (Wagner & Watch, 2017).

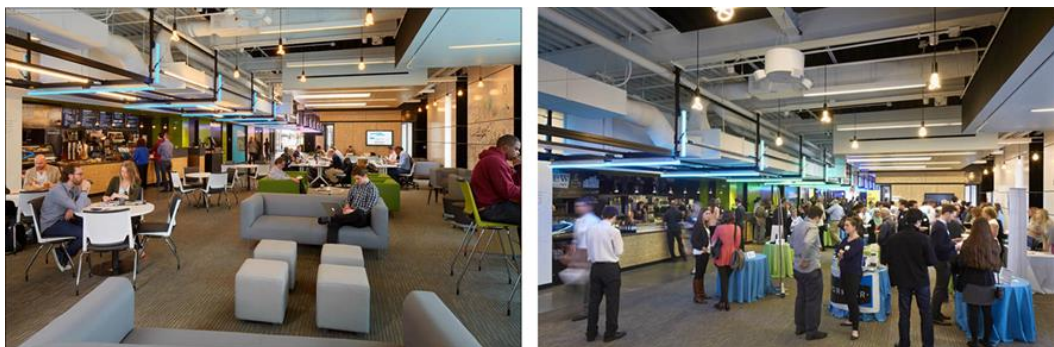


Figure 36: District Hall in Boston (Wagner & Watch, 2017).

The dinner booths style is a good solution for quick face-to-face collaboration with a colleague instead of virtual communication (Papandrea, 2019). Figure 37, 38 and 39 show different examples of this approach used in various offices.



Figure 37: Taohui Xintian Office in Beijing (URL10).



Figure 38: Restaurant-Style Booths at Google Office (URL14).



Figure 39: Restaurant-Style Booths at Facebook Office (URL15).

The formal meeting room in an office with a formal setting is necessary for meetings such as sales meetings, monthly brainstorms or executive strategy sessions. As the example in figure 40 shows, transparent walls and huge windows can let natural daylight cover many spaces at the office (Papandrea, 2019).

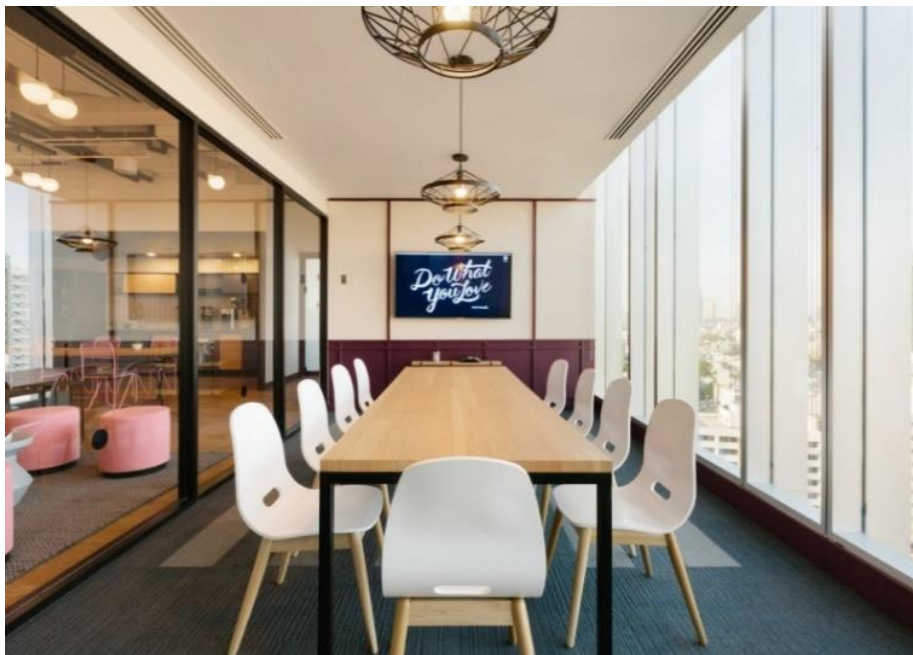


Figure 40: Conference Room at Insurgentes Sur 601 in Mexico City (URL10).

Informal meeting spaces, (Figure 41 and 42) with comfortable sitting, are good spaces for brainstorming or meeting with prospective candidates (Papandrea, 2019).



Figure 41: Informal Conference Room at Visconde de Pirajá 495 in Rio de Janeiro (URL10).

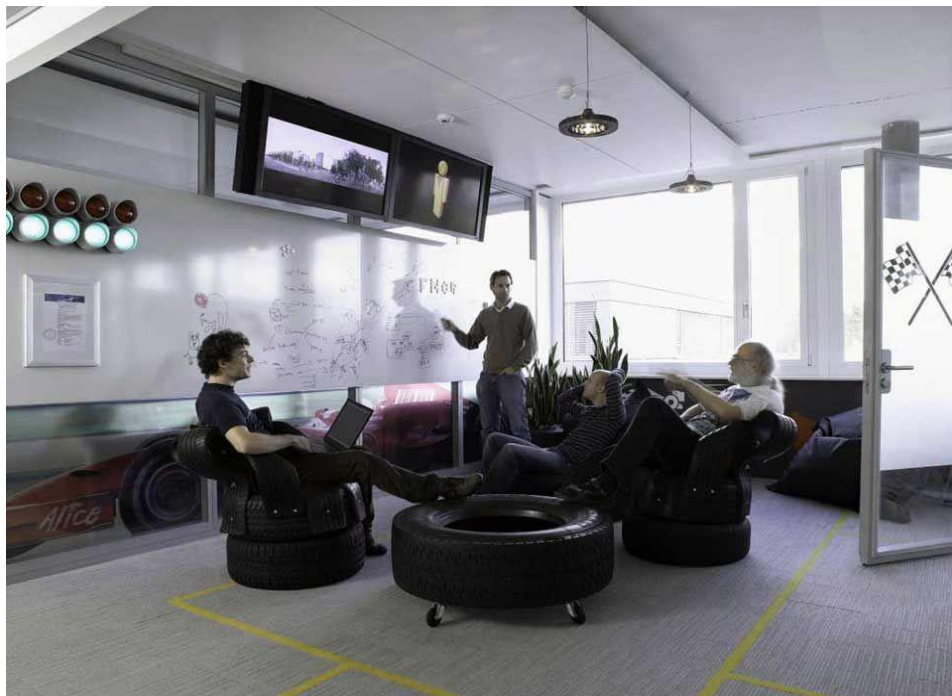


Figure 42: Informal Meeting Room at Google Office (URL16).

Sometimes employees need to recharge and refresh their brains, so they need a space for nap or relaxing. According to Radcliffe, Vice President of Google's Real Estate & Workplace Services: "No workplace is complete without a nap pod" (CBS News, 2013).

Also, the spaces with comfortable seating that feel like a living room can be a good place for employees to refresh during their work, especially when they are in the midst of a challenging project.

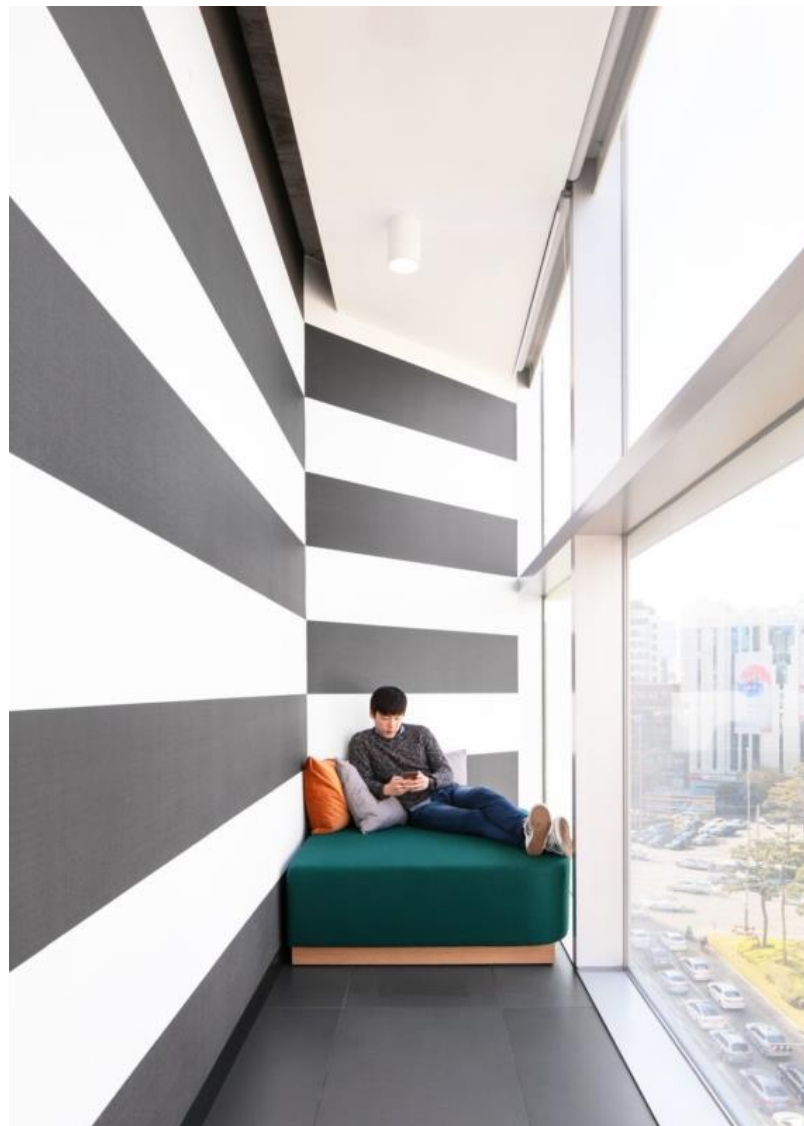


Figure 43: Relaxing Space in Busan, Korea (URL10).



Figure 44: Relaxing Place at Google Office (URL16).

Outdoor workspace with fresh air, sunlight, and greenery can also contribute to improve employees' health and wellness supporting improved morale and productivity. Additionally, both morning and evening natural lights are beneficial for employees; it can improve energy, alertness, and productivity (Papandrea, 2019).



Figure 45: Outwork Space, Facebook Office (URL15).

Despite the popularity of telework and remote work employee prefer to work in spaces which are more comfortable for them. On the other hand, because of the importance

of employee empowerment companies try to make their offices flexible with variety of spaces that employee need to keep them at office area for better result and higher efficiency. That's why flexibility is important in the new-age offices.

Movable furniture can be a good support to create flexible office spaces. Designing a work environment in which furniture can be moved easily represents the concept of flexibility. Movable furniture and modular furniture are two types of furniture that can be used in the office.

Movability is an intelligent design concept that permits furniture modification to accommodate any personal needs. Productions of moveable walls have become the best solution or choice regarding flexibility of space (Young-Ju, 2008). Figures 41 and 42 show some examples of movable furniture in the office.

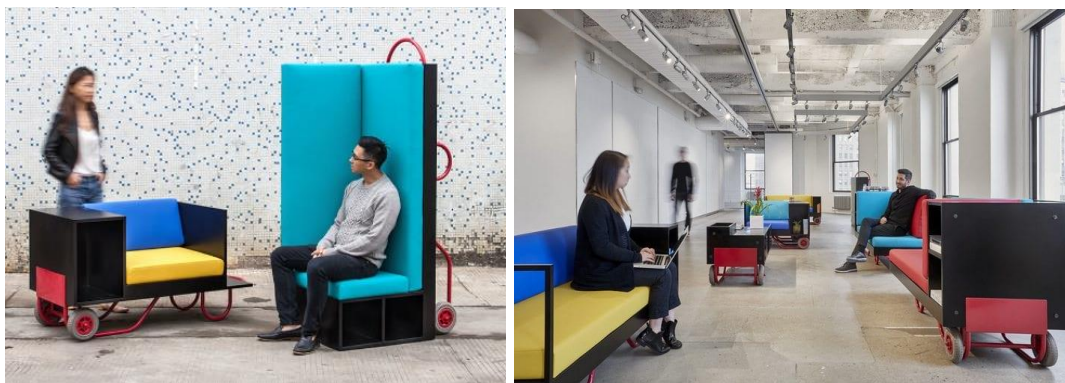


Figure 46: Movable Furniture (URL16).



Figure 47: Movable Office Furniture (URL16).

Bhatia (2005) defines modular furniture as a furniture system made up of numerous small parts or subsystems known as modules portraying specific dimensions. He mentions about characteristics of modular furniture: “Separable and Joinable Modular” furniture can easily be assembled together and simultaneously avoid damage from the joined parts.

Design flexibility: It is possible to change, reduce, and extend the furniture’s shape whenever it is required aforementioned factors provide easier and more flexible design (Bhatia, 2005).



Figure 48: Modular Office Furniture (URL18).

Flexible space and furniture are used in the new age offices for creating more useful office spaces. By flexible furniture possibility of changing space is increased, for example, at Google companies, there is a space which is called “Garage” and it is one of the most flexible spaces. Because all furniture at the garage are movable or they can be transformed (Direkova, 2013). So, flexibility and mobility can be named as important factors in the design of new offices.

3.3.2 Types of Collaboration

Most collaboration in office historically took place through formal, scheduled meetings comprising of many participants. Consequentially organizations acquired years of experience building conference rooms and other meeting spaces that are

formal. The main purpose of these spaces was to enable large group work processes, effectual exchanges of information, and decision making. According to research that O'Neil did in 2010 for Knoll Workplace, from the perspective of employees as well as their organizations, two elements of collaboration changed fundamentally. Firstly, as part of their collaborative experience, employees increasingly desire social connection and engagement (O'Neill M. , 2010). Secondly, both operational excellence and innovation are required by organizations to succeed. Process efficiencies, such as the speed of group decision making, are related to operational excellence. Through informal, social, creative interactions innovation is nurtured. The charge towards a greater variety of collaborative workspaces is driven by a combination of shifting employee expectations of group work experience and emerging enterprise needs. There's a shift within the workplace, from a "me" to a "we" work environment from which an assortment of technology-rich group spaces is obtainable (O'Neill M. , 2013).

In order to support collaboration, organizations provide a substantial breadth of open and enclosed space types. Other spaces are offered in line with traditional large, medium, and small meeting areas that remain the most widespread collaborative spaces. Amongst these spaces exist relatively newer concepts such as huddle rooms, videoconference and café spaces, "brainstorming" space and game rooms. More than half of all respondents claim brainstorming is the most important collaborative behavior for business success, followed by informal interactions (O'Neill M. , 2013).



Figure 49: Brainstorming Space with Whiteboard Wall for Analyzing at an Office in USA (URL19).

According to O’Neil (2013), in order to spark creative thinking, these spaces are usually furnished with display technology, whiteboards, chalkboards, writeable or “tackable” walls, lounge furnishings, specialized lighting and other elements which are casual. Certain industries such as high tech companies frequently use game rooms (O’Neill M. , 2013).



Figure 50: Huddle Room at the LinkedIn Office (URL20).

Impromptu interactions that occur when people run into one another or briefly review an idea chiefly result in collaboration (Heerwagen, Kampschroer, Powell, & Loftness, 2004). This brief collaboration can also be referred to as “casual interactions”. Casual

break out spaces such as café areas or lounges support these interactions (Hua, Loftness, Kraut, & Powell, 2010).

In Herman Miller's company website written by Koschmam (2009) they analyzed how people collaborate and how their interactions vary over a day and throughout the life of a project. By differentiating why, where, when and how people connect independent of content or industry, the team was able to articulate a global “anatomy of collaboration.”. She said, “outlining these collaborative work behaviors will empower designers and decision-makers with a greater understanding of how people work and will enable more informed choices in regards to office spaces” (Koschmann, 2009). According to her, there are 10 ways of collaboration or mods of work which include “Chat, Converse, Co-Create, Divide & Conquer, Huddle, Warm Up, Cool Down, Show & Tell, Process & Respond, Create and Contemplate”.

New offices by providing a variety of spaces can support the different types of collaboration which was mentioned above. Most of the time a group of knowledge workers needs to talk and share their idea and they need a small space like Huddle room with collaboration technology such as mini-video walls, smartboards, or even video cameras to capture brainstorming process (Electronic Company, 2019).

According to Wagner and Watch (2017), well-designed kitchens or cafes at new offices are good places for social interaction and asking a question or seek out an opinion which supports the chat mode that was mentioned before (Wagner & Watch, 2017).



Figure 51: Google Office Café and lounges (URL16).

Providing small semi-private spaces at new offices which are good for one or two people for more focusing on their work can supports the Converse and Co-create modes of collaboration (Figure 52).



Figure 52: Royal London Office (URL21).

According to a study on Relationship Between Workplace Spatial Setting and Occupant-Perceived Support for Collaboration by Hua Ying and et al. (2011), the most

important factors which enable or hinder collaboration were “the distance from the workstation to meeting space, the distance from workstation to shared service area, the distance from workstation to kitchen/coffee area, and the percentage of floor space that was dedicated to shared services and amenities” (Hua, Loftness, Heerwagen, & Powell, 2011, p. 808). This proves that the proximity of space that encourages casual encounters between employees is in full support of collaboration.

A fun open-plan office can be a good example of a collaboration office. They are directly connected to the 1950s landscape offices. Large technology companies in Silicon Valley occupy the archetype of contemporary, fun open-plan offices (Thanem & Värlander, 2014). In order to generate creativity and promote innovation, companies in Silicon Valley provide their employees with varied spaces such as game areas, cafes, and yoga rooms (McCoy & Evans, 2002). CEO Mark Zuckerberg stated that the largest open-plan office space Facebook relocated into was designed in order to enhance communication and interaction, which he asserted are imperative for effective collaboration (Frankel, 2015).

Transparency

Transparency is another issue that many designers of in new offices pay attention to. According to Piotrowski and Rogers (2010), transparency (Figure 53) within the workplace is promoted by the use of glass walls and doors. Better teamwork flourishes when everyone sees what everyone is doing. The feeling of being isolated from the rest of the team is hindered through the use of glass walls and doors. Since glass walls and doors are sound-proof, people can easily concentrate and focus on their work. Since people know that through the transparency of glass walls and doors, they can be observed, they become well behaved. This directly encourages integrity and honesty

within the work environment. There's extensive use of glass in today's most creative office designs (Piotrowski & Rogers, 2010).



Figure 53: Transparency in the Office Area (URL18).

3.3.3 Employee Health

According to occupational health and safety research (systematic research to attain new information about job-related safety and health), throughout the last 20 years, health promotion in the workplace has developed into an autonomous discipline. The approach is related to health and health promotion awareness as it is described in the Ottawa Charter (1986) by the World Health Organization (WHO) (Ottawa Charter, 1986). Health was no more considered as a negative sense of the absence of illness, but as a positive collaboration between physical, psychological and social well-being. Therefore, it is of critical importance to consider that the workplace is an essential location to promote the employees' health. This leads to an expansive concept of workplace health promotion. Workplace health promotion comprised of multipurpose activities for healthy lifestyle promotion. It could also comprise providing sports facilities or courses to support physical activity, motivating employees to exercise, supplying healthy diet information and encouraging employees to eat lunch within work premises (Workplace health promotion, 2012). So, new age offices such as Google and Facebook add some facilities like gym, yoga and Pilates classes,

swimming pool and lots of other activity spaces in their office for employee to avoid sicknesses that appear because of prolonged sitting. And also, they have different types of café and kitchens that serve free and healthy food to the employees. In Google offices, there is a special kitchen called “micro kitchen”. Employees can make their own food and drinks with free provided materials.

In the process of creating a good workplace, especially with the focus on happier and healthy places, the fact of poor lighting often ignored. But bad lighting can directly affect health conditions in both physical and mental terms. Eye strain, headaches, exhaustion, stress, and anxiety are some results of bad lighting in the high-pressured work environments (Agarwal, 2018). On the other hand, daylight is a crucial part of human health due to its positive effects on emotional and mental wellbeing. In terms of human visual comfort, daylight is known as the best light without creating any environmental burden. Therefore, the occupants’ physical and psychological needs are being affected by windows and daylight in working places (Kang, Ouab, & MingMak, 2017). According to the World Green Building Council, employees are more engaged and focused on their tasks when they work in natural light. This also increases their collaboration with other team members. The result of this kind of engagement and collaboration is more productivity and success (Green building council, 2016). Therefore, huge companies such as Google, Facebook, and Apple use glass walls and huge windows to increase natural light at the office spaces.

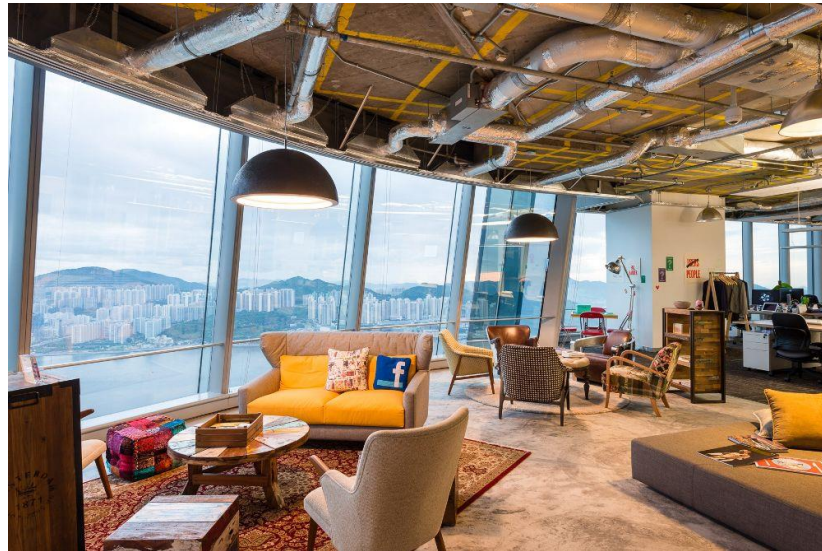


Figure 54: Natural Light at the Facebook Office (URL15).

3.3.4 Creating Fun and Friendship Culture

According to a traditional perspective of management philosophy, work means work and fun get in the way. But nowadays, a lot of companies try to change this perspective by adding the culture of having fun in the workplace in order to gain a more sustainable success for the organization (Bilginoğlu & Yozgat , 2018). Picture 55, 56 shows fun office in Madrid design by Izaskun Chinchilla Architects.



Figure 55: Ikea Office Interior Space in Madrid (URL 23).

Happiness in a professional working environment is a positive mindset that helps people to have their best performance and use their full potential. In order to gain happiness at work, people must be careful about their general performance increases and decreases, either if they are working alone or with others (Pryce-Jones, 2011).

The notion of “workplace happiness” is also known as work-happiness or happiness at work. According to Fisher (2010), workplace happiness can be defined as a construct that represents pleasant judgments, pleasant experiences, or positive affective workplace experiences (Fisher, 2010). Pryce Jones in her book, “Happiness at work: Maximizing your psychological capital for success”, defines workplace happiness as a frame of mind that helps people to maximize their performance and attain their potential. And it happens by being aware of the highs and lows when working with other people or alone (Pryce-Jones, 2011).

According to Kahle (2015), making a workplace more fun is the business leaders’ responsibility, while Gostick and Christopher (2008) believe that it is not necessarily the managers’ job to initiate fun, but they undoubtedly let fun to happen and encourage it. Furthermore, they also mention that the managers should know the fact that the fun must begin on the employee’s first day in order to lighten the stress and tension of joining to a new team and make the environment more enjoyable (Kahle, 2015; Gostick & Christopher, 2010).



Figure 56: Ikea Office Interior Space in Madrid (URL 23).

There is an increase in the number of companies that fun is the permanent part of their mission and value statements. As a result, there are organizations where employees wake up after a weekend and are happy of starting a new working week since they are eager to get back to work (Emmerich, 2009).

According to Bilginoglu and Yozgat (2018), increasing the motivation of people to work harder, faster and smarter has three techniques: threatening them, paying them more money, and making their workplace enjoyable. They also state that in the modern workplace, it is not much effective to threaten people, and it has only short-term success when employees are paid lots of money, but having an enjoyable workplace

makes a real positive change. Therefore, it is very important for leadership experts and managers to learn about producing an interesting atmosphere that gives inspiration for creativity. This kind of workplace will be fun and enjoyable not only for employees but also for managers (Bilginoğlu & Yozgat, 2018).



Figure 57: The Slide at Google Zurich Office instead of Stair Case to Make Fun (URL16).

The definition of friendship is a close relationship among friends. The way of expressing friendship is emotions and behaviors (Huang, 2008). Workplace friendship is the individuals' friendship with their peers, subordinates, and superiors. It is known that workplace friendship has a positive effect on a company's productivity and improves the workers' attitudes towards their jobs. In other words, a positive friendship between workers, not only affects their happiness but also boost productivity. Friendship groups are more involved in their tasks which leads to increased efficiency. Workers with a meaningful friendship are happier in comparison to the workers who are alone (Wesarat, Yazam Sharif, & Abdul Majid, 2015). Wright (2005), also believes that people who are lonely are less happy. Since good friends are tending to behave nicely to each other, employees with significant friendships may be

happier in the working environment. Consequently, it has to be highlighted that happy employees are generally sociable individuals who have more friends (Simmons, 2014; Wesarat, Yazam Sharif, & Abdul Majid, 2015).

Color at Workplace

Color is another factor which makes the office space friendly. Moods, emotions, and feelings of people can change according to the colors and shades of the environment. So, it is obvious that color has a major effect on the human perspective. In this manner, using the right color palette in a workplace can significantly change the workforce. A work environment with a mix of agile and flexible spaces that used a range of colors is a strong communication tool in order to signify various actions in the workspace (Roper, 2017).

As an instance, using a splash of a bright hue on the wall, floor, or desk could have potential outcomes like discriminating a successful brainstorming session from an unsuccessful one, as well as improving the employee's confidence and make workers more detail-oriented. Yet, every color brings a different psychological response along, and it is very important to learn about the shades of the colors. For example according to a Forbes interview with environmental psychologist and 'Design with Science' Founder Sally Augustin: Green is referred to as an extensive and creative thought, and there is a positive connection between nature and regrowth. Therefore, painting a work area in green will make more productive employees. Figure 58 shows MVRDV house, Netherlands colored by green.



Figure 58: MVRDV house, Netherlands (URL22).

Blue, on the other hand, supports employees' creativity and encourages them to think outside the box. Zhu, noted that blue would increase their actions on all cognitive tasks. In other words, blue is suited especially to creative tasks as brainstorming (UBC Study, 2009). There are also the colors of white, cream, soft greys, and brown that are being used in order to complement other colors within the workplace. These kinds of colors create a sense of comfort for the work area but are not particularly stimulating on their own. Browns are also used to make remarkable depth. It is also important for designers to know that using too many dark colors will provoke sad and depressing feelings of employees (UBC Study, 2009) .



Figure 59: MVRDV House, Netherlands (URL22).

Today's offices try to create happiness and friendship between employees to increase teamwork. Happiness and friendship are two factors which support collaboration, employee empowerment, health, fit to the environment and make workplace homogenized. Many huge companies such as Google, Facebook, or LinkedIn use the fun culture at the offices to increase efficiency.

In summary, the new technologies have fundamentally changed the office work as well as the definition of “office worker”. The traditional approaches to office design can no more fulfil the requirements of these new workspaces and the new generation of knowledge workers. The definition of office and its function has changed tremendously today. New concepts and strategies have emerged to cope with this situation which were discussed in this chapter in detail. A summary of these new concepts and the related design strategies used in today’s office interiors are presented in table3 below.

Table 2: New Concepts and Design Strategies Used in New-age Offices

Concept	Work Strategy	Reflection in design
Employee empowerment	<p>Keeping employees at the workplace for more product and efficiency.</p> <p>Give authority to an employee Employer is decision-maker where and how to work.</p> <p>Cares about the employee</p>	<p>Creating flexible space for day and night</p> <p>Providing all the facilities at the workplace to make employees satisfied.</p> <p>Using universal design, for example, ramp or elevator at interior space cause everyone such as disables people, middle-aged people or people who disable temporarily such as pregnant woman can be commuting at office easily.</p>
Office organization	<p>There is no difference level between employee and manager</p>	<p>There is no separate room for a manager or high-level staff, and all employee works together in common space</p>
Fit between person and environment	<p>Design different space for different personality</p>	<p>For example, some people need more concentration and they can't work in a noisy space so in today's offices there is a private space for workers.</p>
Flexibility and mobility at the office	<p>Flexible scheduling (There is no official time)</p> <p>Employee is free to choose the place to work</p>	<p>Various kinds of working spaces such as Space for individual work, Space for small group work or Space for an informal meeting and etc.....</p> <p>Providing technology such as a video conference room or huddle room with collaboration technology for long-distance work.</p>
Encouraging collaboration	<p>Tries to make a face to face interaction more</p> <p>Make more possibility for informal interaction</p>	<p>Creation of informal space for increasing informal collaboration such as:</p> <ul style="list-style-type: none"> • Café; • Restaurant; • Game Room; • Lounges; • Informal Meeting Room. <p>Using a glass wall to make the space transparent to increase collaboration and face to face interaction.</p>
Caring employee health	<p>Provide health facilities for employee.</p> <p>Supplying healthy diet information</p> <p>Providing health spaces</p>	<p>Sport facilities such as gym, swimming pool or other activities.</p> <p>Relaxing or nap space for the employee to recharge their body and brain.</p> <p>Serve healthy food and drinks to employee</p> <p>Thinking about employee health in the design of workplace such as using natural light</p>
Creating fun and friendship culture	<p>Make employee more engaged at work</p> <p>Make a happy workplace for employee</p> <p>More attractive workspace</p>	<p>Adding fun places or programs at the workplace such as game room, karaoke, bar.</p> <p>Adding a variety of color, materials and etc. make the workplace more friendly</p> <p>Adding a variety of furniture to make fun and comfort.</p>

Chapter 4

EXPLORATORY EVALUATION OF CHOSEN CASES

Google Company is one of the first companies which decided to organize and design its offices with this new approach. They changed the office's meaning and redefined the office concept parallel with the new opportunities and realities provided by the new technologies. The main difference in this approach is the way the management sees its employees. According to the Laszlo Bock senior vice-president of people operation at Google "the different way we should be treating people. Because what it fundamentally comes down to is if you want to get the best out of people and if you want to do the right thing, you have to start from the question of, are people good? Or are people evil? Because if you believe people are good you treat them a certain way you give them freedom. You share information, you help them make decisions about how the company goes. Because they are good people and they will do the right thing. If you don't believe they are good, you control them, you manage them super tightly you watch over them and spy on them and try to find out what is happening and you design your company with the expectation that the employees will try to cheat and steal and do bad things for their own personal enrichment. Which is what a lot of companies end up doing" (Bock, 2014). So this new thought changes the way the work is organized. This is why the Google Company's offices as examples of the new approach to office design have been chosen to be studied as the case in this research. The case study aims to search for the methods of implication of the new ideas

(concepts) about the new offices in some of the offices of Google Company and to find out the design strategies that have been used to maintain them.

4.1 Context of the Study

Google is a multinational technology company specializes in Internet-related services and products such as search engines, software, and hardware, cloud computing, online advertising technologies. Google was founded by Larry Page and Sergey Brin. The initial operation office room of the company was a garage .The company relocated its offices to Palo Alto, California in March 1999, whereby few prominent Silicon Valley technology start-ups were located. Today the company has widely expanded and has established the headquarter (HQ) offices and campuses in every continent. There are a total of 78 Google branch offices in distinct territories around the world (Google C. ; Google , 2004). According to Smithson (2018) the Google organizational culture encourages employees to think out-of-the-box to be more productive and invent new solutions to current and emerging needs in the international market (Smithson, 2018).

In this study, seven Google offices which have been designed most recently from (2005 to 2016) have been chosen. Although some of the organization plans of the offices have been reached by the authority it was not possible to find all of them due to policies of Google firm that they are not presented on the web page. Also, it was not possible to e-mail them and asked for information. The list of these offices is shown in the below table 3.

Table 3: Name of Google Offices chosen for Case Study (2005-2016)

Google Cambridge Office	Boston, Massachusetts, United States
Google Amsterdam office	Amsterdam, Netherlands
Google Dublin Campus	Dublin, Ireland
Google Madrid Office	Madrid, Spain
Google Futuristic London	Beverly Hills, California, United States
Google Zurich Offices	Zurich, Switzerland
Google Headquarter mountain view	Mountain view. California

4.2 Method of Study

This study is a qualitative research and data collection for this study has been done in two ways. First, the basic information related to the design of the chosen offices was collected from Google's website, Google designers' website and interviews with the designers on valid websites. The information about Google offices is not widespread and also there isn't enough information on Google's website. So, all data were collected from Google's photos that are published on their official website. Unfortunately it is not possible to find all Google office's plans. Plans of buildings that are officially available on Google designer's website used in the tables.

Then, more detailed information about Google Company's approach to office work and office design was collected from speeches and videos of Google designers, CEOs or ranked employees of the Company. Important speeches were directly converted to text and important keywords or concepts related to office work and design mentioned in these speeches were noted (recursive abstraction method). Table 5 demonstrates the sources and the keywords driven from these sources.

Table 4: Keywords From Interviews and Videos

Name	Occupation	Mentioned Keywords
Coen van Dijck	Designer at Ddock firm and they designed Google office in Amsterdam Source: http://www.ddock.com/	Happiness Comfort Flexibility Daylight Healthy Nutrition Fresh air
Stefan Camenzind Tanya Ruegg	Designer at Evolution Design firm and they designed Google office in Dublin http://www.evolution-design.info/ Source: https://www.designboom.com/design/camenzind-evolution-google-08-06-2015/	Open communication and collaboration Healthy food Fun at work Staff as the most valuable asset
Jump studio	Jump studio designer of Google office in Madrid Source: http://jump-studios.com/projects/googlecampus-madrid/	Flexibility Efficiency
David Radcliffe	Vice president of Google's Real Estate & Workplace Services Source: https://www.cbsnews.com/news/inside-google-workplaces-from-perks-to-nap-pods/	Casual collision Face to face communication Relaxation and nap at work
Clive Wilkinson	Designer of Google office Source: https://clivewilkinson.com/portfolio_page/googleheadquarters/	Transparent workspace Face to face communication
Nadia Direkavo	Engineer in Google Source: https://www.youtube.com/watch?v=gqG0O6debQM&t=12s	Write everywhere Table, walls Change table to any position Flexibility and movability
Mamie Rheingold	Developer program manager in Google Source: https://www.youtube.com/watch?v=gqG0O6debQM&t=12s	Flexibility and movability
Laura Rooklin	Real estate and workplace services at Google Source: https://www.youtube.com/watch?v=PA54HWLZ2e4&list=WL&index=14&t=0s	Happier employee Health Collaborate
Jessica Wisdom	People and innovation lab at Google source: https://www.youtube.com/watch?v=PA54HWLZ2e4&list=WL&index=14&t=0s	Happiness at work Health
Henry J. Lyons	Architect of Camenzin Evolution and designer of Google campus in Dublin Source: https://www.archdaily.com/452366/google-madrid-hq-jump-studios	Healthy work Balanced work Interaction and communication between employees

Table 4 shows that all the people who talked about Google have common opinions about Google offices' interior spaces. All of them mentioned common keywords such as flexibility, health, happiness, productivity, collaboration, informal interaction and the benefit of natural light and fresh air in the offices. All these keywords support the concepts which were mentioned in Table 3 in Chapter 3. In the analysis of Google offices, this table (Table 3) has been used as the base of evaluation and table 6 have been developed to be used in the analysis phase.

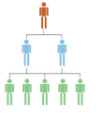

Table 5: Analysis Table

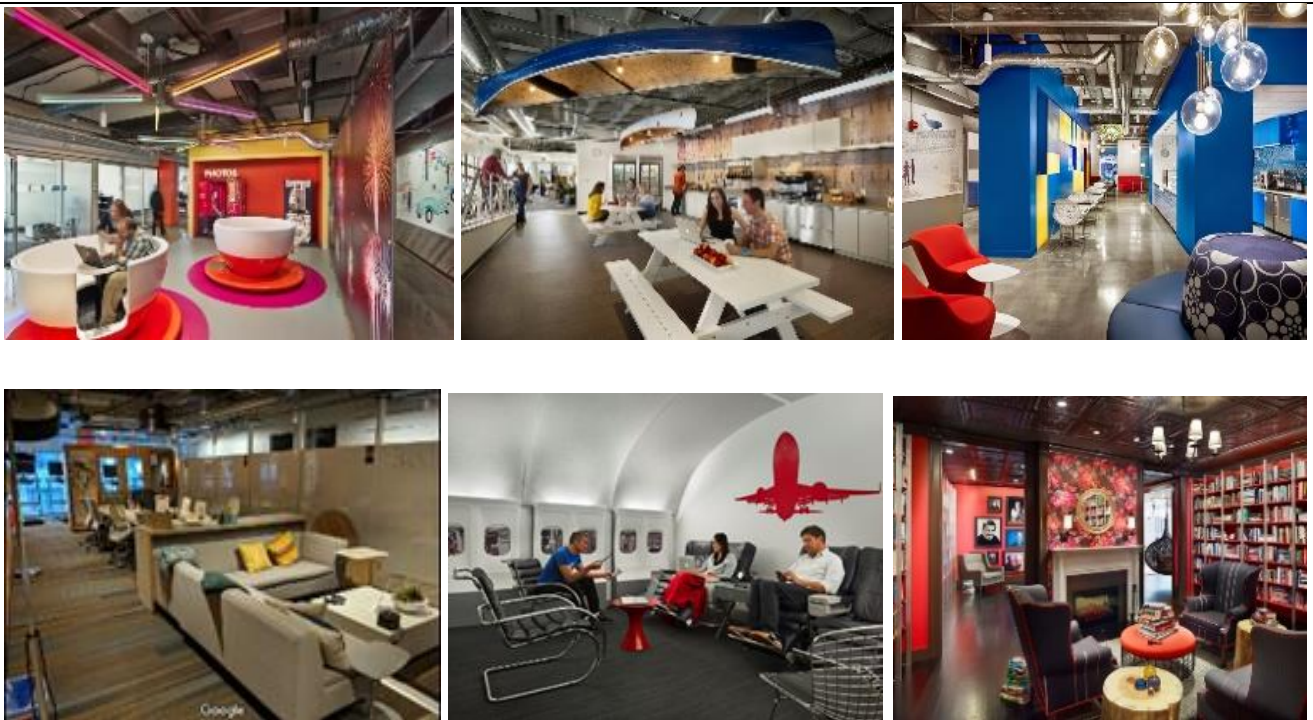
Concept	Strategy	Example
Explanation		

Each Google's office interior space is evaluated according to the mentioned concepts and it is tried to find out which strategies have been applied by the Google designers to achieve these concepts. Also a table (table 7) has been prepared for each case which provides some general information about these offices such as their designer(s), size of offices, location, etc.





Table 6: The Detail of Case Study

Office Name		Plan
Designer		
Year		
Size		


Office name	Google Cambridge Office		Types of office layout	Close plan office	Office organization	
Designer	Nelson			Open plan office		
Year	2016			Mixture of both		
Size	27870.912 m2					
Location	Boston, Massachusetts, United States					


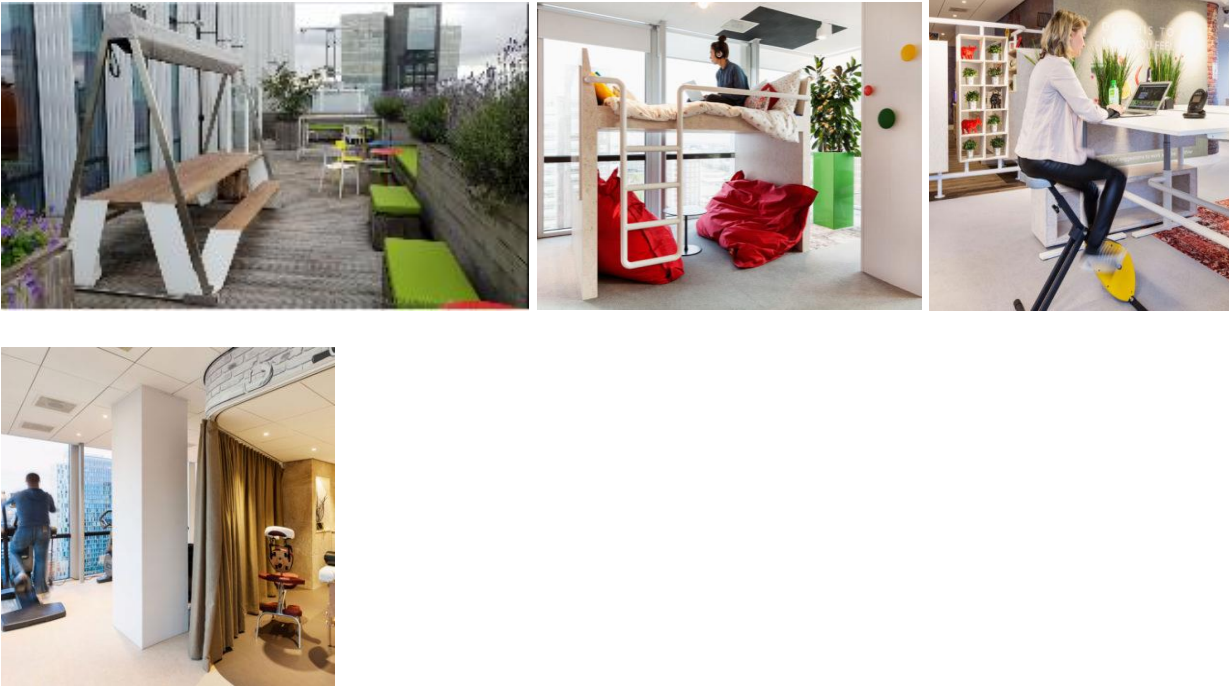
Concept	Strategy	Example
Flexibility at Google Cambridge	<p>Google Cambridge has a variety of spaces for work. Inside this space, there is a rooms with fun elements including a mini-golf area, teacup pods for small meetings or sociable interaction, bunk bed designed areas to rest in, an open kitchen/café area, lounge and seating spaces, library and open garden for employees to enjoy a break during working hours or even work outside. As well as being able to enjoy the great outdoors in this space, employees also have the opportunity to visit a large gym complete with plenty of space to take part in fitness classes and yoga sessions while at work.</p>	



Google's Cambridge office space in Boston, Massachusetts was awarded Gold in the interior design competition by the 8th Annual International Design Awards. This office is a vibrant, innovative and influential space home to quirky furniture, colorful interior design and themed rooms designed for employees to have the chance to work somewhere new every day. There are no limits for Google employees as this workspace is filled with a range of spaces that encourages collaboration in an agile environment (Nelson, 2015).

Concept	Strategy	Example
Encouraging an employee to collaborate	<p>Google Cambridge provides a variety of spaces such as café, lounge and small private space to increase face to face collaboration and informal interaction, and also they use glass walls to make the space transparent for more interaction.</p>	
Caring about employee health	<p>At Google, they provide health facilities such as gym, Yoga Pilates, and also they believe a nap at work can make their job better and more joyful so they design a space for sleeping.</p> <p>Cambridge Google, as the picture shows has bunk bed for sleeping.</p> <p>They provide healthy foods and drinks to the employee for free, and it is available during day and night at the micro kitchen, café and restaurant.</p>	
Creating fun and friendship culture	<p>This office interior with caring about Universal Design makes the office space fun as the picture shows the ramp in space is used by disabling people as well as for skateboarding.</p> <p>This Google office has different types of space for fun, such as a game room, mini-golf, etc. with colorful space furniture and materials.</p>	
Increase the fit between person and environment	<p>To increase the fit between a person and work environment at Google, they design a variety of space for different personalities.</p> <p>An employee can bring pets or other personal things that belong to them to feels home.</p>	


Office name	Google Amsterdam	
Designer	D/DOCK	
Year	2014	
Size	3000m2	
Locatio	Amsterdam, Netherlands	

Concept	Strategy	Example
<p>Flexibility at Google Amsterdam</p>	<p>Pictures show different types of space for working at Google in Amsterdam. The traditional Dutch caravan is the most wanted meeting place. This caravan repeated in other spaces with different uses for example: in other spaces, they use it as a café. There is a concentration room for employees who wants to work alone or collaborate virtually.</p> <p>Picture shows a garage room which is more flexible than other spaces. All the furniture is movable and employees can change the place of furniture easily.</p>	
<p>The concept of this office is inspired by the garage concept. The Garage was the first space that Google founder started their job in. So many elements such as graffiti walls, show the concept. Each floor is usually tied to Dutch elements - whether it's a bicycle reception desk, Delft Blue graphics in the restaurant or ceiling panels with Stroopwafel texture. This project has reached a high level of satisfaction from the employees, with its playful and surprising environment, and at the same time has completed all the standards and roles of Google workplace design, together with advanced solutions in terms of sustainability of the materials and reuse of the previous furniture</p>		

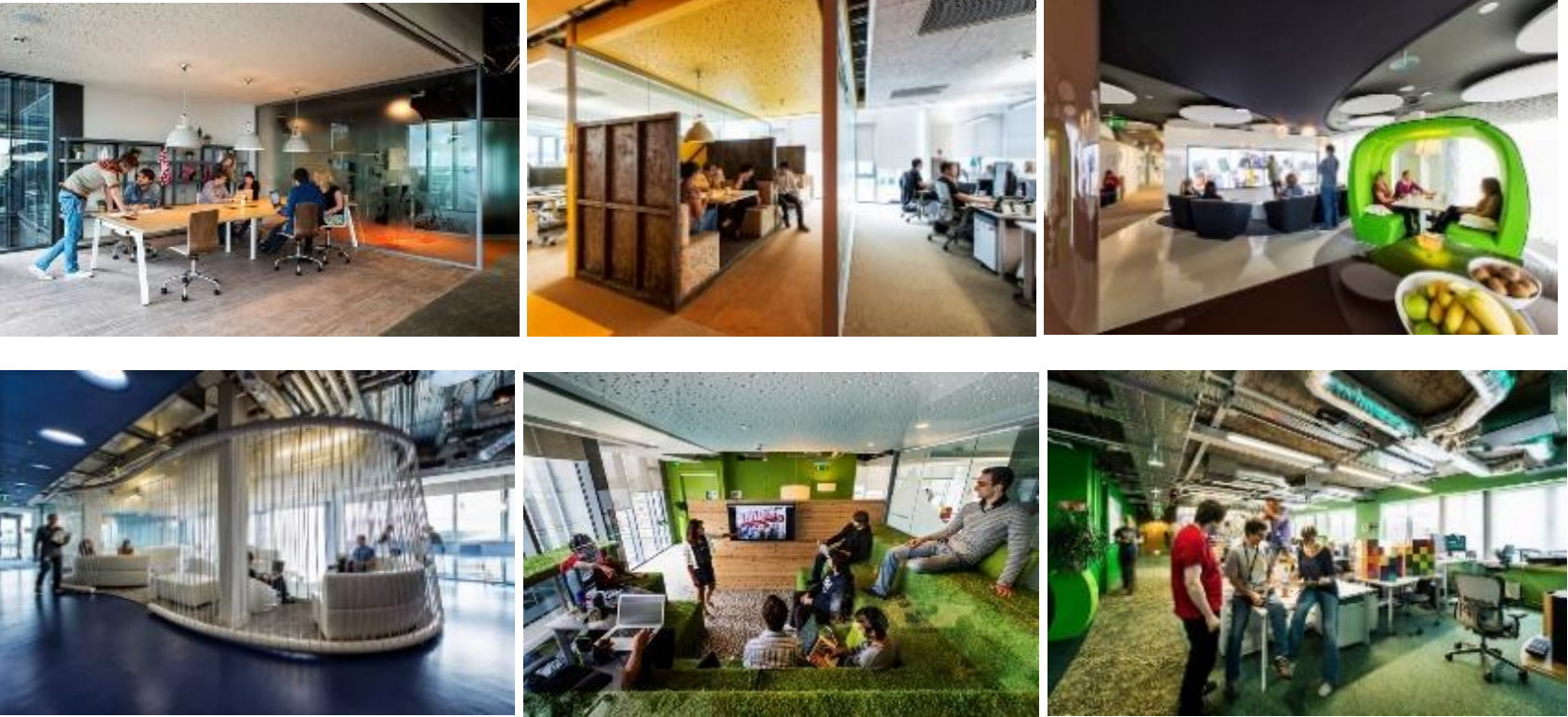

Concept	Strategy	Example
Encouraging an employee to collaborate	<p>There are lots of places for Googler to collaborate. As Figure shows, there is a booth style that is more popular for quick collaboration. Also, there is another space for collaboration with a variety of furniture and food at the workplace during the employee's work as the next figure shows.</p> <p>The restaurant is free and open 24/7, a place to meet and collaborate</p> <p>The last figures show a relaxed meeting room. It has 6 spaces for a casual meeting. As the picture shows, the design of this space is like a living room and it feels at home to people.</p>	
Caring about employee health	<p>Working in a terrace with fresh air and natural light helps employee's brain and body fresh and productive. And some attention to the wellbeing of the people: kinetic desks and a dry SPA</p>	



Concept	Strategy	Example
Creating fun and friendship culture	<p>creating a fun culture and friendship is important for Google. Playing the game during work or as figure shows employees talk and have fun during they eat and work. Or an informal meeting room with a game table that employees can play and fun while their talk.</p>	
Increase the fit between person and environment	<p>To increase the fit between a person and working environment at Google, they design a variety of space for different personalities.</p> <p>Pictures shows a space with colorful furniture and curtains for working alone.</p> <p>Another picture shows a working space interior with billiard game for employees who wants to work and also have fun during their work. And the last for small group work.</p>	

Office name	Google Dublin Campus	
Designer	Evolution Design	
Year	2013	
Size	47'000 m2	
Location	Dublin, Ireland	

Concept	Strategy	Example
Flexibility at Google Dublin Campus	The main area of each floor is the communication hub which is integrated among various functionalities depending on each floor – from open plan and flexible working spaces to micro kitchens and informal meeting rooms , alternative working zones , game areas , cafés , gym and even a 25m indoor swimming pool . As the pictures show, employees can work in any place .	

This office building comprises the campus represents an amazing workplace for Google’s ever-growing sales, marketing, finance and engineering teams, coming from more than 65 countries and speaking over 45 languages. Masterplan required the successful organization of a multitude of additional functions, such as 5 restaurants, 42 micro kitchens and communication hubs, game rooms, fitness center, pool, wellness areas, conference, learning & development center, tech stops, over 400 informal and formal meeting rooms and phone booths, etc. All these additional functions are part of the holistic work philosophy of Google encouraging a balanced, healthy work environment and enabling as much interaction and communication between the Googlers as possible (Evolution design office, 2013)

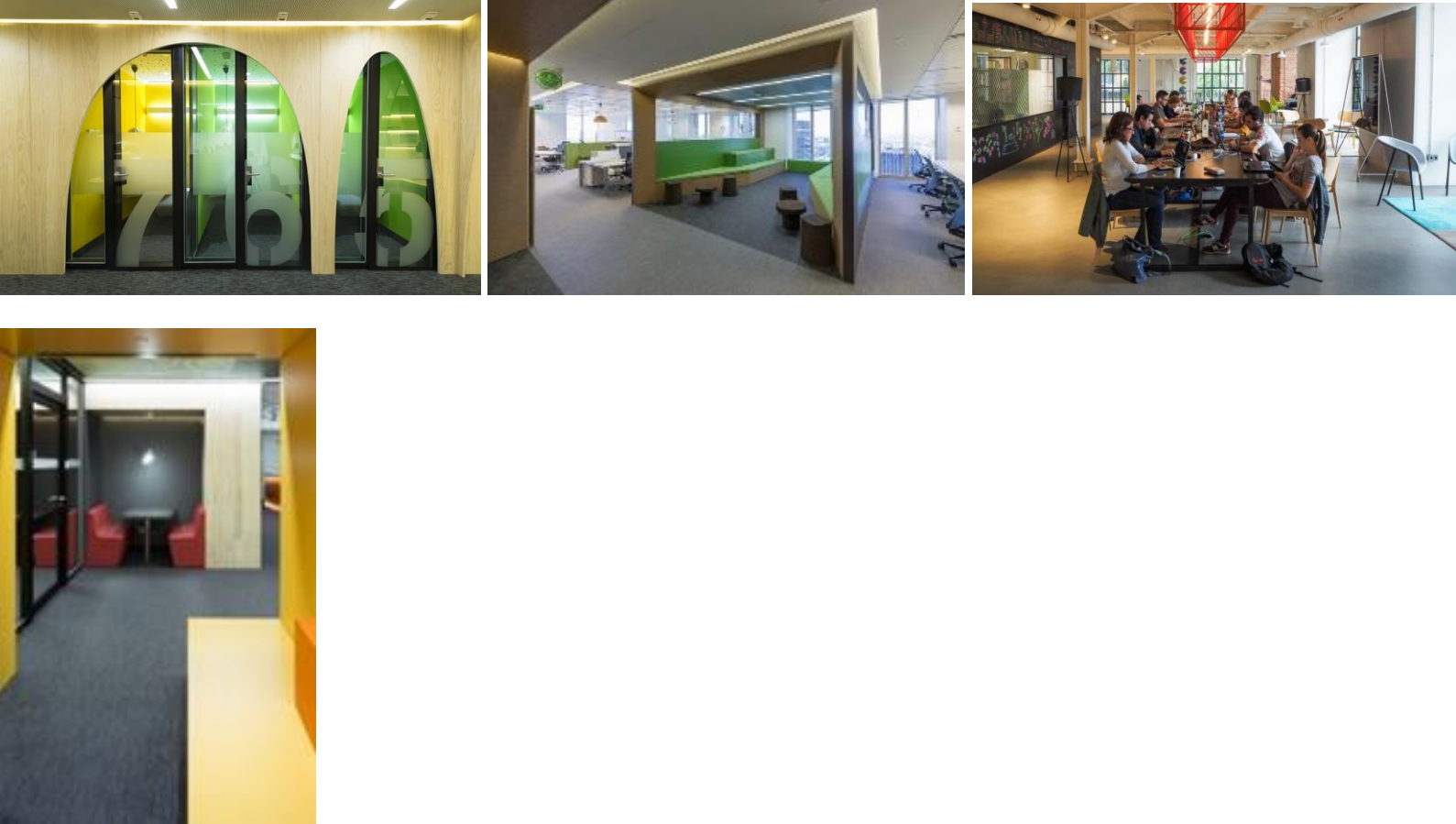

Concept	Strategy	Example
Encouraging an employee to collaborate	<p>Increasing informal collaboration and interaction is one of Google's goals.</p> <p>Figures shows a hot-desking with employee's collaboration. It also shows a semi-private space between the working area for quick collaborate. The next one shows an informal meeting space with semi-private furniture next to it. In both space, employees are talking and working.</p> <p>Figure in second rows shows the employee's collaboration in a relaxing space with huge sofas and benches.</p>	
Caring about employee health	<p>In Dublin office employees can prepare their food in micro kitchen as figures shows or they can get their free food from restaurant.</p> <p>There are many private and semi-private spaces for employees to be relax. All the space has huge windows to invite natural light to the space.</p>	

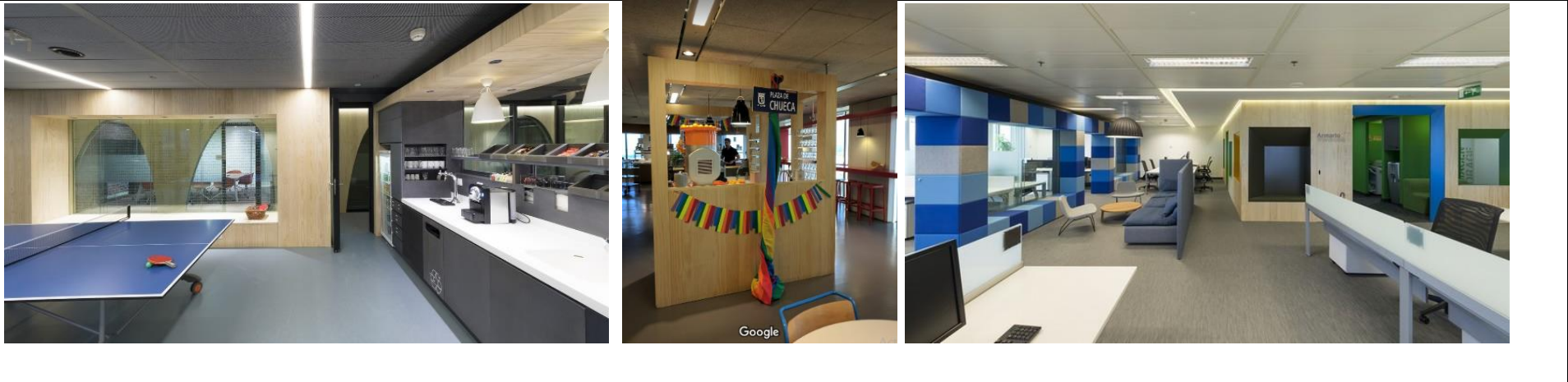
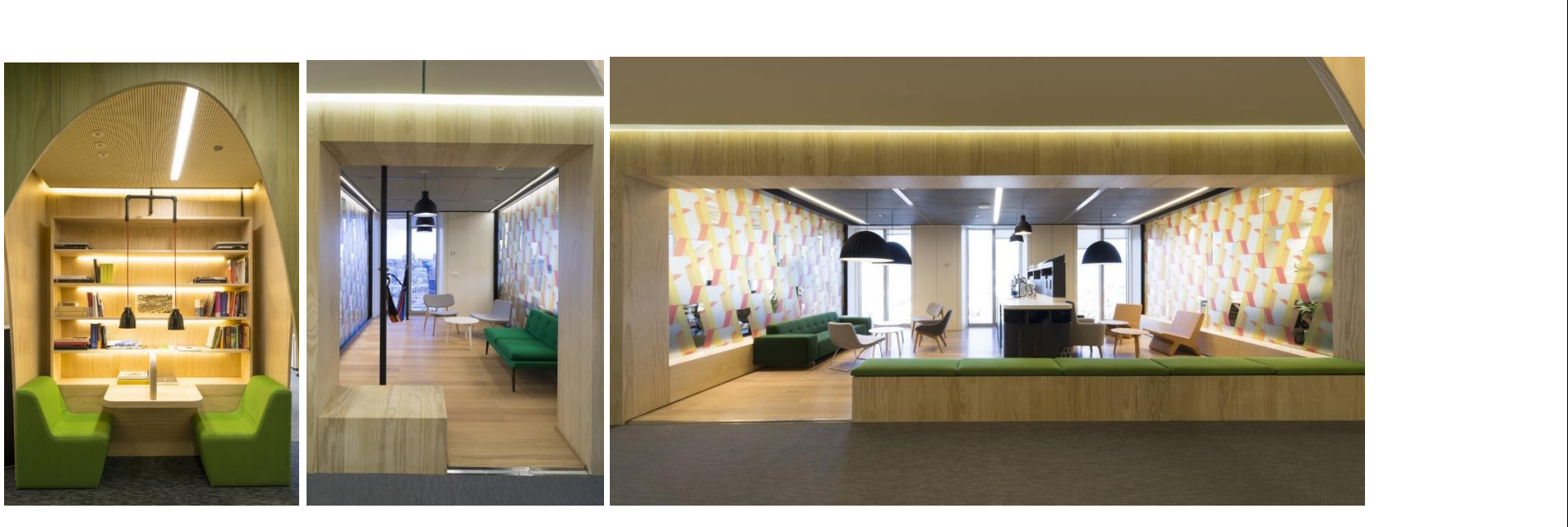
Concept	Strategy	Example
Creating fun and friendship culture	<p>Employee's in this office have fun while their work because Google believes happy employees can work better. So they created many fun spaces such as a game room, karaoke room or space for employees to play an instrument such as guitar.</p>	
Increase the fit between person and environment	<p>To increase the fit between a person and work environment at Google, they design a variety of space for different personalities.</p> <p>As picture shows each person can find a space for her/his self to do their job. For example, library for working in a silent space or as the last picture shows private space for more concentration.</p>	

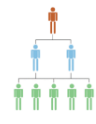

Office name	Google Madrid HQ	
Designer	Jump Studios	
Year	2013	
Size	27,000	
Locatio	Madrid, Spain	





Concept	Strategy	Example
Flexibility at Google Madrid HQ	<p>This office has two floors. The first floor is hosts the main reception, lecture theater, canteen, and a multipurpose area with a kitchen. The second floor is where the main office space is and there are several breakout spaces for games, informal presentation areas, shower facilities, a massage room and even a hammock area to add extra diversity (Jump studios, 2019).</p>	



This office space now has a higher level of flexibility and efficiency for employee and they use sustainable material inside it. Working with the concept of a timber arched core element - a reference to the spatial and material qualities of traditional Spanish architecture – the scheme has greatly improved the efficiency of the floorplate and created a highly characteristic ambiance that is relaxed and sophisticated at the same time.



Concept	Strategy	Example
Encouraging an employee to collaborate	<p>Figures show different spaces for collaboration and interaction. The first one shows the acoustic meeting rooms and the individual video conferencing cabins. The next one is the semi-private space for group work and the last one is booth style for a quick face to face interaction and collaboration.</p>	
Caring about employee health	<p>This office has vitamin bar, shower facilities, and massage room for employees. These facilities provided for employee because they care about employee's health.</p>	

Concept	Strategy	Example
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Creating fun and friendship culture</p>	<p>Employee's in this office have fun while their work because Google believes happy employees can work better. So they created many fun spaces such as the game room, for a special day, they can design their space with fun materials. Or put a comfortable sofa with a coffee table between working are can make the work area more friendly.</p>	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Increase the fit between person and environment</p>	<p>To increase the fit between a person and work environment at Google, they design a variety of space for different personalities. As pictures' shows employees can sit in a cozy corner and talk or read their book , or they can be in small private room and do their job or they can be in a bigger space with micro kitchen and prepared their own foods and do their works.</p>	

Office name	Google Engineering HQ		Types of office layout	Close plan office	Office organization	
Designer	Penson			Open plan office		
Year	2011			Mixture of both		
Size	_____					
Locatio	Londo					

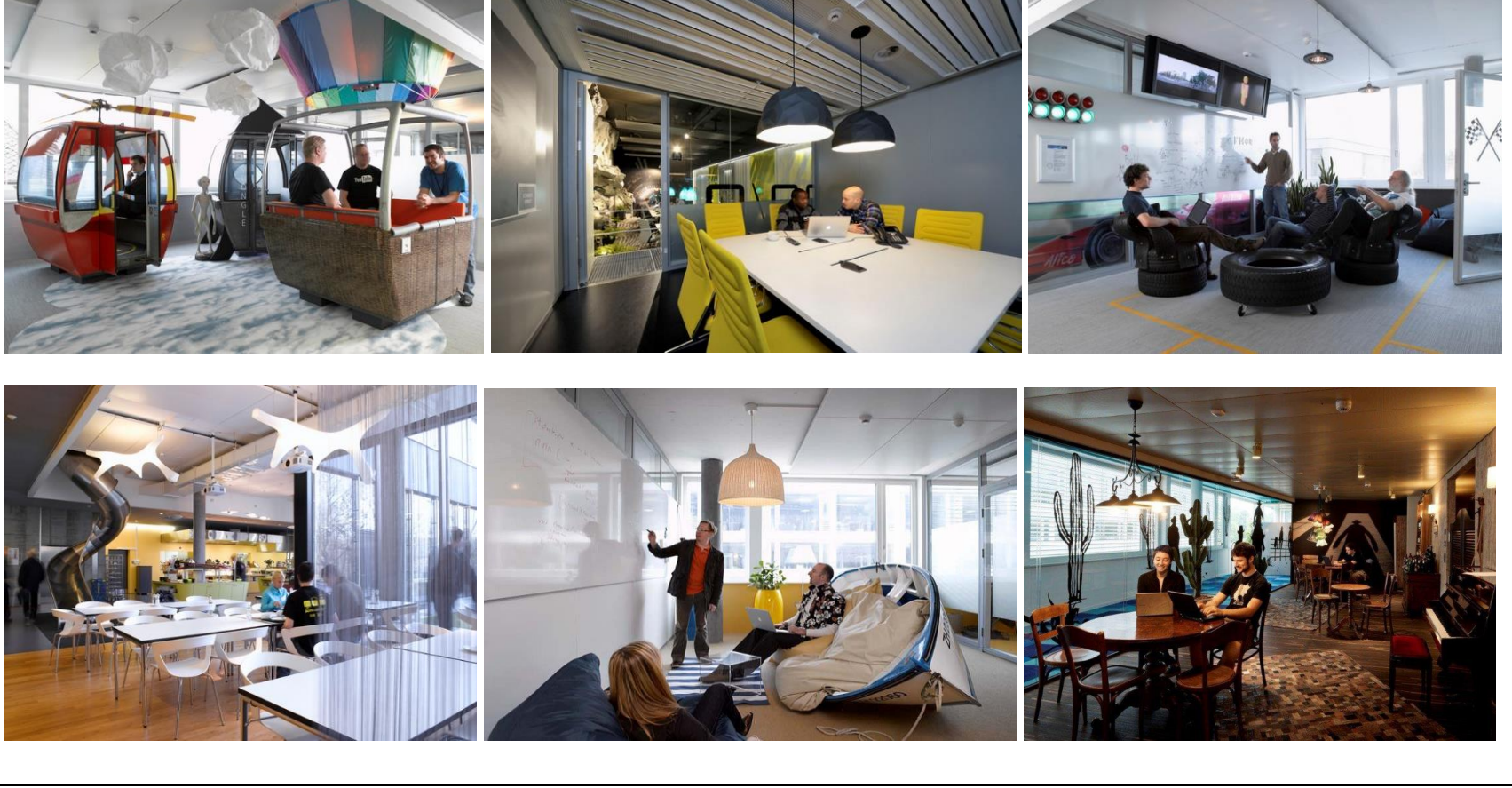
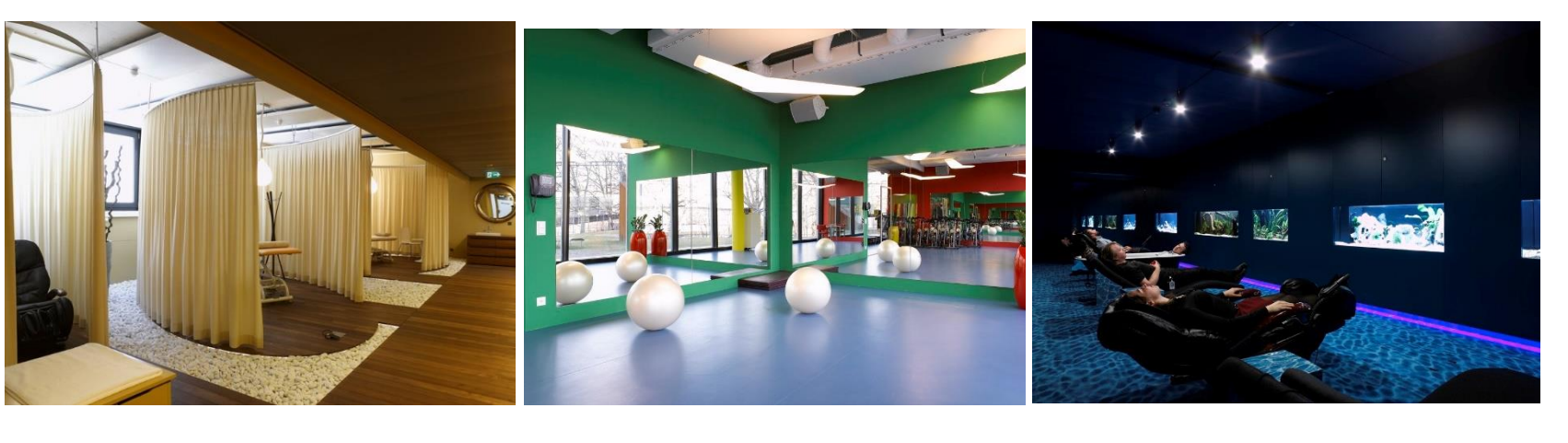
Concept	Strategy	Example
Flexibility at Google Engineering HQ	<p>This office also has different types of space such as game rooms, music studios, an auditorium, whiteboard walls, coffee room and flight pods that the Penson company invented specially for Google (Penson, 2011)</p> <p>The first picture shows the working space in a corridor with a whiteboard wall. Then there is a small video conference room and last two pictures' shows different types of working area.</p>	   
<p>Google engineering HQ interior design focused on the need to let creativity run wild. They filled the building with whiteboards, work stations and creatives- and playful-breakout areas. Privacy , daylight and acoustic separation are still at the heart of the layout and the workplace interior design (Penson, 2011).</p>		

Concept	Strategy	Example
Encouraging an employee to collaborate	<p>In this office, all the walls have a huge surface whiteboard and employees can write on it everywhere. In all spaces, they use comfortable furniture to increase informal collaboration and interaction between employees.</p>	 <p>The first image shows a room with a large whiteboard wall and a red sofa. The second image shows a room with a large whiteboard wall and a white sofa. The third image shows a room with a large whiteboard wall and a colorful striped rug.</p>
Caring about employee health	<p>As figures shows, this Google office also has fresh fruit and vitamin bar; in the private room employees can sleep on yellow steps easily and the last picture shows the message room for relaxing.</p>	 <p>The first image shows a fruit bar with people sitting at tables. The second image shows a private room with a yellow sofa and a 'SPACE INVADERS' sign. The third image shows a message room with a green table and a person standing.</p>


Concept	Strategy	Example
<p>Creating fun and friendship culture</p>	<p>Different colors and lights, different materials, pictures and objects make this office interior fun and friendly.</p>	
<p>Increase the fit between person and environment</p>	<p>To increase the fit between a person and work environment at Google, they design a variety of space for different personalities. For example, they put a headset for employees or there are lots of cozy places that employee with different personalities can do their job.</p>	


Office name	Google Zurich Offices	
Designer	Evolution Design	
Year	2008	
Size	12000 m2	
Locatio	Zurich, Switzerland	

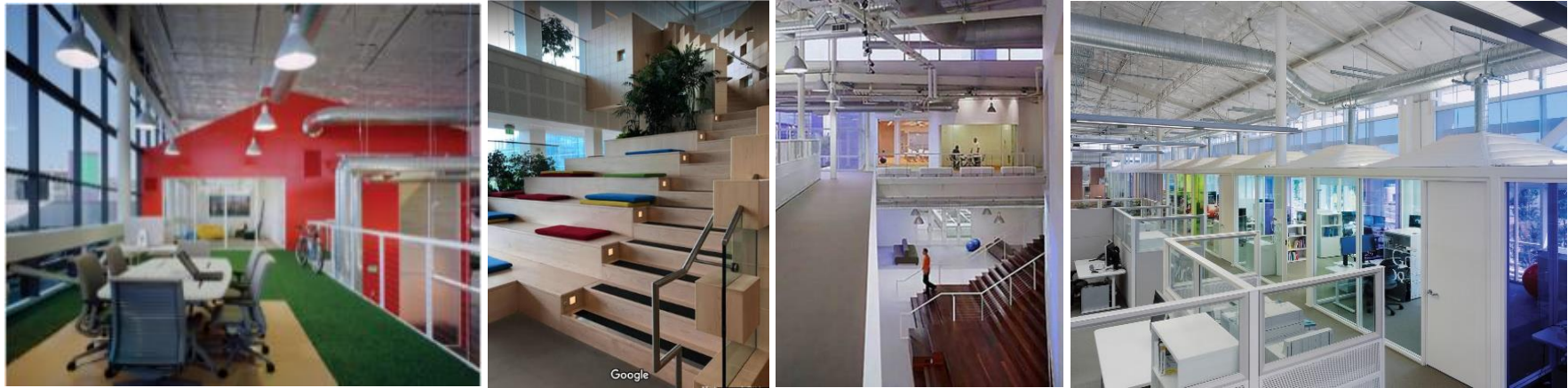

Concept	Strategy	Example
Flexibility at Google Zurich	<p>The office areas are a mixture of open-plan workspaces for 6-10 people and enclosed offices for 4-6 people. All office enclosures are constructed using a glass partition system, which maintains transparency and optimizes daylight while reducing noise and achieving the required degree of privacy for working teams (Ruegg, 2008)</p>	
<p>Google's EMEA Engineering Hub in Zurich, Switzerland, is a great example of a modern workspace design, which cultivates an energized and inspiring work environment that is relaxed but focused, and buzzing with activities. At the time of completion in 2008, this office was one of the early examples of future workplace design development. A key element in the design approach was that the Googlers in Zurich (fondly referred to as Zooglers) should participate in the design process to create their own local identity. Zoogler preferred to reduce their personal net area of workspace in order to gain more communal and meeting areas. The working areas were therefore designed with a high degree of space efficiency (Ruegg, 2008).</p>		

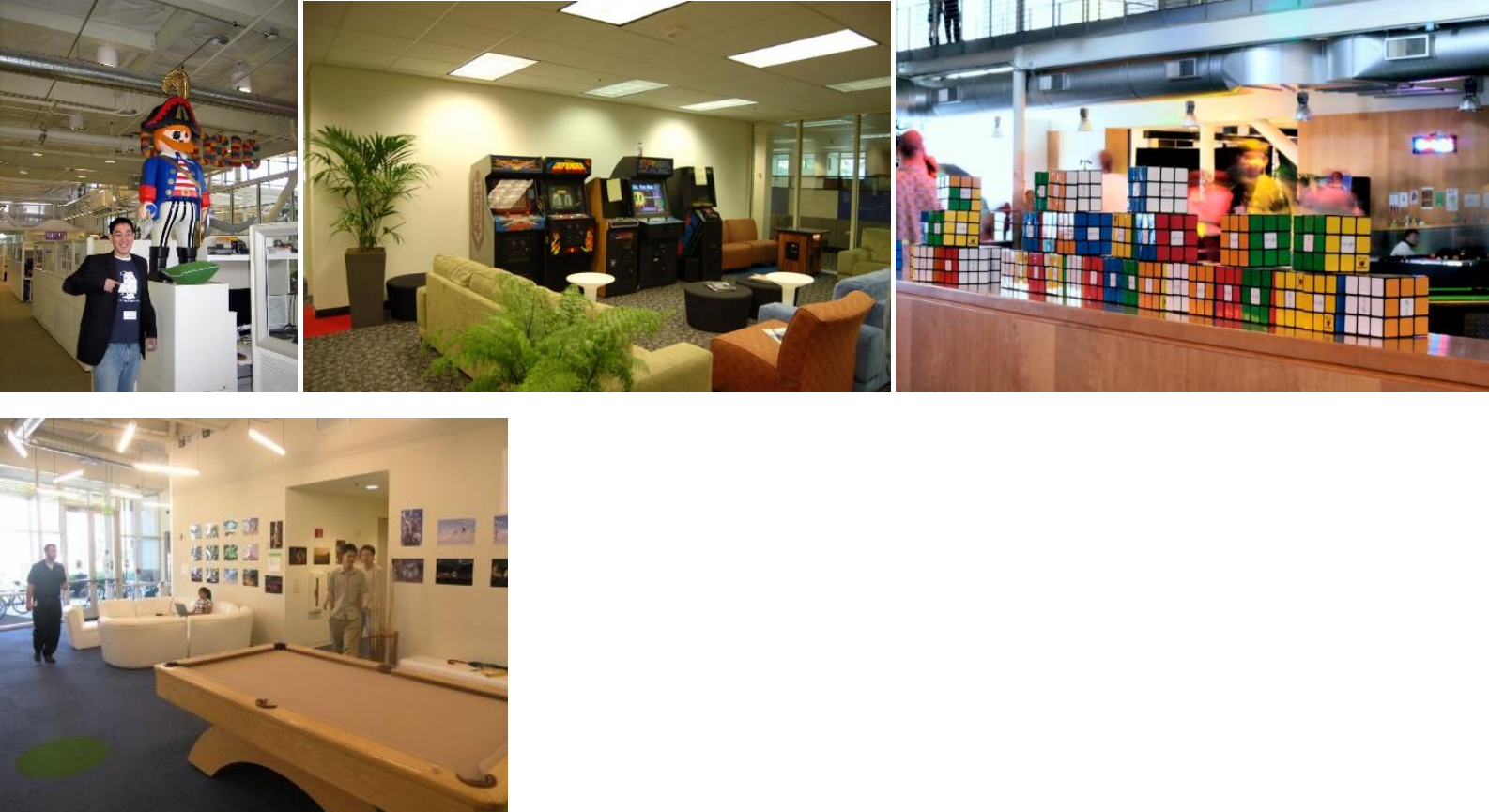
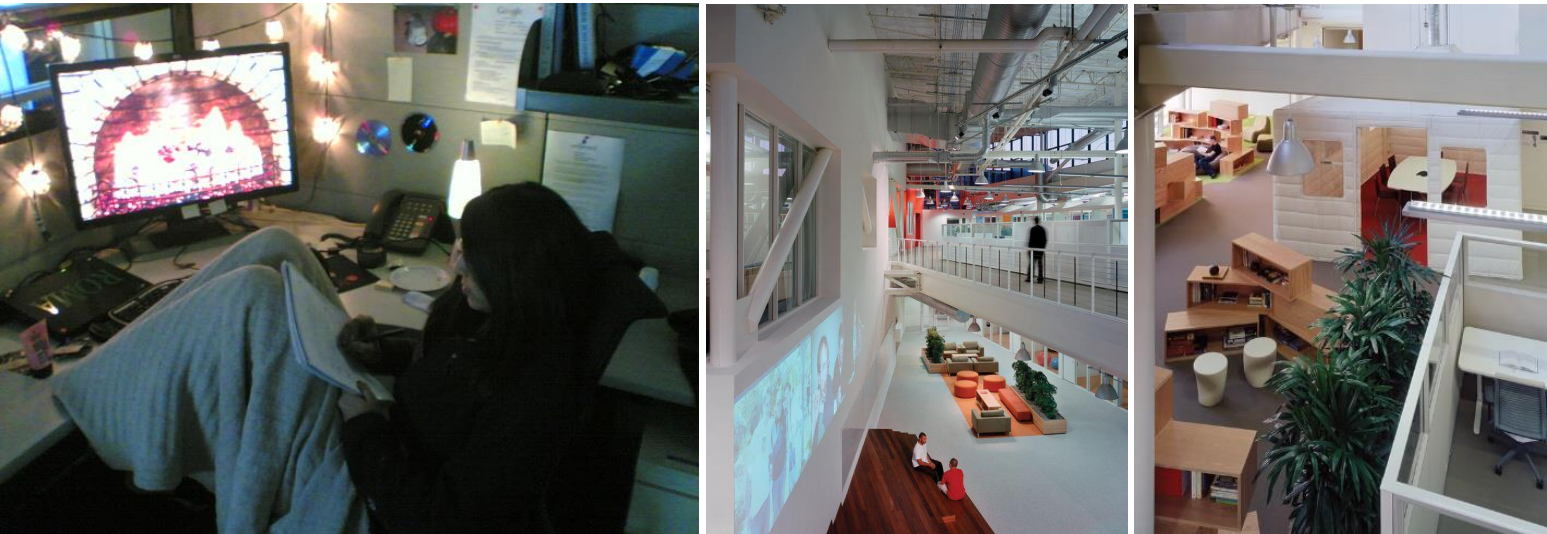
Concept	Strategy	Example
Encouraging employee to collaborate	<p>Consequently, there are a large number of small to medium-size meeting rooms situated throughout the office space. Apart from the standard meeting rooms, there are also many informal meeting areas, which have a more relaxed atmosphere for teams to have creative discussion around white-boards.</p>	
Caring about employee health	<p>Google culture believe relaxation to be crucial to innovation and stimulating original thought. So they provided many relaxation areas such as massage and an aquarium water lounge for relaxation for employee.</p> <p>To balance the good food, staffed gym offers yoga, Pilates and fitness classes and encourages the Zooglers to keep fit and healthy.</p>	

Concept	Strategy	Example
Creating fun and friendship culture	<p>Fun culture increase employee's efficiency. Google Zurich to create a fun culture and speedy movement between floors put fire pole to slide down and link some of the communal areas.</p> <p>And for the really hungry Zooglers, a steep and fast slide spirals down from the offices on the first floor directly into the center of the Milliways cafeteria on the ground floor.</p> <p>Also, there are other spaces such as karaoke or game rooms for the employee to play and have fun.</p>	
Increase the fit between person and environment	<p>As zoogler participate in the design process to create their own local there are many places for them to use it. For example, a small private room in different shapes or semi-private space for group work or a greenery space for reading a book.</p>	

Office name	Google HQ mountain view	
Designer	Clive Wilkinson	
Year	2005	
Size	180000	
Locatio	Mountain view. California	

Concept	Strategy	Example
Flexibility at Google HQ mountain view	Different size of flexible spaces as pictures' shows to respond to the staff's needs and to the variable composition of work teams.	
<p>This office interior designed based on some basic principles: flexibility to respond to the staff's needs and to the variable composition of work teams, interaction among different rooms, designed to accommodate three people and allow users to control light, sound, airflow and other environmental factors, balanced relationship between places of work and places for relaxation, plus areas for hosting seminars, conventions and training workshops. High technology, energy conservation and sustainability are the project's most important aims (Wilkinson, 2018)</p>		

Concept	Strategy	Example
Encouraging an employee to collaborate	<p>This office was a cubical land as Clive Wilkinson for increasing the collaboration, he transferred all solid walls to the glass walls. There are different types of space such as open space with hot-desking or small close space with comfortable furniture existed in this office for collaboration. even in some parts, they use staircase for working and collaborative.</p>	
Caring about employee health	<p>This office also has free foods and drinks, and they encourage an employee to keep fit by training in the gym. For sleeping, they put nap pod which is designed especially for Google.</p>	

Concept	Strategy	Example
Creating fun and friendship culture	<p>Googler can bring any personal things to the office and create their own space. Game spaces make a happy time for them, and they have different types of celebration.</p>	
Increase the fit between person and environment	<p>Space should be fit to everyone and employees with different personalities could work in the office as pictures' shows an employee hang small lights and sit in a position that she wants and do their work.</p>	

4.3 Discussion and Finding

The Google offices have changed the hierarchical organization to the flat organization, in which no specific room has been allocated for managers and all levels of employees are working at the same area even behind the same table.

Google tries to establish a new culture in the office environment. According to evolution design (designer of Google office), staffs are the most valuable assets for Google so, they try to increase employee empowerment providing different facilities and opportunities. For example, flexibility and mobility at the office, increasing informal collaboration and interaction, caring about employee health, and creating fun culture are the concepts that support the employee empowerment.

All Google offices have a combination layout in there are open and close spaces, small private spaces for more concentration and semi-close spaces for small group work.

According to the given literature review in chapter 3, flexibility and mobility at space are important features for Google offices. The variety of spaces makes it much easier for employees to collaborate, and they can work in any place as they wish. Flexibility and mobility allow the employee to change the workspace easily. For example, at Google Garage flexibility of layout is set at the highest level. According to Nadia Direkova one of the Google engineers who have expressed her ideas about Google garage: “it is like playground you can write on the tables, on the walls and then you can reconfigure the table to be in any position that you want. Everything is on wheels and allows people to be flexible and playful in a way that the typical space and the typical conference room just wouldn’t” (Direkova, 2013). Mamie Rheingold developer program manager of Google also mentions that: “Googler was always confined to

particular space in the room so we built the power and networking on a grid that drops down from the ceiling so you can go anywhere in it always in rich. So flexibility has played a key role at Google offices (Rheingold , 2016) .

Types of interaction and collaboration are also important features. Google culture tries to increase different types of it, such as formal interaction and informal interaction. Formal interaction can happen at a formal meeting room, but face to face interaction and Casual collisions can happen anytime at any place. Google's goal is to increase informal interaction more than formal. So they design informal spaces such as game rooms, café, restaurant and lounges for informal interaction because informal collaboration is the result of informal interaction. They also try to make the interior space transparent for more interaction so they remove walls or they use a glass wall instead of a solid wall.

According to Radcliffe, vice president of Google's Real Estate & Workplace Services, "Casual collisions are what we try and create in the work environment. You can't schedule innovation; you can't schedule idea generation, and so when we think our facilities around the world, we're looking for little opportunities for engineers or for creative people to come together" (CBS News, 2013).

Employees can communicate with each other throughout the variety of different virtual mechanisms however, all the facilities and innovated spaces are created for face to face interaction and collaborations. For example, sharing ideas between employees when they are sitting in a café or playing is a creative idea. A good example of this idea includes ski gondolas in the Zurich office or a pub-like meeting room in Dublin.

Even the staircase and corridors are not useless spaces at Google offices. In some offices such as the Silicon Valley staircase is a place that employees can sit on and talk to each other, and it has also a whiteboard, or in Google Engineering, all the walls are covered by writable materials and corridors with various sitting are the best place for meeting.

Wellbeing of employees is also an important issue that must be taken into consideration because healthy workers are more productive, and activity makes the human brain think better. Google culture believes that employees should be active, and they shouldn't just sit behind the table and work. So, by providing health facilities such as gym, sports facilities like a swimming pool or golf in addition to free various foods and drinks, they support their employee`s health. It should be mentioned that free foods and drinks for employees would psychologically help their minds to concentrate more since they should not be worried about foods.

Based on Google culture, employees need to recharge their brains and body by relaxing or sleeping at work. Radcliffe (vice president of Google's Real Estate & Workplace Services) in an interview to CBS News says "No workplace is complete without a nap pod. We found that the five-minute to 15-minute power nap, works on Sunday before you watch the football game, why not here at work?" (CBS News, 2013).

All offices have napping area; some of them like Silicon Valley have nap pods, others like Cambridge and Amsterdam have beds. These differences are depended on the type of the employee`s job in the offices. For example, some engineers come to Google's office from other cities, and they work there for four days a week. In this case, they stay at the office all the time and in these branches, Google provides the sleeping area

with beds, bathrooms, and even laundry room for them. There are different ways used for relaxing such as spa and massage, different types of classes like Yoga and Pilates classes.

Google also believes that having fun at work, and friendship between employees would make them more productive and engaged in the workplace. Therefore, they try to make their workspace attractive by various colors and materials. They provide a lot of furniture in different shapes according to the interior design concept. For example, simple furniture can be replaced by a huge swing or sitting on a balloon shape sit would be used to raise the level of interest, happiness and joy of employees.

For more fun, Google has different types of game rooms like PlayStation, Football space, and ping pong table. In each office there are some spaces such as a karaoke room so employees can sing together, a room with a guitar or piano that they can play them, etc. Sometimes for special events at Google offices, there are concerts or shows which employee can drink in a bar and enjoy the shows.

All these analyses about the new-age office have shown that as developments in information technology has brought the opportunity of working anywhere, and at any time and the need for physical presence at work has been disappeared, the traditional function of office and workspace has been questioned and then redefined. It is now believed tha main function of office is to provide a place of communication, interaction and collaboration. Employers and companies are now trying to keep employees at offices or workplaces by making them feel at home. So, they try to empower employees and to design the interior spaces of the offices in a way that creates a lot of opportunities for all kinds of formal and informal interactions. The employees not

only have freedom in choosing their place and style of work, but also feel that the company cares about their health, welfare and happiness. This in return creates a strong culture of loyalty and a sense of belonging.

Chapter 5

CONCLUSION

Office design has a vast history, which has been briefly explained in the research by considering their changes through time with respect to the developments in the office technology and consequently the office work. This research has investigated the reason behind the design of new-age offices and explained their characteristics in detail. It was intended to help the designers to increase their knowledge about the new approaches in office design and the design strategies used in interior spaces.

In the context of the study, the history of offices and different layout of offices, their advantages and disadvantages and how they evolved in time were discussed. As well, how technologies such as a typewriter, printer, computers, internet and portable devices effected and changed employees' work were explained.

Close plan offices are good at privacy because each employee has a private office, but the interaction and collaboration between them are weak. In contrast, open-plan offices are strong at interaction and collaboration, but lack of privacy and noise hinder employees concentrate on their work. After emergence of different types of open plan layout such as office landscape, bullpen, and cubicle, other types of office, which are called mix office layout, have emerged. This office layout has a mixed layout of close and open plan offices to solve the problem of privacy and noise.

On the other hand, advanced technologies such as wireless laptops and the internet causes employees to prefer working in different places, and they may spend less time in the office. So, office spaces are losing their traditional function as less face to face interaction and communication is necessary at work and employees can communicate with each other by virtual communication and collaborate to do their job faster and easier.

Therefore, during this time, the meaning and the concept of office has changed, while some companies believe they don't need an office anymore because the nature of work and employee have changed, some others have started to think about the office's meaning today and what the function of the office would be at the modern time.

In this research, the concept and design strategies in 21st century's offices were studied. It was realized that there are new concepts and approaches to work that have been emerged in the new offices and the strategies used in interior design of these offices are related to these new concepts.

In the 21st century, a new kind of office worker called knowledge worker has appeared, and the work they do in the office is not a simple work that everyone can do it and it is hard for them to work with companies with traditional organizations.

Office organization and management has changed today from hierarchical organization to a flat organization. In a flat organization, all employees work together in the same place, and there is no manager to control them. These changes happen at offices because of employee empowerment. In a classical organization, all employees should obey the manager, but in a new organization, employees should feel free.

Employee empowerment is an important concept for new-age offices because it also brings other new concepts such as flexibility and mobility, employee health, fit to the environment, informal collaboration, and communication.

An issue which is related to employee empowerment is universal design. The office should be designed for everyone. All types of people such as disabled people, older people, children, and people with temporary disabilities like pregnant women, should use the space easily.

Flexibility and mobility have emerged to the office after wireless laptops and computers are becoming more popular. These two concepts can be seen in different types of open-plan offices, and they make open plan offices popular. Flexibility is also related to time. New age offices have flexible scheduling which means employees come and go to work as they need. To implement flexibility in new-age offices, private spaces, restaurant or café, spaces for a quick face to face collaboration, formal and informal meeting spaces, relaxing spaces provide employees a wide range of alternatives spaces to work.

Open-plan offices became common, as mentioned before, because of high collaboration and interaction possibilities, but new-age offices try to increase informal collaboration and interaction. So informal spaces such as café, restaurant or game room are designed at the office to increase informal interaction and collaboration as it is believed that informal meeting room works better than a formal meeting room.

Another type of collaboration used in new age offices is collaborative technology (CT). It makes possibilities for organizations to quickly bring together remote workers

into the virtual team to perform a variety of tasks. Companies provide video conference rooms for virtual communication.

Employee's health is another new concept that has emerged in the new age offices. Companies add some health facilities such as gym to their offices and provide employees with healthy diet information to support their health. Because they believe healthy employees become more productive.

Creating a fun culture also makes the employee happy and motivated. Happy employees with good friendship can be more efficient and more engaged at work. There are different suggestions to create fun at work, such as a karaoke room, bar, or music room to play an instrument. Also, by using different colors, materials, and furniture, the workplace can be more friendly and attractive for employees.

In new-age office layouts, different types of space such as private space for employees who need to concentrate on their work are provided. The fit between person to the environment concept is important because new-age offices are designed for people with different personalities. All new concepts which are mentioned above are appeared to support employee empowerment. Because it helps them to share responsibility, and to create autonomy.

Google offices have been chosen for analysis in this study. The first change to Google offices happened in 2005 in 'Mountain View' office. Clive Wilkinson, designer of Google Headquarter at the 'Mountain View', started to do the first changes at Google interior spaces. The office was a cubicle land as he said, and he changed all solid walls to transparent walls to make the interior more communicative. Google's new culture

believes employees need face to face collaboration and interaction more than virtual communication and they try to encourage informal interaction and collaboration more than the formal one (Camenzind & Ruegg, 2015). They provide different types of spaces for quick face to face interaction and collaboration such as booth style places or restaurant and café. Also, they have spaces for formal and virtual collaboration.

Interaction and collaboration will be faster in future offices because of improvements in technology. Development in information technology will increase the speed of the change. These changes will cause people's 'desire to belong' so, design of office in the future creates unique identities, which make the company values and culture.

In this study, it has been tried to find new concepts and strategies of new-age offices. But there is no study about the impact of these new-age offices on employees and their feeling about it because it is a very new subject and there is no study related to that. This can be an opportunity for further study. Also the categorization which has done and explained briefly can be more widened and all the concepts can be a separate subject for further study.

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