

Time Sharing: **The Multi-Functional Office**

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Fall 2009 & Spring 2010

Submitted towards the fulfillment of the requirements for the Doctor of Architecture Degree

School of Architecture
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We Certify that we have read this Doctorate Project and that, in our opinion, it is satisfactory in scope and quality in fulfillment as a Doctorate Project for the degree of Doctor of Architecture in the School of Architecture, University of Hawai'i at Manoa.

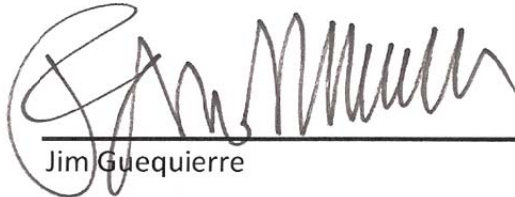
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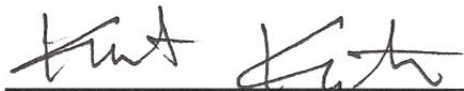
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Table of Contents

Abstract.....	005
Background.....	006
Introduction.....	007
Chapter 1 History and Current Trends in the Office.....	009
History of the Office	009
<i>Layout and Planning</i>	
<i>Managerial Strategies</i>	
The Impacts of Socio-Economical Trends on the Office	025
<i>Regional Office Comparison</i>	
<i>Culture and Diversity</i>	
<i>Economic Depression and Expansion</i>	
<i>Flexibility and Mobility</i>	
<i>Socially Implied Space</i>	
Chapter 2 Procedural Attempt to Solve the Current Problems.....	039
Defining the Office through Workspace and Statistics	039
<i>Conventional versus ‘The New Office’</i>	
<i>Workplace Survey (WPS) and ‘The Four Work Modes’</i>	
<i>Workplace Envisioning (WE) and Time Utilization Studies (TUS)</i>	
<i>Workplace Index (WPI) and ‘The Four Work Modes’</i>	
<i>Post-Occupancy Surveyed</i>	

Chapter 3 Design Attempt to Solve New Workplaces.....	058
Case Studies	060
<i>Completed Projects</i>	
<i>Flexible Furniture</i>	
Chapter 4 New Design Solution for 21 st Century Offices.....	102
Multi-Functional Spaces	102
<i>Utilizing and Combining through Timesharing</i>	
<i>New Ways of Thinking</i>	
Conclusion.....	115
Table of Figures Cited.....	118
Bibliography.....	122

Abstract

The purpose of my thesis is to create and develop a new office layout that meets the needs of current and new office trends. However, this thesis is *only* the starting point of my career in understanding how office design improves employee productivity and work efficiency. By applying current research to office design improvement, this space planning layout will benefit trends in modern technology, innovative projects and global development and relations. My goal is to improve current and new office designs with key components found in society.

The objective of my study is to improve conditions found in offices where limited square footage and space planning is a major factor in the design. As a result, the Multi-Functional office will look at current workplaces that encourage new space developments to improve conditions that are imposed by limited office space.

Once the real estate is acquired by the client, the architect has to satisfy all program requirements in addition to building and egress codes. However, designing an office layout that improves efficiency and enhances productivity is challenging. Therefore a comfortable work environment should keep one important factor in mind – the ‘Human Factor.’ This is the point where my thesis begins.

My intention is *not* to write a book of codes or explain how past office designs could be improved. Rather, I want to stimulate creative thinking within the office layout that would be appropriate for tomorrow’s workplace. This new type of space planning may or may not be 100 percent practical in specific industries found in the present day office environments, but we can assume that the new design in the office will create awareness of current problems and challenges found in the workplace. This thesis includes a perspective on alternative workplace strategies and innovative office design for better and more efficient use of space.

My research is not advocating a specific office layout. This intended design is the starting point for new ways of looking at the office and is not directing clients and/or architects to follow this space planning precisely. This office layout does not apply to all places of work and/or specific types of office industries. I believe this is a new strategy that presents a new way of thinking.

The methodology used is a combination of several types of research methods. The two main methods are Interpretive-Historical and Qualitative research. Interpretive-Historical is based on facts, i.e. archived, records, books, on anything related historically.

Qualitative research method comes directly from current information that is found in interviewing, observing and surveying people. This research method is used to understand and analyze specific trends not found in the past. When comparing the past

to current trends, we can learn how certain decisions and facts improved or failed in the office environment. Some of the information in this methodology was collected through research conducted by various companies and/or industries that strive to improve the workplace with alternative solutions.

Background

The characteristics of the office can be demonstrated by the history of the office. In past years, the office has undergone different variations of two traditional office types. From office culture to diversity, the work environment has created a new breed of office experience.

“The office as we know it today is a relatively new phenomenon. It dominates the working lives of hundreds of millions of people yet it dates back little more than 100 years. As the physical setting for the necessary functions that support industry, business and government, the office can be described as one of the key societal landmarks of the 20th century. The office in the 20th century followed the now well-understood path of modernization and technological advance. One hundred years ago, the dawn of a new century acted as the catalyst for a cluster of new inventions – among them the light bulb, elevator, telephone and typewriter – that revolutionized the world of work within dedicated office buildings” (Myerson and Ross 2003, 08).

This quote defines the essence of the office from 100 years ago up until the 20th century. The evolution of the office is clear as modernization and technology have changed the course of office use. Today, we have entered the 21st century where mobility, flexibility and globalization have become factors in our daily life. So, the initial question is, “How do we respond to these apparent measures? Do we adapt to change or change our surrounding around us?”

Introduction

Over time, the office has evolved. The evolution of the office has provoked new ideas, technology and global communication that was limited prior to the 21st century. In doing so, offices in this decade are different. In order for offices to become successful, office design should adhere to recommendations from the client(s) as well as suggestions from the employee(s). A successful office could be realized.

Through organized schedule of time, flexible space planning and furniture incorporating versatility in various task work, would be the definition for the multi-functional office. It will take shape while improving office functions relating to the employees' use.

The first key aspect is flexibility of space planning. Whether it's a portion of the office or a particular space, the furniture layout should imply flexibility of design. Space implies specific use or characteristics. In many offices, such spaces are multi-functional meaning spaces are used for various activities, although they weren't meant for that.

The second aspect is driven from current social applied spaces. Offices that create areas of enjoyment or relaxation have seen positive effects on employees' work behavior. Offices include social and/or rest areas in order for employees to relieve stress at any given time. Studies have shown social areas have created better results in employees' concentration than offices without social spaces.

The last essential aspect that will increase over time is mobility. As mobility and flexibility are joined; they have similarities to current office trends. With this, mobility offers a common goal in the workplace, which is office comfortable while on the road. That goal is to develop a workplace suitable to the employees who are constantly mobile, while creating flexible furniture for various tasks.

The following chapters in this thesis build upon the argument that current offices are in need of change. These changes will show design patterns that improve employee satisfaction in response to office environment. Through current office trends we can identify problems and challenges, while understanding how successful offices are being used. This will generate results that will illustrate multi-functional space planning.

Chapter 1, "History of the Office," describes the office evolution from the 1900s to today's office types. Through types of offices, divisions of space were created in regards to managerial roles and other aspects that re-interpreted how offices were being used. In addition, "The Impacts of Socio-Economical Trends on the Office," examines certain events that have impacted offices in past decades and re-defined the office through change in society and economic trends, which is the foundation to new office developments.

Chapter 2, “Defining the Office through Workspace and Statistics,” is a composite of surveys conducted by different office industries to show why new office design is important, compared to conventional offices layouts. Through satisfaction, productivity, and efficiency, the office workforce demonstrates its needs and importance for 21st century design.

Chapter 3, “Case Studies,” are precedent studies of past and current ideas that lead to new ways of thinking. Through these results, new office trends can be identified. The case studies demonstrate how improved design makes a difference in their office.

Chapter 4, explains how “Multi-Functional Spaces,” are designed using a step-by-step process through the early stages of the new office project. By creating multi-functional spaces, the step-by-step process is an alternative solution for 21st century thinking.

My goal is not to advocate a set office design layout, but to provide awareness about current problems and challenges in today’s conventional offices. After reading this, you should have a new mindset, and perhaps a new way of thinking, that could lead to innovation and, potentially, have more awareness of office space planning. These solutions aren’t a set of rules to follow, but the basis for new and innovative ideas that could potentially change the workplace. It’s the starting point for one to view offices in other ways.

Chapter 1

History and Current Trends in the Office

History of the Office

The office has always been a place of business. By definition, the office, according to Merriam-Webster, is “a place where a particular kind of business is transacted or a service is supplied.” (Merriam-Webster Incorporated 2009). The office is a sanctuary where individuals work as a collective, to benefit and service a business or company.

According to the U.S. Census Bureau (2006), more than 60 percent of the population in America works. Whether an individual is self employed or working for someone else, approximately 50 of the 60 percent surveyed works in an office environment. To define the number of people satisfied in their workplace, we have to first define the office.

The office is more than a place of work. Architects and designers have spent years creating workplaces that are well-balanced, comfortable and support the company’s managerial style. Through observation and research analysis, people inhabiting the space experienced pleasures and/or disappointments.

This chapter familiarizes the reader with the office by its physical nature. The basic entity of the office is to describe the types and how offices were managed in past years.

Office Styles Influenced by Layout and Planning

The most common office types are the Corridor Office and the Open-Plan Office. As the two most popular types, each has become an iconic office type to follow. Although the date is unknown, it is said that both types were invented before World War I. Although the Corridor Office gained popularity first, different versions of the Open-Plan-Office are seen more often today.

The **Corridor Office** consists of long corridors with rooms on one or both sides. These rooms consist of single to multiple offices divided by fixed walls. Each room in this corridor can be designed differently, depending on the relation of employee status to functional purpose. Generally, each room has direct window access for ventilation and natural lighting. The main advantage is privacy, since each room has fixed walls, in which overlooking, peeping, and over-hearing are prevented.

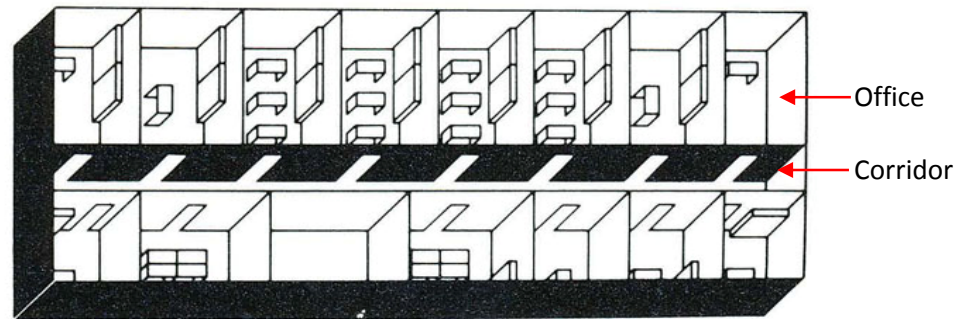


Figure 1 the Corridor Office (Duffy 1992, 8)

Not everyone needs an individual office, and not everyone will get one. Rooms could be shared, although concentration becomes more problematic. Supervision is challenging, since employees could stop working at any moment, decreasing productivity. Equally critical as supervision, communication from one private office to another is a problem; people, naturally, communicate less if they are not in hearing distance. They don't want to have to get up out of their chair and move through the boundaries of two doors, in order to reach a colleague. Internal memos or telephones, therefore, became the primary means of communication. These forms of indirect communication are always inferior to direct communication, face-to-face. Communication by indirect means can lead to miscommunication and/or delays. It becomes a scavenger hunt for those passing on messages, letters, and/or memos. This time-wasting behavior would be better spent on issues and tasks related to work.

"The primary disadvantage is wasted space. Space is wasted in most areas of the Corridor Office; i.e. the corridor, the corners of each room, as well as the space behind doors." (Worthington 2006). If the company expands, fixed partitions become an inconvenience. Cost to install, remove, and/or replace materials becomes expensive.

Before and during the 1950s, this office type was also called, 'the Traditional Cellular Office' in Europe; it was the basic office type. While the Open-Plan Office began to emerge, European companies were reluctant to approach America's style of deep office layout, because deep office spaces have insufficient natural lighting and ventilation. The cellular office had better natural lighting, and less air conditioning was wasted, so the cost of daily needs was reduced. Many European offices were designed in this style, since their buildings were typically long and narrow.

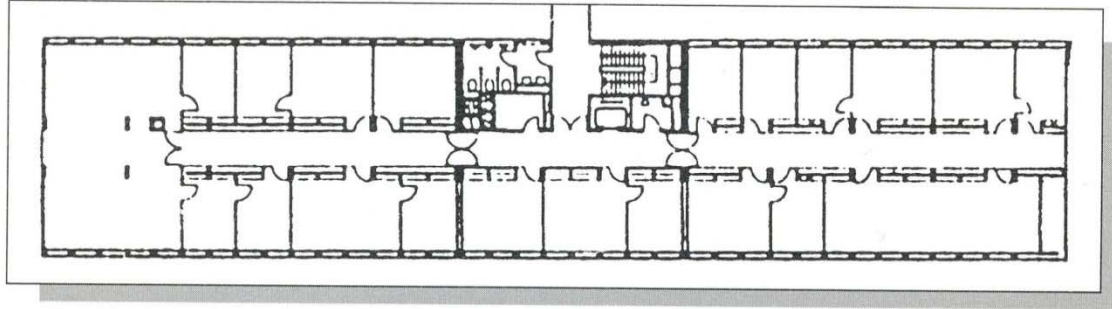


Figure 2 the European Corridor Office (Duffy 1992, 8)

Today, the Corridor Office type is most commonly used for dividing spaces to rent. A single floor could have multiple office spaces available for businesses to rent or lease. Separate spaces are divided at the core of each floor to give building owners the flexibility to rent and/or sell space to different companies. In large companies, entire floor(s) are used to accommodate the clients' needs. In addition, corridor offices do not provide the flexibility that companies are seeking, nor the ease in managerial setup needed to sustain a productive and efficient work force.

Open-Plan Office, also known as deep space office type, is the alternative to the Corridor Office. This office type is typically associated with staff assigned to performing routine tasks, and/or with lower or medium status. Work in this office type will have artificial light and ventilation. Due to its deep floor plan, natural lighting does not penetrate far into the building's interior. Windows and ventilation in large spaces require more energy.

The advantages of an Open-Plan Office are the ease of communication and supervision, and work flow organized by specialty and/or skillful people arranged on the office floor. Changes to the layout become easier to implement than corridor offices.

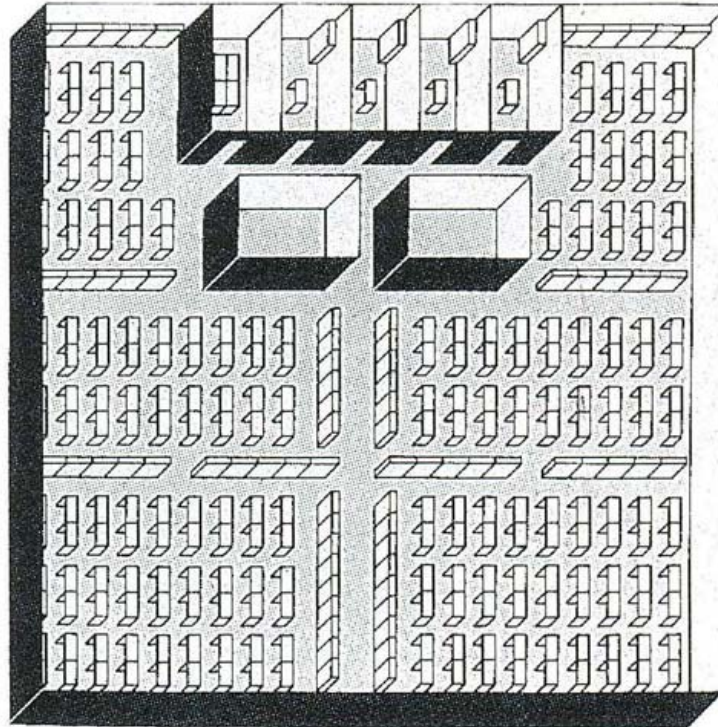


Figure 3 the Open-Plan Office (Duffy 1992, 9)

The disadvantages are system furniture and its set pattern of rows and columns. This system of organization is “disliked and considered unfriendly by staff below supervisor level.” (Duffy, *The Changing Workplace* 1992, 09). Also, supervisors are not eminent and blend with lower staff. Distractions become apparent in open spaces. Whether its noise or people-watching, employees will not concentrate on tasks. Privacy is the key point that Open-Plan Offices are missing – personal and public spaces are not delineated; people can hear and/or see your business, both personal and work related. There are no barriers or partitions to contain sound.

The primary reason why Open-Plan Offices are seen often today are associated with cost. Since this office type involves less construction; cost gradually decreases in comparison to the Corridor Office type. Open-Plan offices provide more design flexibility than corridor offices, resulting in less wasted space.

Burolandschaft Office or ‘office landscape’ type was developed in the late 1950s by a group of German researchers, called, “the Quickborner Team.” In response to America’s Open-Plan Office, the Burolandschaft office type was considered the new and improved version. Although it was developed for German offices; this office type stormed its way into other European countries. Eventually, the Burolandschaft office type was changed to, ‘Office Landscape.’ The Burolandschaft’s office type, “proved to be effective, flexible

and more acceptable than either corridor offices or open-plans.” (Duffy, *The Changing Workplace* 1992, 10).

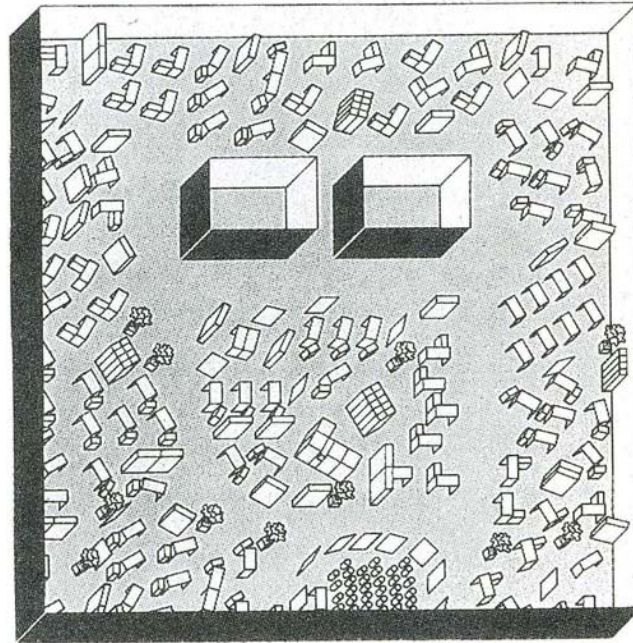


Figure 4 the Burolandschaft Office (Duffy 1992, 11)

The concept was to create an office with no straight lines of sight. This would create unorthodox spaces uncommonly seen in previous office types. This office type created a disorderly style of organizing divisions or groups of people, by means of partitions or office furniture with minimal or no fixed walls.

The office design was to create a spacious open floor plan that could accommodate enough people without the feeling of being constricted. This approach was through arrangements or randomness of office furniture. Through the random placement of furniture, natural lighting can be seen further in. Noise levels are lowered through absorption of the materials provided; i.e. partitions, and different furniture types. The material choice is carefully considered to enhance employees' comfort in the workplace. Conference or private conversational areas are arranged meaningfully with office furniture and partitions.

However, some of the problems in the Open-Plan Office re-occurred. Individuality and personal privacy was lost, while the statuses of upper level employees were mixed into the floor without any visible rank to show. Noise and distractions still occurred even in Burolandschaft's office layout.

“The essential promise of Burolandschaft was that ‘it seemed the closest approximation to a service which it was felt architects and interior designers were failing to supply –

the detailed planning of interior space by people who understood something of design and organization structure’.” (Worthington, *Reinventing the Workplace* 1997, 29). What happened later; Burolandschaft’s ‘office landscape’ became a disaster in disguise. Refer the Burolandschaft Revisited after Herman Miller’s ‘Action Office’.

Herman Miller’s ‘Action Office’ or AO was subsequently established during the peak of Burolandschaft’s office popularity, in North America. Robert Probst, who in 1960 became president of Herman Miller Research Corporation USA, redefined the approach to system furniture. Probst stated that “today’s office is a wasteland.” (Herman Miller, Inc. 2009), and developed the Action Office System for Open-Plan Offices in America. In 1964, the first modular system furniture was designed with assistance from the office of Jack Kelly, who from the 1960’s to 1970’s played a vital role in developing the components for the Action Office System Furniture. (Jack Kelly was a designer for Herman Miller for 40 years, and assisted Probst.) Their design, Herman Miller’s Action Office Systems, is pre-fabricated furniture kits responding to various task and office work. This approach permits discretion of employees' independence. In addition, the components of the system furniture could provide the company with flexibility to change or replace different items depending on specific needs and/or tasks.

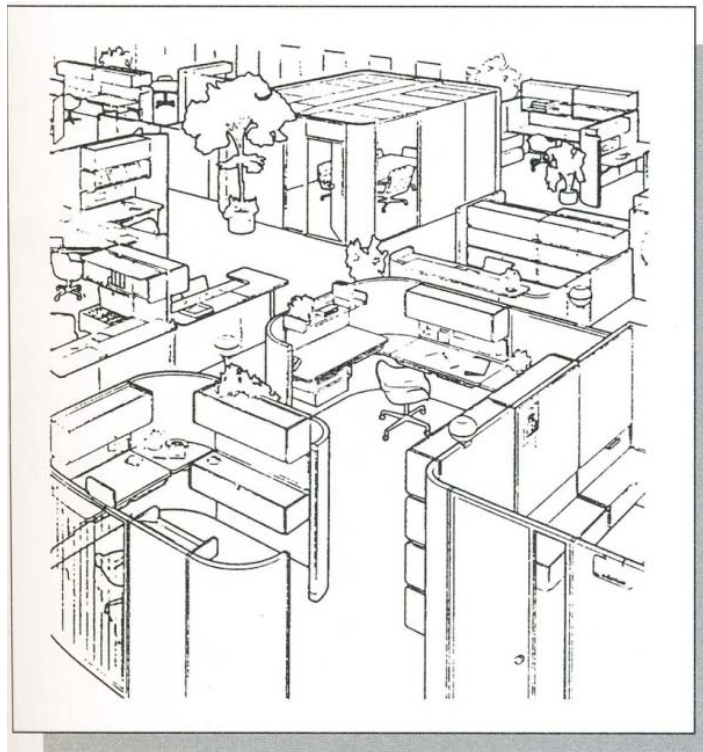


Figure 5 the Herman Miller's Action Office (Worthington 1997, 29)

Burolandschaft Revisited is a term used by Francis Duffy who analyzed Burolandschaft’s office type through the 1960’s and 1970’s. In his book, *The Changing Workplace*, Duffy shows the downfall of office landscapes after 1975. *Burolandschaft Revisited* is an assessment of critiques made by several individuals and associations in early 1975 about

the original office type. Duffy, among Colin Cave and Sutherland Lyall (*editors*) from Architects Journal UK, published the article about this office type. After 1975, “Burolandschaft could never again be seen in the same light.” (Duffy, *The Changing Workplace* 1992, 64).

“On a side note, Francis Duffy is an acclaimed Architect, who played the leading role in researching and practicing effective and productive ways to improve the workplace environment. He wrote books and articles, in regards to future office thinking and ‘effective, efficient, and expressive use of workspace’.” (DEGW plc 2009).

Within a decade of Herman Miller’s Action Office being created, Burolandschaft was gradually becoming the least popular office type in Europe. Burolandschaft Revisited proved that it was not the ideal office type. By the 1980s practically no one had heard of this ‘office landscape’. This occurred after several articles were published by Francis Duffy and several others responding to the misuse of furniture in the office space.

One problem in particular refers to the managerial style in running this type of office. In many UK offices, a new managerial style had to be adopted due to irregular design; this, among other things, instigated arguments within large companies where the rule book is uniform internationally. Once the layout was constructed, the managerial role had to be set in place; there was no turning back. So it became challenging to adjust managerial roles, especially in the case of employment changes or modifications. Eventually, the client encountered challenges in modifying management, since the office layout was crystallized. Managerial styles evolved to improve work efficiency. However, the office layouts lacked the versatility to keep current.

The status and hierarchy of employees was traditionally used in determining the layouts of American offices. In past office layouts, the hierarchy of employees meant organization, structure, and order; this followed the managerial style of the time. People of high rank were insulted by this design of egalitarianism, because it conflicted with their position in the office. The office landscape did not impact American businesses as it did European businesses.

As this office layout was revisited, furniture was fixed onto an unorthodox position. The office furniture was intended “to be light and portable with minimum storage attached to the workstation and proper provision for filing elsewhere.” (Duffy, *The Changing Workplace* 1992, 73). Partitions were used incorrectly, and furniture replaced partitions as walls in others. Most companies did not purchase appropriate furniture intended for this office; the furniture was the opposite of what was intended; companies were forced to move employees, rather than furniture. Herman Miller’s Action Office (AO) responded to the negativity the office landscape was projecting, and became popular in America and UK.

The allure of Burolandschaft’s office type provided specific methods for designing a new type of office. That illusion refers to the limitations of office furniture and further developments in expanding or decreasing employment within the company.

Burolandschaft's office type may have not been developed to the point in which companies could benefit from this layout. Although this concept was an amazing discovery and was popularized in offices in Europe, it did not have the flexibility employees needed to function efficiently. Perhaps this office type was impractical or too problematical to be used; however, if it had expanded its furniture choices or used building services in a more refined manner, and adapted more managerial styles, this office type would have been the ideal workplace.

The **Collective Office** or Combination Office type is a fusion between the Cellular Office and the Open-Plan Office. During the late 1970s, designers from Sweden developed the Combination Office Type. This approach kept "private cells grouped around a common space." (Harrison, Wheeler and Whitehead 2004, 13). In the 1980's many office buildings were constructed with this hybrid office layout. This method of surrounding the common space with fixed rooms taking up window edges was the solution in response to today's trends.

The intent was simple – to improve a certain amount of privacy, while providing managerial employees individual rooms. These individual rooms would be visible from the common space. The common space was a place where meetings were held, in addition to the main work force. Today, this office type of combining elements from the Cellular Office and the Open-Plan Office has gained popularity.

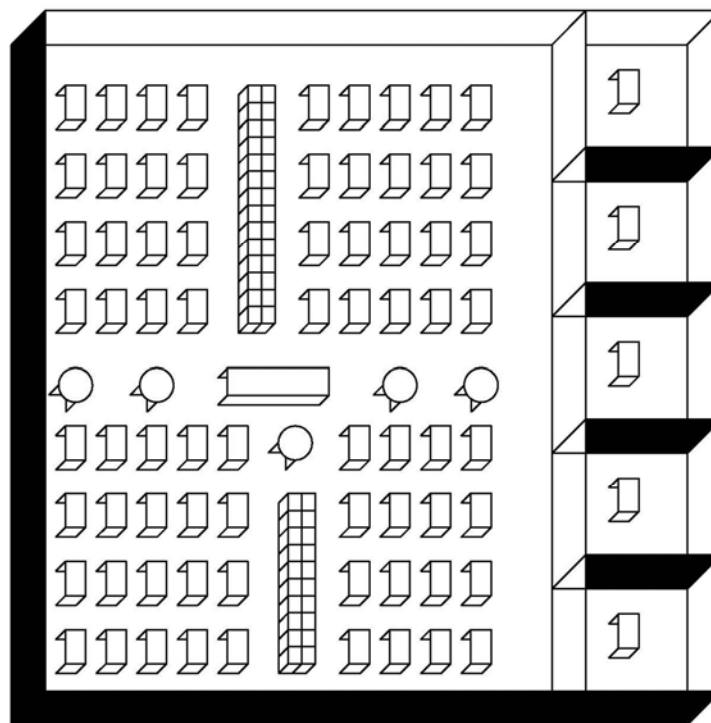


Figure 6 the Collective Office (Ryan Yee)

Although this Collective Office type is widely used today, hybrids of this office type have been designed in many offices. A key aspect comes from the flexibility in designing

partially enclosed and open spaces into a variety of forms to fit in the office floor plan while meeting the company's needs. The adaption of this layout has created new ways in designing an office in today's market.

Throughout the past century, architects and designers have been trying to develop and create a 'new office type,' to stay current with the evolving needs of their clients.

One can assume that these office types do not apply to all industries in the office or every business. Rather, these office types would be the foundation from which architects and designers could learn.

Today, we try to design workplaces around offices that fit into the client's model of work habits. Depending on office industry and business, offices are used differently from each other, therefore productivity and efficiency would have to be customized specifically to that work environment. (Chapter 2 explains how surveying employees can benefit the new office environment, while increasing job satisfaction will produce better results in productivity and efficiency in the workplace.)

The Multi-Functional Office adapts past office types found in today's workplace and creates a better use of space by applying new furniture type and rethinking how spaces are used.

Unlike Burolandschaft's office landscape, total change doesn't occur overnight. This office type has drastically changed the way we use workplaces and how we adapt to the office. Herman Miller's Action office was successful due to its gradual adaption to the popular Open-Plan Office type. Without total change, the Action office was an improvement on the Open-Plan and how we use it. Although both are successful when used correctly, the Multi-Functional office adapts to the collective office type, where adjustments to office furniture and space improves how we use them.

Office Styles Influenced by Managerial Strategies

In the office, rows and columns of desk were arranged to adjust to the managerial style of the business. Furniture was organized in such arrangements depending on work task. Some of the popular associations of space were derived from the first divisions of office organization. These organizations of furniture have been recognized as specific form of managerial office layout. They presented in figure 7.

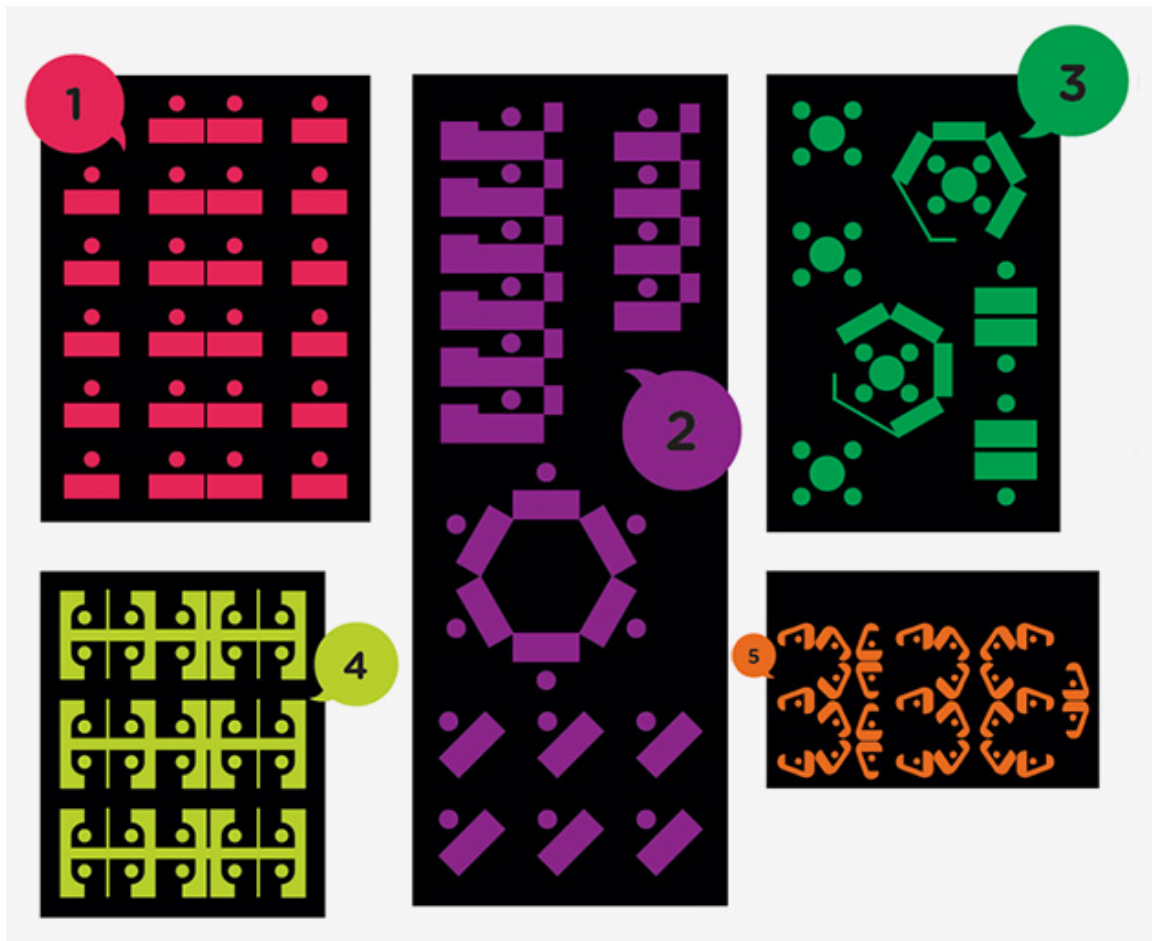


Figure 7 the Evolution of Managerial Styles in the Office (Kuang 2009)

1) Taylorism 2) Burolandschaft 3) Action Office 4) Cube Farm 5) Networking

The image above visually shows the evolution of managerial types within the office. From Taylorism to Networking, the role each office type played corresponds to when these office spaces were implemented.

“Taylorism was created by American Engineer Frederick W. Taylor in 1911, in the article ‘Principles of Scientific Management,’ Taylor devised the means of details in division of labor in time-and-motion studies and performance through the wage or income.” (Kuang 2009).

“Taylorism was the dominant management philosophy when the large urban office building was developed in America a century ago, and Taylor’s Value – order, hierarchy, supervision, and depersonalization – became integral principles for American office design. This once radical mixture became so successful that the model of clustered furniture has proved remarkably resistant to change.” “Today, this is still the basis for American office standards.” (Grech and Walters 2008, 42).

Taylorism had a strong influence on American office culture. A comment made in an article by the architectural firm, Gensler refers, “to the two generation groups of people that had the most association with this office style. Veterans and Baby Boomers had strong ties to this office organization, by its familiarities to lifestyle of the time and physical attributes the managerial style created.” (Kirkpatrick, Martin and Warneke 2008).

Burolandschaft was a style that competed with Taylorism during the late 1950’s to 1960’s. Before this, the office was based on an organizational rule of management. When this office type debuted, it signified the defeat of Taylorism and all aspects of hierarchy and order. This distinct method of non-order and equality changed the way we worked in the office. Burolandschaft’s office layout didn’t adapt well and created more difficulties than solutions. What became the most popular office type in the 1960’s is not seen today.

The **Action Office** debuted at the peak of Burolandschaft’s office type. The concept was to develop component furniture that could be tailored to the different needs the employee and/or company desires. The Action Office responded to the disapproval of the Burolandschaft office layout, while keeping the values of Taylorism such as communication and privacy.

Today, the lesser version of the Action Office is being used called the cubicle. The cubicle is the generic version of the Action Office, modified by different furniture companies in response to different tasks, office industries and functions. The popularity of the cubicle created new problems, also known as the Cube Farm.

Cube Farm popularized as the Baby Boomers were entering the workforce and the concept of the cubicle had surfaced. More employees were getting promoted, creating a position not ranked enough to receive a private office and not low enough to be of junior status. This massive class of people produced the term ‘sea of cubicles.’

Some of the apparent problems led to the identity of the workplace and the people who work in it. The Cube Farm lacked the control in maintaining productive employees, creating a decline in job satisfaction.

In the comic strip Dilbert, created by Scott Adams, the main character Dilbert is portrayed in such humor that highlights the essential problems in offices today. Although his work is fictional, Adams interprets office problems with humorous analogies, while relating it to the audience. Dilbert and co-workers say and act parts that real-life company employees want to express. This relationship to the reader impacts how we think and act in the workplace. “Even the most conservative companies we deal with recognize the Dilbert-type issues,” says Paul Siebert, director of Workspace Futures at Steelcase.” (Steelcase 2006, 3).

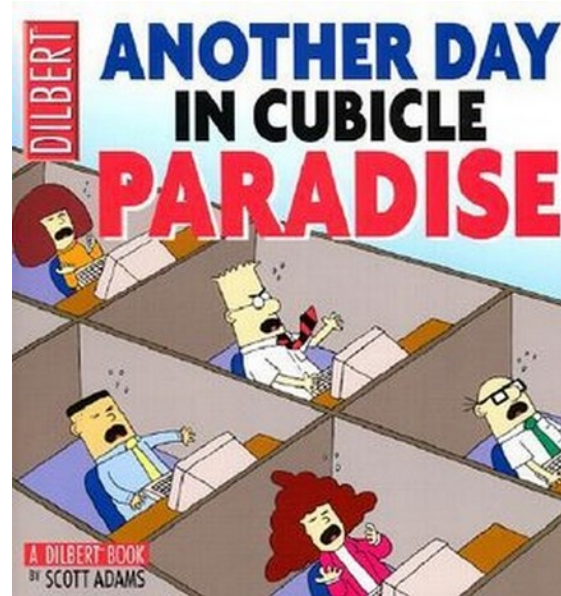


Figure 8 Dilbert Comic by Scott Adams (Adams 2006)

In this comic book, “Another Day in Cubicle Paradise,” Adams portrays Dilbert and fellow comic characters as the disillusionment and dissatisfaction of people working in the sea of cubicles. Within the office humor, emphasizing job discomfort, low use of thinking and productiveness, and efficiency to work has led to numerous acts of weird behavior depicted from real events. Some of the problems represented in this book are direct negative interpretations of the Cube Farm.

Over time, the Cube Farm created one apparent problem that encouraged new ways of designing office furniture. In the 1990’s ergonomics in office furniture became a major trend, since people were developing more symptoms of work related stress, which originated from unfit workspaces and improper use of furniture.

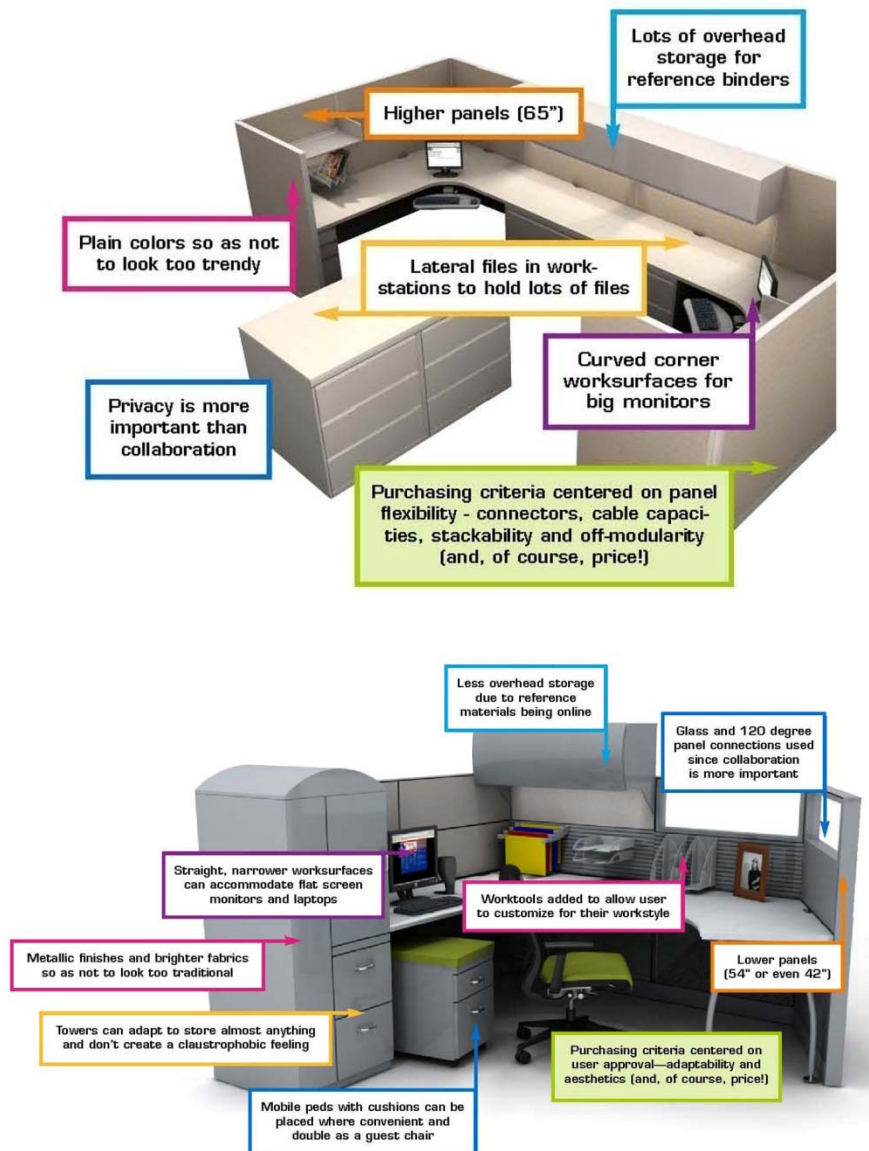


Figure 9 the Evolving Cubicle portrayed by Steelcase; (Top) 1998 and (Below) 2005 (Steelcase 2006)

What we see in the office today are the new and improved versions of the original cubicle. A furniture company, Steelcase and its researchers found that the new cubicle has transformed into a better workstation for individual work task. In comparison to the 1998 version, the cubicle improved in material, color and visual response to office environment. "As the initial employee workspace gets smaller" (Steelcase 2009, 5), the change in cubicle function will foster new solutions creating a better environment for increasing use of collaboration and social related task work. Comparing the two images, enhancement in panel height, overhead storage space reduced and mobile cabinets are some of the diverse innovative ideas current cubicles offer. The changes made in the system

furniture from 1998 to 2005 show that technology, ergonomics, and aesthetics play a vital role in the necessary change to adapt to current trends and ideals practiced in today's offices.

[One of the changes that impacted office design was the use of desktop computers. Among other things, this technology had an impact on everything from office layout to system furniture design. With cables and wiring feeding into each cubicle and workstation, office layout became more modularized than before. One could argue we are designing around the electrical outlet, rather than the human being.]

The **Non-Territorial Office** was developed as a result of change in the IT branch, in the late 1980's. The concept is that this office type is adaptable to any office form, while increasing productivity, developing teamwork, and implementing cost savings. It is suggested that the design would improve efficiency and acceptance in layout by employees. One could call it a hybrid office environment. This office type is closely related to the Reversible office and Combi-office types where combination of enclosed rooms and large open spaces create a flexible environment with standardized equipment and furniture are used. This office type evolved the use of office furniture by creating unassigned workspaces with community or group space integration. Some speculate the primary function of this office type was to create shared spaces and use of mobile computers, which developed the common term, mobile employee.

The **Virtual Office** was an attempt to create a new office layout that would keep employees mobile, without providing a permanent workstation. This brief attempt in developing a new workplace design was developed by the company's CEO of Advertising Agency called TBWA\Chiat\Day (the Venice, California headquarters) a 'Clubhouse' concept that Architect Frank Gehry employed. (TBWA\Chiat\Day will be explained further in the Case Studies chapter.)

The Virtual office could represent the mobile office – a virtual place of work that travels with the employee, and an ideal place where the employee could plug in and work at different locations, different environments and at different times. The virtual office is the breakthrough needed for mobile employees. Wi-Fi, Blue Tooth, and 3G (Third Generation) networks are some of the technologies made possible for mobile employees to communicate and work from.

Networking is widely used at the end of the 20th century, especially when computers became one of the important factors in the workplace. Networking is done through the virtual office by use of the Internet, electronics, and high-technology offering rigid design base around the outlet. Since the outlet and cable restrict movement of system furniture, they would be designed with these components in mind. What you see today is system furniture evenly spaced on floors, by walls, and under ceiling outlets.

Networking is not an office type, it is an object used in the office that defines placement of cubicles and/or furniture spacing. Networking became a trend as

technology was required to do daily work. Eventually it became mandatory for businesses to include high-technology in their offices (i.e. computers, telephones, copy/fax machine, etc). During the late 1970s businesses incorporated networking, by the late 1980s, 60 percent of all American businesses had these capabilities. Today, more than 90 percent of all American Offices thrive on the 'plug'.

Although we have limited the amount of movement office furniture use in the virtual office, the office is evolving. In the early 21st century, popularity of this recently device has change the way we use the office, it is called 'Wireless Technology'. This revolutionary technology improves workspace where clunky wires do not interrupt the workspace. Familiar names such as Wi-Fi, Bluetooth and ZigBee are some of the devices used to connect (via wireless) businesses internationally and/or locally. Mobile employees can communicate with businesses while on a plane, in a restaurant or in another country.

The Multi-Functional Office by definition should mean flexibility in office furniture and space planning should not be restricted. The new office type should be flexible to task work, group work and other functions in which the corporation or business is engaged. Each business interprets multi-functional spaces differently, depending on its needs and desires. Whether the function is limited to different times of the year, or job schedules in the month, the office or specific spaces in the office should conform to human tasks. There have been ideas and solutions found in innovative office furniture, to re-interpret how we use space and for what purpose we could use them for. Employees use office furniture for different purposes unintentional to their function. Therefore in Chapter 3, the new office furniture is multi-functional to the unintended task it receives. Thus, organization of managerial style should not be affected if spaces can adapt to different usage while maintaining similar organizational patterns. Unlike Burolandschaft's concept, the Multi-Functional Office could be limited in adjusting small areas to large rooms, without drastically altering the managerial style.

Conclusion

Design is an important factor in offices today. As a result, Burolandschaft's office type made companies and employees realize this office environment is too challenging to maintain. The downfall of Burolandschaft's office design became eminent. As architects and designers, we must understand how different industries organize the office and how certain office types work best in specific settings. This approach was realized when the Action Office type replaced the defective 'office landscape' by introducing system furniture. In a short time, the Action Office furniture system became accepted, but over time new developments in managerial styles caused more problems in the action office than expected. Such is the case with 'the Cube Farm.'

The next section demonstrates how the office was affected through socio-economical trends that forced change in working styles. Through lifestyle changes in history and present day findings, we have created new awareness in office design. Currently, we understand these issues and problems that have influenced change in the office environment. Through these social and global impacts, the office types and managerial styles in the workplace changed in value. What was once common in the workplace has become less valuable over time, due to socio-economical impacts, popular and new advancements in the workplace will change how we work or use the office.

The next section also examines how new developments in the office have created different problems that are being realized in today's design. And what we are looking for in tomorrow's design by effects in today's office problems.

The Impacts of Socio-Economical Trends on the Office



Figure 10 a Comic Humor by Mark Parisi (Parisi 2009)

We enter the workforce with education and knowledge concerning our job and career. Subliminally, we were absorbing work habits while at school. During our adolescent childhood to young adult age, we learn to sit in rows and columns apart from each other and are ordered to behave to strict rules and regulations conforming to office-like characteristics, while our creativity is not developed when we are in school. We learn to sit in individual desks and look forward while taking notes for an upcoming test. "In this comic relief shown above and a lecture recorded by ted.com one theory could show, 'that school is the hierarchy rooted on two ideas.' Number one, that the most useful subjects for 'work' are priority in all schools worldwide," i.e. math, English, science. "Number two, schools are focused on such subjects that back up" (Robinson 2001) what we believe will help us be successful in the workplace. Based on these points, the school system is the first major impact to the office and how we perceive and identify the office environment. Our misguided use of not nurturing creativity hurts our sense of resourcefulness in real life situations; where design could potentially improve our work behavior and job satisfaction. One thought to consider is that schools could be the first cause of interpreting office use and how we use them, our habits in school transfers to the workplace.

As we face new challenges in the workplace, we begin to comprehend how certain trends impact the workplace. In case of Burolandschaft office type we understand that individual and group spaces are widely joined with no separation of walled areas. In that regard, the Combination Office type makes clear distinction of each area by use of combining spaces in the corridor and open-plan office types. Regardless of what has been invented or reinvented, the current workplace is failing to provide what employees

need. If we don't identify the problems now, it will be a challenge for us to design and create an office suitable to the needs and solutions of tomorrow's problems.

This chapter will define key global and social trends that are triggering problems in the office, while identifying problems caused by current issues. This chapter will identify past, current and potential economic and social effects to the office workplace that identify potential solutions for the Multi-Functional office.

Change in the Workplace

"The office in the 20th century followed the now well-understood path of modernization and technological advance. One hundred years ago, the dawn of a new century acted as the catalyst for a cluster of new inventions – that revolutionized the world of work within dedicated office buildings. Many of these buildings were high rise, the result of new construction techniques, and set in expanding city-center business districts, but what of the 21st-century workplace." (Myerson and Ross 2003, 08)?

In order to design 'the 21st-century workplace,' we must understand what problems and challenges produced obsolete offices.

The office has taken another shape, another form, since 1997. Some of the impacts the workplace came to experience are the social and economic factors of the office culture. These changes in office culture have produced new managerial styles and alternative office designs. With all these factors involved, the once distinct American workplace has developed a catalyst of constantly redefining itself.

Regional Office Comparison

Efficiency drives cost down; the cost of square footage to occupancy is the driving force in renting, leasing and/or purchasing office spaces today. It is the management cost of office spaces while securing demands of 'fitting out' cost. The primary reason for purchasing square footage in some cities is the number of occupants to total number of square footage. This common trend for most cities around the world is uniform. Although in some regions, offices are purchased for different reasons.

Cost varies depending on location. In Duffy's book, "The New Office," studies show that the means of office use is different throughout region or continents. "Comparing three regions in particular; the North American office, the North European office and the Japanese office, there are differences in effectiveness and efficiency through common regional aspects." (Duffy, The New Office 1997, 48).

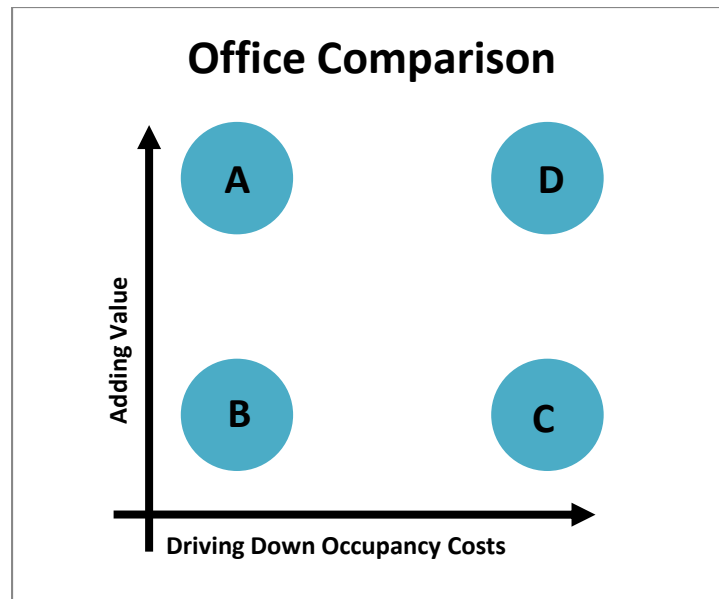


Figure 11 the Office Comparison (Duffy 1997, 48)

A) North European Office
C) Japanese Office

B) North American Office
D) Future Office

This study was conducted in the 1990's to examine different regions and the ratio of value to occupancy cost. The North American office (B) tends to overestimate efficiency, thus creating a bare minimum in value to occupancy cost. The Japanese office (C) has high real estate rates; therefore the office is occupancy driven. Contrary to this are North European offices (A) adding more value means higher effectiveness was considered over efficiency. The North European office generally prefers office support morale, and creating value in performance.

Theoretically speaking, offices should be where The Future Office (D) is located on the chart. We need to balance the two in order to have effective and efficient spaces. In today's office, one can get a glimpse of Future Office in such high density cities around the world. Where effectiveness meets efficiency, high density cities embrace this concept better. In such cities as New York, Tokyo, London, Hong Kong and Dubai, the cost of square footage and value are relatively tight.

This office comparison could be interpreted another way; like in many regional offices, respect toward regional culture is important; managerial roles in North American businesses won't necessarily work in Japanese businesses and vice-versa. The relationship to regional environment must be present in the branch or office at the other location. This theory pertains more to the American and European office types. These office types are typically large and more spatial. Offices in Hong Kong, Seoul and Tokyo are typically more expensive per square foot. Employees in American and European offices would be uncomfortable with tighter workspaces in East Asian regional

offices. Certain regional managerial roles and office design must retain regional influences to keep 'sense of place' and character of the office branch.

Culture and Diversity

Throughout the decades the office has become diverse with employees hired, based on qualifications rather than skin color. America has seen an increase of employees with multi-cultured backgrounds and gender, especially in populated, high density cities. The benefits of interracial and intergenerational offices have created innovative, diverse, and new adoption of work styles that were once specific to certain regions. When combining certain cultural and diverse managerial roles or business techniques, studies have shown improvement in business affairs, whether its office efficiency or employee productivity and that culture and diversity of employees can produce positive results.

Four Generations of Workers

In today's workforce, the staggering number of employees working past 65 is overwhelming. One could assume that retirement does not provide the same benefits as it once did, or that aged employees cannot retire due to current income and/or other factors.

With the next generation of young adults entering the workforce; "we are looking at four generations of people working in one office." (Kirkpatrick, Martin and Warneke 2008). They are the Veterans (born in 1920-1942), Baby Boomers (born in 1943-1960), Generation X (born in 1961-1979) and the Millennial (born in 1980-2000). The office layout accommodating one generation will not necessarily work for another generation. "In a study taken by Gensler, in the article 'Strategies for the Intergenerational Workplace,' the following was verified." "The generations of people working have different opinions on what defines comfortable offices." (Kirkpatrick, Martin and Warneke 2008).

In the article, people born 1920-1942 (the **Veterans or Radio Babies**) are comfortable with Taylorism in the office. Why? One important factor would be the world wars. When drafted, this age group was used to the hierarchy system of command. The office wasn't so different. Taylorism was a form of order that people were able to relate to. That is why people in this age group work better in private workplaces than other age groups. Employees of this age visually displayed authority and status to the lower staff and clients by signage and workspace.

The **Baby Boomers** make up 20 percent of the workforce today. People born in between 1943-1960 are considered the largest group of people of the four generation types. When this generation retires, there will be a large gap of workers missing in the office. Some reports estimate a 20 percent reduction in

office employees. When that time comes, the next generation will have the burden of replacing the gap of people working in the office setting.

Each space has one function such as separation in conference rooms to individual workstations. The office is laid out with clear distinction while reflecting the symptoms of Taylorism. The Baby Boomers are hard workers and follow closely to how Veterans view the office. There's a clear distinction in hierarchy, order and title which is associated with conventional office design.

The most change occurred with people born between 1961 and 1979, referred to as **Generation X**; they tore down old barriers and drove out the old hierarchy system of running a business. They are technology driven as they evolved in the work environment. Many offices are beginning to infuse the different generations, creating a fusion of old and new styles.

The final generation of people entering the workforce today is the **Millennial** or Generation Ys. Born between 1980 and 2000, they are similar to Generation X in working in the office. They are technology driven and work in open offices where status and hierarchy are minor.

"The younger generation thinks they know it all and has a difficult time communicating with the team. Usually they are plugged in listening to music and not absorbing a lot of information that is pertinent to a project." "In a document research by Gensler, it says 'the older generation stamps the Millennial as arrogant and technology driven people.'" (Kirkpatrick, Martin and Warneke 2008, 02). Since this generation is in the age of 'economy prosperity,' they are more highly educated and socially active. The Millennial have the 'fun factor' which is missing in the Veteran and Baby Boomer's generation.

Although this generation is just entering the workforce, the Millennial are playing a crucial role in replacing the Veterans and Boomer generations, who are easing their way into retirement. Workplace transformation will introduce new and different issues/problems. When the older generations retire, the workplace we will be forced to change and adapt a new culture of office design. We are gradually seeing developments of this change which will be covered further in the chapter.

Male Dominance in the Workplace

In the past, tradition dictated that men went to work and women stayed at home. Over the years, this American model changed as women entered the workplace. In the past two decades, women have made an impact, and have placed relationships and families on hold, to devote time to careers. This initial response to career-oriented women is popular among independent women today, especially in their 20's and 30's.

Women find it challenging to juggle career and the family. Women in the workplace have encountered issues competing with men. Due to these issues, the number of children born is gradually declining in America and Europe. The number of women today older than 30 who have married or started families is on the rise. Although women are equally accepted in the workforce, 20-30 years ago, women in the workplace were not accepted as they are now. Today, it is common to have female co-workers or female superiors.

[Wages for women should be equal to that of men. No law existed on this issue until January 2009, when President Barack Obama signed his first bill called, 'the Lilly Ledbetter Fair Pay Act.' This bill stipulates that women of equal status to their male counterparts must receive equal pay.]

Ethnicity

We are a global society. In the past decade, we've seen an increase in minority ethnicity in the workplace. The office has incorporated new managerial roles and office policies to improve work conditions for all employees.

"A diverse ethnic mix also brings about variety in abilities, experiences, and cultures that may be productive and may lead to innovation and creativity." (Alestina and Ferrara 2005, 762). Research has proven that ethnically mixed workplaces have led to new ways of thinking, while adopting other office cultures.

Ethnic diversity in the workplace has become integrated in our lives. We have become a global society that recognizes talent, creativity and hard work instead of discrimination of race, gender, or ethnicity. These ethnically diverse workplaces are commonly found in high-density cities. Within these highly dense, highly populated cities, people seem to be more tolerant of racial and cultural differences.

Today, the office has a variety of diverse people and ethnicity working in different office environments. The office represents a diverse number of people working in an environment that may not be to their comfort. The office has become global place of work. Office furniture should have a certain level of ergonomics to accommodate people of various size and weight, so employees can work comfortably on tasks.

Economic Depression and Expansion

Today, Americans and most of the world are unstable economically. America is currently experiencing a recession whose only equal is perhaps the Great Depression of 1929. This 10-year great depression created massive job losses in America. Today, this

recession has created immense job losses of office employees. Although this is a 'dog-eat-dog world,' this crisis has placed a collar on our workforce bickering, and has created a situation where people fear loss of jobs.

In Hawaii, according to the U.S. Bureau of Labor (August 2009) preliminary unemployment rates increased 7.2 percent compared to August 2008 statistics of 4.2 percent. Hawaii's unemployment rate rose three percent in the past year. Translating these figures meant, "There were 643,400 people in the work force and 46,050 people without jobs in August." (American City Business Journals, Inc. 2009). Compared to the rest of the nation, Hawaii's figures were relatively low, while the national average increased 9.7 percent in August 2009. California's rate increased 12.2 percent in August 2009. This decline in employment, in addition to elderly retiring, indicates the economic workforce will be pushed harder for survival. The number of Baby Boomers retiring in the next five to 10 years will reduce the office size in America by 20 percent. This percentage is more than two million people. How will the workplace survive? Although the number of Millennial entering the workplace is close to the number of Baby Boomers already in the workplace, they are young and inexperienced. This would lead to a socio-economical shift in the workplace.

Expansion was occurring in many companies, just before the beginning of the 2008 recession. As companies were thinking of expansion, some tried to develop new ways to create larger offices without moving locations. Many workspaces became smaller. One theory is that the growth of employees entering the workforce meant that employees had to learn more types of tasks in order to compete with others. The mobile employee became feasible in many companies. Mobile employees were trained in order to travel to various locations, and were influential in providing important information to other branches or companies. When expansion occurred mobile employees responded as individual skilled workers. Expansion attracted people with individual talent. Meanwhile, in order to counter the recession, employees sought to multi-task projects/assignments to remain employed.

Outsourcing

Globalization took a toll in the 1990's when outsourcing became a phenomenon. Outsourcing produced inexpensive labor and materials for many international companies. Later, communications through technology improved, and maintained contacts among business consultants, clients and associates. This breakthrough in technology made communication in global companies easier. Now we can do business anywhere in the world, since resources and technology are readily available.

"During the early and mid 1990s, outsourcing has become an easy prospect in assisting small businesses for computer and technology specialists and mass producing objects. When the downsizing of the 1990s occurred, a survey came out from Dun & Bradstreet (D&B); it says there are 146,000 outsourcing

companies that are listed doing business with more than 1.6 million firms in the D&B information database. Roughly 70 percent of American companies outsource to third world countries.” (Dun & Bradstreet 2002).

During the past decade, countries such as India and China have become an inexpensive source of outsourcing. They can produce massive quantities of inexpensive items. Many foreign companies branch to these countries for inexpensive labor.

The trend went south when two years ago, a large American clothing company; the Gap, Inc provided false claims about improving conditions for outsourced employees. Others who were exposed paid a heavy fine, and were ordered to improve facilities. Telecommunication companies have expanded into the outsourcing business. Of the 76 percent of American companies outsourcing to Third World countries, a large number are in the telemarketing sector.

Since this issue escalated, American people who want work, want jobs to stay in America. President Barack Obama has promised to limit American businesses from outsourcing work. America has reduced the volume of outsourcing abroad, yearly. In the Gensler survey, companies that include employee ‘learning’ to increase employees’ knowledge, are considered better than companies that consider outsourcing as a solution to reducing company costs. As a result, companies that include employee learning have improved profits yearly by two to three percent.

What is important about outsourcing to the Multi-Functional office is the globalized network companies created in working or collaborating with foreign companies. The mobile employee originated from this trend of company outsourcing. Company employees would travel to other companies and countries to teach and present information regarding work involved.

Flexibility and Mobility

“Offices were once contained by time, place and space. People commuted to and from city-centre high rises at set hours. But, in the technology-driven economy of the 21st century, offices are no longer dependent on location. Much work now takes place outside the traditional corporate building– and at every hour of the day and night. Portable communications devices and the internet have allowed work patterns to become more fluid. New environments are needed to make the workers of this new economy more productive. The nomadic office is geographically distributed across the spectrum of people’s lives– from home and high street to airport lounge and serviced club.” “It offers real choices in terms of the balance between work and the rest of life.” (Myerson and Ross 2003, 199).

Myerson and Ross's observation summarizes the traditional office evolving in work habits to meet the needs of the new work culture. The 21st century office is defined through the mobile employee while incorporating flexible workspaces and innovative technology. Technology has become an essential and intelligent way to communicate with others. A new type of employee was developed to benefit from the use of portable communication and smarter technology.

The mobile employee also created trends. In the work environment as well as mobile transportation, the mobile employee is able to travel to and from work, while working in different places at any time. "One of the emerging trends is 'hoteling' – creating work environments that can support mobile employees." (Babcock 2004). In the work environment, hoteling represents a temporary place of workspace for traveling clients, consultants and coworkers. These temporary and shared spaces become a tool for companies to communicate and work with each other. Space is required to handle various types of work for the time they spend in the office.

Another essential tool of mobile employees is collaboration. As group work has become essential in the workplace today, the mobile employee travels to other companies to assist in tasks that concern company-to-company relations. This form of work means traveling and working in other environments unfamiliar one's workspace interacting with people one doesn't know.

In an article, the mobile employee has set new trends that are gradually being adopted in workplaces today. The quote below shows the growing number of mobile employees used in the workplace in 2004:

"Responding senior executives worldwide indicate the percentage of companies where almost no one works from home on a regular basis is expected to drop from 46 percent today to just 20 percent two years from now. In Europe, by 2005, the number of mobile workers is expected to triple to 20.1 million, and the number of telecommuters is expected to more than double to 8.7 million." (Babcock 2004).

In another article by Steelcase's 360 Deep Dive, How Emerging Work Strategies are Changing the Workplace:

"2011 nearly 75 percent of the U.S. workforce is mobile; In Japan, it's nearly 80 percent. The center of knowledge production, the office, is now everywhere." (Steelcase 2009).

We're finding significant adjustments to the office layout. The office in the 21st century should include temporary and flexible spaces for the mobile employee.

Flexibility can be defined through this segment, found in the book, “The 21st Century Office: Architecture and Design for the Millennium.” In this section, the idea of flexibility is reflected through office layout and office furniture.

A major evolution in the office besides mobility is flexibility. Flexibility in the workplace has become the focal point in the 21st century office. There are two characteristics of the flexible office; the first is through flexible office furniture. Office furniture, designed by such companies like Allsteel, Steelcase, Knoll, Haworth, and Herman Miller have created furniture that can rearrange or adjust to different work task based on research and development. The second is through employees' work habits. The evolution of the office set new boundaries for the mobile employee who is able to work at different times of the day, and in different places. The furniture is flexible to employees' time, role, tasks and needs. Flexibility in the workplace was discovered as fixed task workstations became obsolete for the mobile employee. The office is still the hub for the mobile employee to return to. “In addition, shared ownership of “private” office spaces also is becoming common as a mobile workforce sees more employees on the road more often, says Diane Taitt, a partner at Bethesda, Md.–based GTM Architects. Each employee will have a private pedestal – meaning a secure place to stow personal belongings – but the basic office space (chair, worktop and so forth) will likely be shared at businesses seeking to minimize their real-estate spending.” (McGarvey 2008).

At the time, outsourcing was the foundation for the emerging ‘mobile employee’. Today, the mobile employee simply represents the person who spends at least 20 percent of the work week away from the office. Of the various industries working in the office, the mobile employee has become well known in the workplace.

The mobile employee led to an increase in multi-task workspaces. Fixed workstations were sublimely used for multi-purpose activities. Basically, the workplace should incorporate the use of multi-function furniture to improve the way we use current furniture. Currently, we work in the workplace where furniture is misused. We want to correct this misuse of furniture to encourage different task work for specific furniture in the office. The new office defines flexibility as “moveable, adaptable, and scalable.” (Dragonfly 2006).

Socially Implied Space

In recent years, social spaces have increased in the workplace. Such businesses as Google and Pixar have moved forward in designing spaces for social interaction, and recreation activities. These stress relieving spaces evoke an increase in employee productivity and efficiency. Such social spaces give the employee a chance to relax and recreate while in close office settings.

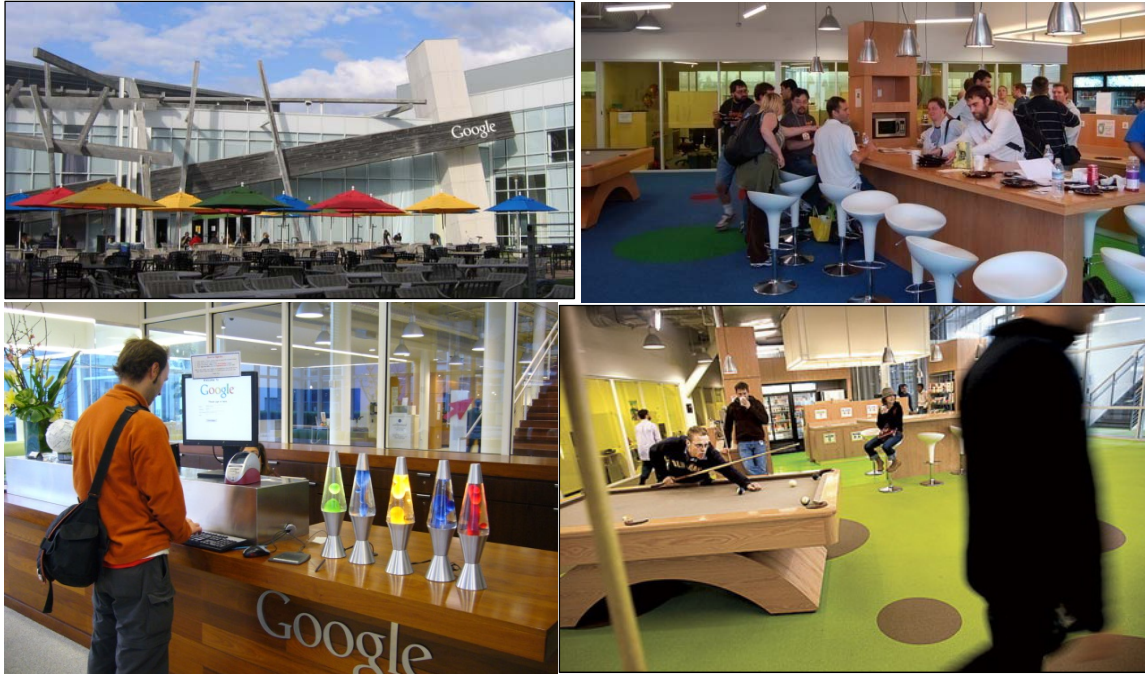


Figure 12 Various Social Spaces in the GooglePlex (Yahoo! Inc. 2010)

The GooglePlex or Google Headquarters in Santa Clara County became a dominant attraction for its design creativity and its various implied social spaces. This campus-like design created the ideal employee workplace environment. In this environment, the social spaces vary from anything one can imagine. In response to social spaces, statistics have shown; better job satisfaction, creativity on task work, and greater collaboration of teamwork. In the next chapter, the percentage of increase social spaces has proven that employees are satisfied in the workplace. Google Headquarters receives more than 200 applicants every six months.

Green and Sustainability

People are beginning to realize the impact of global warming on the environment. As a stop-gap solution, people are trying to improve the way they live and work, by using green and sustainable systems and practices in daily life.

American offices are including sustainable and green materials and equipment in the workplace for two purposes. The first is to create a better work environment to reduce company cost on the office and to improve the 'human factor' while working to enhance worker productivity and happiness. As these points are valid, another reason is important too. The trend of incorporating LEED (Leadership in Energy and Environment Design) into the office means marketing rights to show current and future clients that the company is doing its part in preserving the environment. This marketing strategy improves relationship between client(s) and employer. Although we incorporate LEED into American offices, countries such as Japan haven't adopted the initiative. Whereas, other

countries such as the UK created BREEAM (Building Research Establishment Environmental Assessment Method), while Hong Kong inspired by UK's BREEAM created BEAM (Building Environmental Assessment Method). These requirements certify the building or materials used in project to benefit and improve companies' employees. As this issue becomes realized in the workplace, this section is considered an important topic.

The prime factor green and sustainability offers, depending on the LEED rating for American offices could save the company roughly 10% to 80% of energy savings per dollar spent annually. These factors are beneficial to the company and with the right amount of solutions implemented, could improve employee satisfaction at his/her job.

A growing number of businesses are including green and/or sustainable steps in the workplace. In some cases, the building becomes the habitat for green vegetation as well as sustainable design. These implied green spaces of vegetation can be applied as social gathering areas too. They become a treat when relaxation and recreation is needed, in addition to improvement of company environmental ratings. These types of social sustainable/green office environments can be considered in the same trend as community implied space where offices include green areas as community lounges.

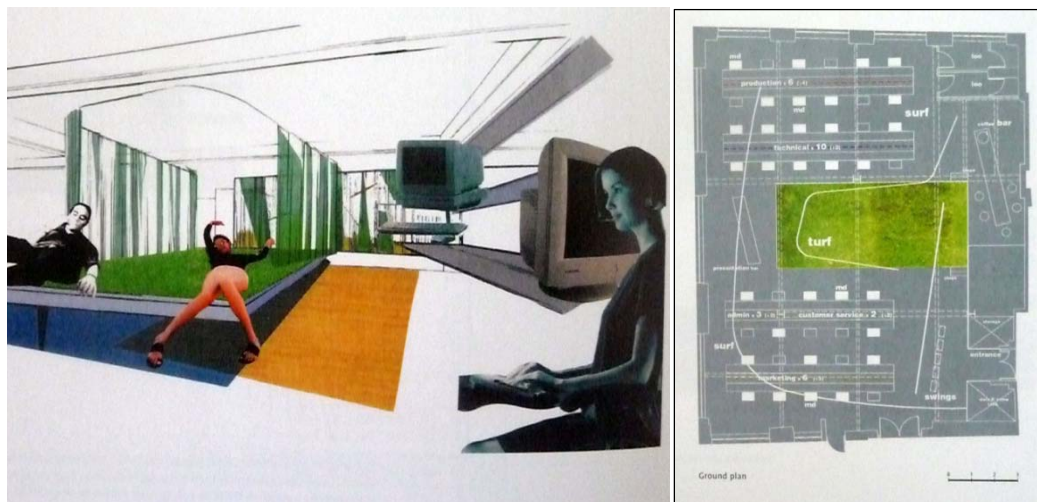


Figure 13 (Left) Another.Com's Surf'n'Turf Concept and (Right) Floor Plan (Myerson and Ross 2003, 138-141)

Another.com an English-based IT company alongside Nowicha Stern Architects created the concept Surf'n'Turf for their 251 square meter office. The term Surf'n'Turf "accurately describes the range of the work environment of an IT start-up; surfing the Internet has been transformed from a leisure activity into office work, and the turf brings leisure into the office." (Hascher, Jeska and Klauck 2002, 164). Architect Nowicha Stern design a simple plan of incorporating a patch of green as counterpart the virtual environment Another.com uses. They also discourage hierarchical management with the young staff, while creating an open mind set of work flexibility.

Social spaces can be multi-functional when applied to the office appropriately. There are some social spaces that create various forms of interaction by re-arrangement of furniture. These forms of social implied spaces could be informal meeting areas to private think spaces. Furniture plays an important role in this grouped arrangement of multi-task work. To some extent similar tasks work can be applied to these spaces, but drastic arrangement of social space for other activities may not prudent.



Figure 14 Living Tower by Verner Panton (Panton 2010) (Panton 2008)

This particular furniture created by Verner Panton called the Living Tower is one of the most spectacular pieces of design ever built. One could create a row of this furniture type to observe how people interact with them. Furniture such as this creates unusual but delightful ways of developing social interacting. The Vitra Company in Weil am Rhein, Germany, used a combination of this furniture piece to “provide an unusual breakout space for staff.” (Myerson and Ross 2003, 39). As such, the Living Tower could be used as individual furniture or in combination with each other to form creative social spaces for informal work or informal interaction. It could also be used for clients and consultants as a comfort waiting or lounge area. In addition, the furniture splits into two pieces and is light enough to be moved and rearranged.

Conclusion

Society has changed at a rapid rate. “In a YouTube video called, “Did you Know 2.0,” it states in today’s statistics; “a 21-year-old has talked an average of 10,000 hours by phone and sent/received 250,000 emails/text messages. In only four years, roughly 50 million people will be able to use a computer.” Technology has taken the world by storm, and was able to market to an audience of 50 million

people faster than television (in 13 years) or the radio (in 38 years).” (Fisch and McLeod 2007). As we progress, the next generation of people entering the workforce will experience and learn faster than the previous generation. Thus, society tells us that change is inevitable; our lives are reflected in technology – we either adapt, or become obsolete.

Through identification of problems and changes in workplace trends, we understand what issues are affecting offices today. These factors change the workplace; architects and designers must realize past and new issues to create the best design layout for the office. These issues come from economic and social developments outside the business. Equal rights and technology change the way we experience and use the office. Past and new developments become the basis or foundation for a new office design and managerial style.

This was not the case years ago; managerial roles had less impact on the office than design. The popularity of Taylorism gradually withered as it approached the 21st century. New elements arose such as multi-cultured offices, four generations of people, and women in the work force. These trends created a conflict in U.S. offices, impacting office designs became essential to satisfying employees. Even through social change, such as outsourcing and mobility, the office layout has evolved. These office types and work areas have created numerous office layouts.

Change has made an impact in the office in many different ways. Since change is occurring at a higher rate of speed, than say 50 years ago, the office is evolving into a new environment where flexibility and mobility are essential. In a study, a group of researchers documented an increase of mobile employees in the workplace. These mobile employees are considered an important commodity in the workplace, and will have to travel considerable distances and still be able to work efficiently. Such books as ‘21st Century Office’ and ‘Radical Office’ by Jeremy Myerson and Philip Ross have included another popular trend called ‘social spaces’.

Key elements from this section of the research have had an impact on the office in the past, the present and will have in the future. By understanding how office trends and culture impacted the office, we can see how and why employees are not satisfied in the workplace. The next step would be to see and review how current changes in the office, described in this section, produced better results among office employees. In the next section, these influences have led to discovering improvements in office design and space planning that employees are satisfied with. Through statistics and research, companies that stay current have experienced employee job satisfaction, efficiency and productivity, thus creating better work environments.

Chapter 2

Procedural Attempt to Solve the Current Problems

Defining the Office through Workspace and Statistics

In this chapter, the workplace has been categorized into four types of workspaces. These spaces summarize how offices are used; this is based on criteria of a company to work and function for employees. Through research, evaluation, and questionnaires, we found that employees in a variety of companies and businesses weren't comfortable or satisfied in the workplace. This chapter will explain how research companies identified improvements to better define a good workplace environment; this was evaluated by analyzing data collected from several sources addressing, "Why employees do well in better design workplaces?"

Conventional versus 'The New Office'

The 21st century is defined by its rapid and constant change; as such, the traditional office has become obsolete and unconventional – the office must evolve to meet the characteristics of its respective time. In Duffy's "The New Office" he created a list of expectations, routines and mindless task that are commonly seen in workplaces. Below is the list of conventional offices in comparison to 'The New Office' solutions, please keep in mind, the book was published in 1997. Today, we have different expectations, problems, and solutions that have similar affects to 'The New Office' solutions.

The Conventional Office (Duffy, The New Office 1997, 56-58):

- assume that clerical tasks are the staple of office work;
- offer limited settings because the work is homogenous and undifferentiated;
- accommodate one person per workstation, and then only from nine to five;
- are excellent at expressing boundaries through physical barriers designed to keep functions and people apart;
- are even better at reinforcing hierarchy through an apparatus of physical signs that indicate precisely how important – or unimportant – everyone is;
- suit big groups – departments, businesses – rather than small;
- say nothing about teamwork because little individual, let alone collective, initiative is necessary and very few resources are shared;

- is at a distance from the logic or potential of advanced forms of information technology.

The physical features and appearance of 'The New Office' will depend upon, and be stimulated by powerful, integrated, interconnected, and ubiquitous information technology. 'The New Office' expresses (Duffy, *The New Office* 1997, 56-58):

- much greater attention to the economic importance of better use of time, taking advantage, for example, of office work as a parallel and serial, rather than a linear, process, leading to moves towards intensifying the use of spaces;
- impatience with boundaries, because advanced organizations want more communication between departments and between specialism in order to solve more complex problems more quickly;
- little love of hierarchies, and even less of status because, more often than not, what you can do is more important than who you are;
- a tendency towards smaller, more rapidly changing organizational units, the result of stripping organizations back to the core by 'out sourcing' whatever activities are non-central and ruthlessly weeding out anything that is redundant;
- the importance of group activity, reflected in the provision of work; settings that are the focus for, and encourage, interactive, complex, open-ended teamwork – these are expected to be mostly open—plan and only partially cellular but with much more specialized support, often in the form of several different kinds of meeting and project areas
- the obsolescence of clerks and clerical ways because routine clerical tasks have been automated or exported off-site, away from the creative teams and decision-makers;
- total confidence in the creative use of information technology;
- a new flexibility, with an ever-wider range of work settings in response to choices in the timing of work and in the ways in which it is carried out.

As we know, the workplace today could use some revisions. Generally speaking, the office culture today is in some way *still* similar to the predicted 'New Office' analysis, Francis Duffy has discovered. The transition of highly integrated work spaces and teamwork has become more popular in workplaces, in addition to high use of technology and creativity.

This conclusion could be attributed to generations of people working in the office and the diverse individuals working together. These effects or changes are defined and

identified through past research conducted by several different companies, and they concluded similar results.

The concept of the Multi-Functional Office could be applied to this early prediction of 'The New Office' design. In comparison, the predicted observations display a better balance office than the conventional analysis taken. It seems that the office has undergone change that alters the employee's role mainly through economic and social change. The comparison of the old versus the new office was the basis for Francis Duffy's 'Four Work Modes' which will be explained below.

Workplace Survey (WPS) and 'The Four Work Modes'

A survey (Workplace Survey) was taken "in 1997" by "DEGW (Duffy, Eley, Giffone, and Worthington, plc), in collaboration with the Building Research Establishment (BRE), conducted a study on the implications of modern working practices for the specification and performance of building form and environment systems – New Environments for Working (NEW)." (Harrison, Wheeler and Whitehead 2004, 17). This would be the model of logical design in new offices, encompassing four alternate office layouts in accordance to type of activity each supports.

[On a side note, DEGW PLC originated from JFN Associates by Francis Duffy, in 1971. Duffy formed DEGW in partnership with architects Peter Eley, Luigi Giffone, and John Worthington. This independent, "London-based architectural and consulting firm, focused on the planning and design of workplace environments." (DEGW plc 2009). That's why they are one of the original researchers to study workplace efficiency and productivity throughout the decades.]

The logic behind the study has been beneficial. They were able to categorize the office into the four modes of work. They are Individual Processes (or HIVE), Group Processes (or DEN), Concentrated Study (or CELL) and finally, the Transactional Knowledge (or CLUB).

The '**Individual Processes or Hive**' mode can be characterized as individuals working in an area. They mainly consisted of junior to mid-level staff that are simply put into a desk and worked every day in the conventional nine to five job. They are the work force behind the company and considered to be majority of the company's employees. They use approximately 50-75 percent of the floor plan.

The '**Concentrated Study or Cell**' mode refers to the private individual. They consist of people who are talented independent persons in the company and have been given a private or 'isolated' office space. They are leaders in their department, branch, or division, and considered to be the decision makers of daily operations.

The '**Group Processes or Den**' mode are meeting or group work spaces. They are highly interactive areas with minimal to no individual freedom. One can consider these spaces

as team or conference rooms that range from private rooms to informal group tables arranged in the open office. Assuming that individuals have their own desk; these areas can include access to auxiliary spaces and/or share equipment; i.e. printing/copier, storage, and other facilities. These spaces are intended for intense short-term use. They are rarely used for long-term functions, but are typical for group or team gatherings. Items required in den spaces could range from use of televisions, telephones, projectors; devices that support the group of individuals while in session.

The **'Transactional Knowledge or Club'** mode is considered highly autonomous and highly interactive spaces. This space has a "variety of time-shared task-based scenery" serving for "concentrated individual" and/or "group interactive work." (Duffy, *The New Office* 1997, 65). Individuals and teams request space on an 'as-needed' basis and could take advantage of a wide range of facilities. Depending on work activity and content, this space could be in-house or out of the office facilities.

In 1997, this mode referred to social spaces such as the Gentlemen's Club, as that refers to something completely different today, we can assume this space was intended for a means of interaction on an intimate social level. These spaces, in the office could refer to the lobby, break/lunch rooms, casual resting/relaxing areas, and out of the office (i.e. restaurants, lounges, clubs, and bars.)

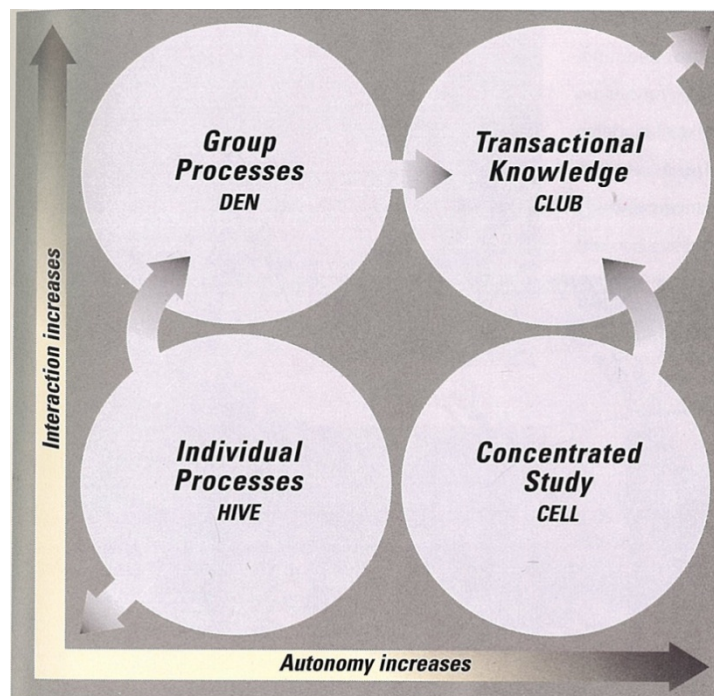


Figure 15 the Four Work Modes Chart (Duffy 1997, 61)

These four entities in the office clearly are distinct. When combining these distinct work modes, we can determine how workspaces are used and for what purpose they are used for. What occurs is the transition of work modes in the office environment.

The chart, analyzed in 'The New Office' 1997, indicates the location of each work mode, increases and/or decreases, work interaction, and autonomy, best describing how the four modes divide the workplace. These work modes shown to a client's company can show which modes have greater importance to the others (perhaps change to: These work modes have different levels of importance, depending on the needs of the company and respective industry).

For example, a law firm will increase its 'cell' mode because each individual executes responsibilities in private, which cannot be distributed or circulated by any means necessary. This office industry type consists of high autonomy areas with minimal employee interaction. In comparison to an advertising agency where communication is crucial, a large 'den' and 'club' mode would be appropriate. This type of workplace is highly interactive and employees would have various autonomy spaces. Using this chart can determine how different office industries utilize different modes and for what purpose.

The Workplace Survey or WPS, for short, was able to determine these work modes and how they were applied to different office settings. Each company was surveyed under the WPS and made critical comments on what they considered important. This survey gave architects and designers the opportunity to apply knowledge learned to improve workspaces for their own, future clients, and employees' needs. WPS was distributed only to clients, rather than architecture, interior, and office design firms. As a result, the survey wasn't successful in acknowledging the audience it was intended for. Ironically, predictions made by Francis Duffy in 1997 are realized today, where current interior projects are seeking customers and employees to make suggestions to improve the workplace. Awareness today is only beginning to be acknowledged, although the major trend is sustainability or green design.

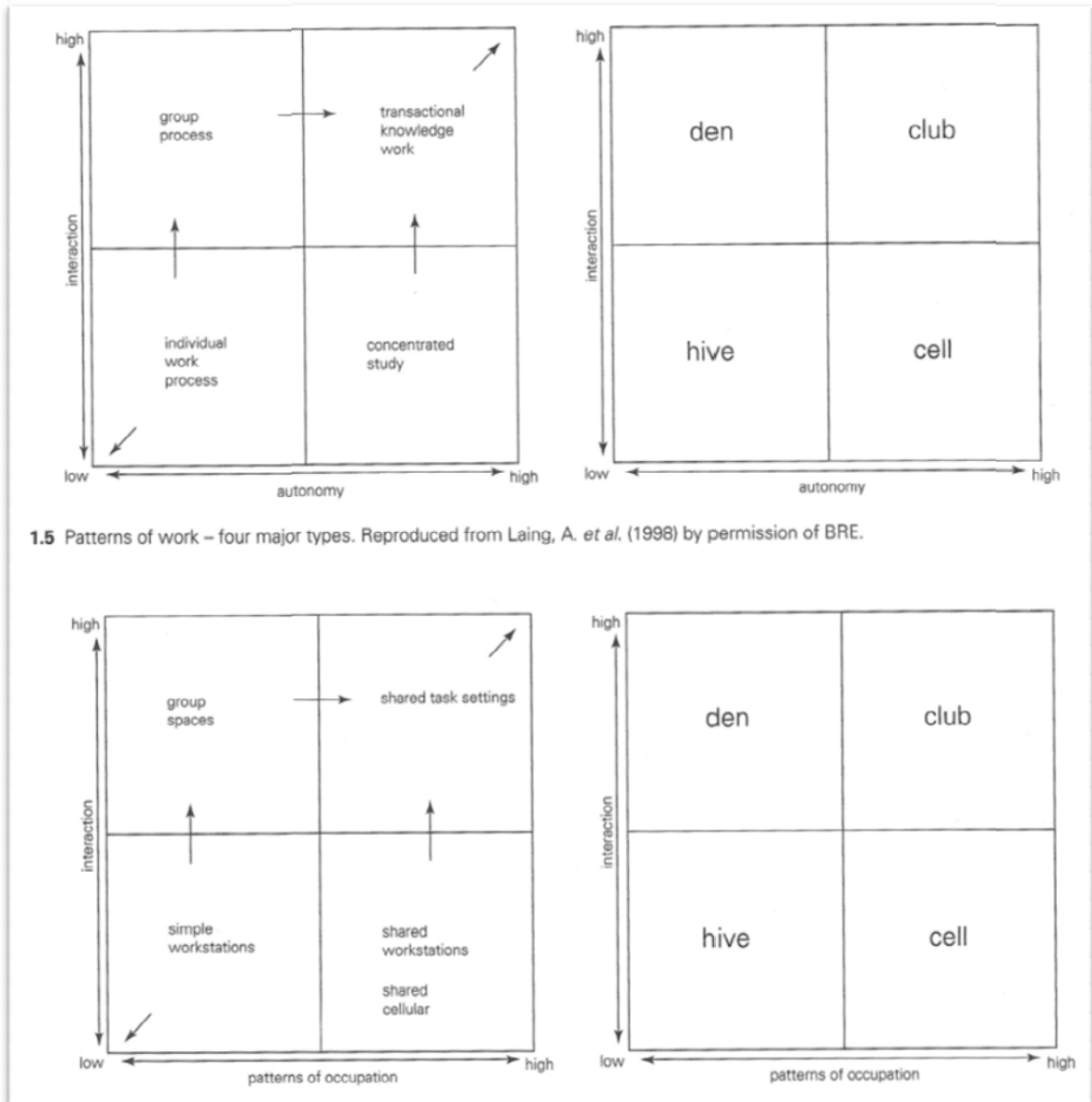


Figure 16 (Above) Patterns of Work and (Below) Space Occupancy (Harrison, Wheeler and Whitehead 2004, 18)

Analyzing the chart, Patterns of Work and Patterns of Space Occupancy nothing has changed. It was created to display the breakdown of Francis Duffy's Four Work Modes chart. This attempt simplified Duffy's original chart conveying two starting points for you, the architect, or designer to bubble diagram offices. When you correct the number of occupants to patterns of work, you will realize the differences in work mode sizes. Take any company; the pattern of work would be completely or slightly different to the modes in the pattern of space occupancy. What clients want, and what they need, are never the same.

DEGW, PLC researched in 1997, the WPS consisted of questions surveying more than 1,000 companies. WPS found that more than 60 percent of office employees weren't comfortable in their office environment. The chart below explains how the four patterns of office spaces were gauged in the workplace.

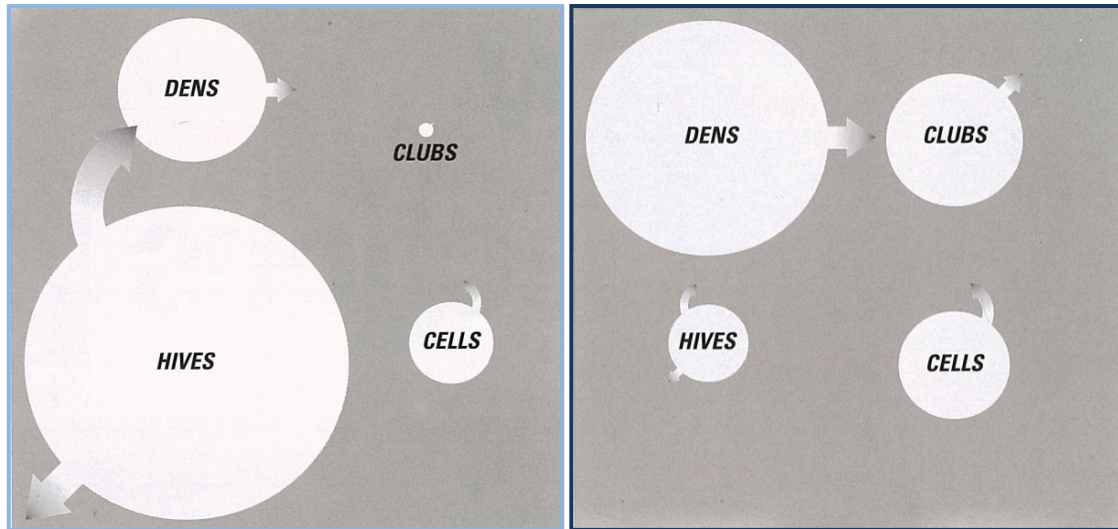


Figure 17 Predictions of Office Trend in (Left) 1990 and (Right) 2000 (Duffy 1997, 67)

Tying the conventional and 'The New Office' analysis, DEGW was produced this image displaying the difference in offices in the 1990s to the predicted office at the beginning of the 21st century. The left chart illustrates the pattern of working, while the right image displays the predictions of the office in 2000. The 'hive' has declined dramatically based on current office trends. In place, the 'den' area absorbs the gap creating a larger group sharing area. The 'cell' remains similar in size, but the 'club' mode is predicted to become larger, almost five times the size.

The predictions made in 1997 and for the predicted year 2000 have come fairly close to the actual approach offices expect today. One can say the size of the 'hive' work mode isn't as drastic as it is shown; in addition, 'club' work mode is still being introduced into the office scene. Currently trends of the 'club' are being approached and introduced as 'green office design' too.

In Duffy's 1997 book, *The New Office*, he writes: "It is expected, as information technology changes, that many examples of the offices now identified as being for 'group processes' [dens] "continues to say, "will tend to converge into what has been called the 'transactional' office [club] where, through deft management of time and space, both interaction and autonomy will be maximized." As stated, in the future, more *focus will be on mobility and flexibility*; the office will start to merge spaces that were defined as separate modes. (Duffy 1997).

Workplace Envisioning (WE)

As part of the workplace vision, DEGW supported Steelcase in researching a computer-aided means of finding design solutions in order to increase the success of office design.

This process was to create workshops for three types of office employees based on operational staff to management. In doing these workshops, the Workplace Envisioning or W.E. sessions eased and accelerated the process of finding or developing the best concept and office design. It was analyzed that employees of every position sorted their priorities and provided insight about particular support areas and habits created in current offices.

W.E. was created for architects and designers to understand the project before creating an office schematic design. In the Work Performance Survey, these sessions improved the general outcome that was documented in post-constructed office projects.

Time Utilization Studies (TUS)

Time Utilization Studies or TUS was developed by DEGW in finding percentage of task work to time of day completed. These charts below display how general use of open-plan offices are working, compared to occupancy of enclosed offices.

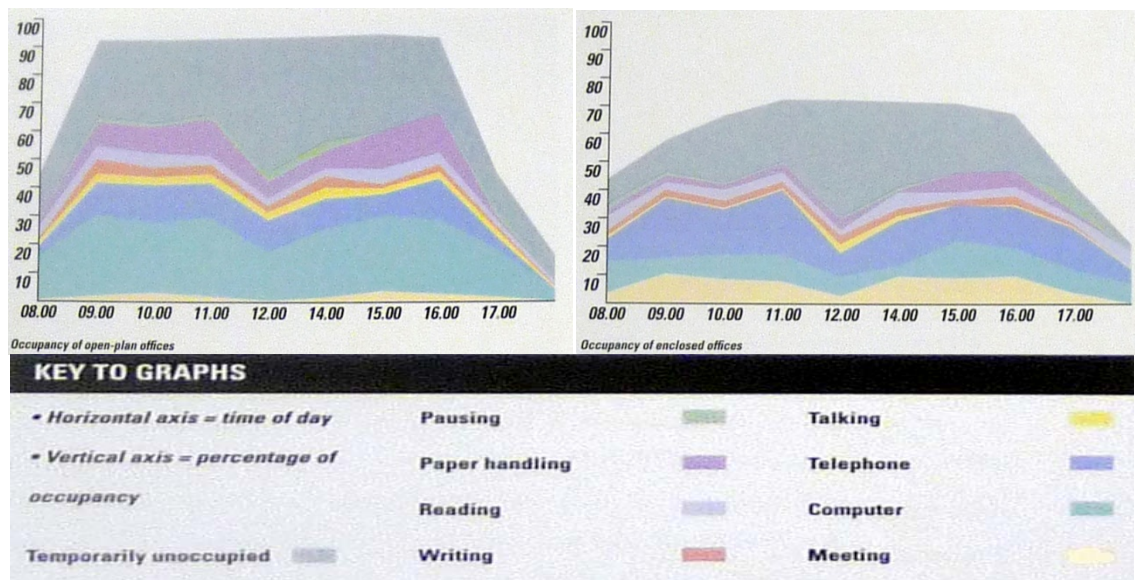


Figure 18 Time Utilization Study for (Left) Open Plan Offices and (Right) Enclosed Offices and (Below) Key to Graphs (Duffy 1997, 227)

When looking at the charts above, it seems that employees working in enclosed offices work less efficiently than employees in open-plan spaces, due to more privacy and less collaboration among co-workers. The difference in task percentage states that Open-

Plan offices are productive and efficient than enclosed offices. The key chart below the two graphs label the different tasks by color.

In this study the colorized task work, the median amount of work done in a work day is meetings and paper handling, which is as minimal as 10 percent of the day. The only types of task work that consume more than 10 percent of the work day are spent on the computers, telephones, and/or are temporarily unoccupied. This shows the percentage of people prior to WPS has worked less productivity by these graphs.

This study taken in 1997 as part of the WPS was circulated to different companies and offices in pre- and post- construction as stated in "The New Offices," written by Francis Duffy.

The Multi-Functional Office is base on points of time utilization. At the same time, the office has multi-functional furniture to create better space planning for various task works. What happens next is that, organizations of time, which will be elaborated on in Chapter 4, discusses how reservation of different appointments help control the different work environments created for various task and other work involved.

Workplace Index (WPI) and 'The Four Work Modes'

Workplace Performance Index (WPI) is a survey created by Gensler in 2002. This informative survey created from questioning and evaluating over 3,000 companies from 12 different industries specific to America. (In the UK, Gensler form a separate WPI survey on companies there.)

The fundamental ideal Gensler's WPI proves:

"To understand [day-to-day] knowledge workplace activities that produce business success" (Gensler 2008, 03).

WPI defines the value of work effectively allowing top companies to maximize their response to projects. WPI is a 'mindset!' Before companies could not measure the performance of their employees' space of work. WPI is a pre- and post- survey to seek data on top and average companies that have successfully completed their office or are planning to, when clients see these numbers, their 'mindset' changes.

WPI becomes the foundation or basis of understanding. WPI assist clients to understand effective workspaces comprised of design solutions in the workplace. This database informs architects and clients on comparative data critical and effectively, while producing spaces based on multiple design solutions.

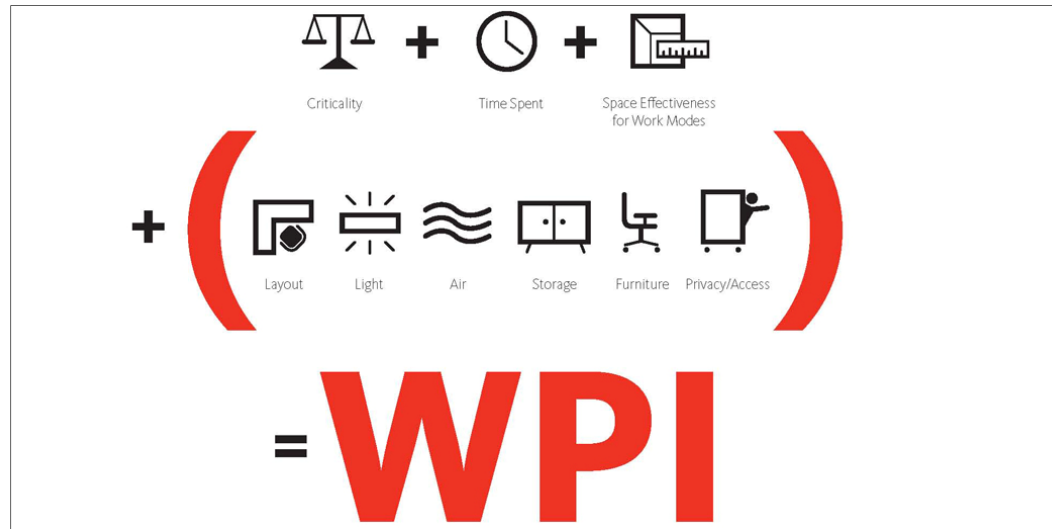


Figure 19 WPI Formula representing the Ideal Office (Gensler 2008)

The foundation of this equation is based on office ergonomics that need to make a successful or comfortable workspace. The formula consists of basic support functions with human desires. **WPI equals capacity plus time spent plus space effectiveness for work modes plus (layout, light, air, storage, furniture and privacy divide by access).** These components are the basis for good a work environment. Number two would be design. Once fundamentals are addressed, design should only enhance one's initial response to work habits.

From there, Gensler re-defined the workplace basing the model on the WPS. Thus, "knowledge work equals four work modes." (Gensler 2008). Based on these crucial factors, top companies have seen more improvement in work efficiency. These crucial factors called the 'four work modes' are divided into focus, collaboration, learning, and socialization. Created by Gensler in 2002, these 'four work modes' work together to establish better employee performance. By defining each mode, the work environment is able to collaboratively improve how work is handled, quality over quantity.

[The statistics researched by Gensler's WPI survey compares top and average companies to understand how design and layout effects employee satisfaction in the workplace. Top and average companies are represented during the course of their office renovation or new project design. For example, company A is moving to another location. The architect or design evaluates and surveys the current office; staff and management fill out surveys and discuss improvements on current workplace design with the Work Envisioning Sessions. Post project completion, company A moves to new location and settles in. Six months later, the WPI's Post Evaluation Survey evaluates and researches post office design and layout of company A's workplace. If pre-WPI improves the workplace, post-WPI will state the success of the project by job satisfaction, efficiency and productivity. This survey has evaluated and researched by more than 3,000 American companies, design by Gensler or another architectural firm.]

The first work mode is **Focus**. The focus mode involves critical concentration of protection to work on tasks and assignments. With that in mind, “interruptions and distractions are among the biggest threats to worker concentration.” “Also, in a statement from Gensler and conducted at Harvard and MIT, groups of people had the ‘inability to concentrate due to excessive information-poses another barrier to productivity’.” (Gensler 2008, 06). People focus on individual task work 48 percent of the workday. If noise and visual distractions can be minimized, productivity will improve.

WPI survey says top companies spend 21 percent less work hours as compared to average companies that work longer and more insufficiently. This improvement over concentration of individual task work improved effectiveness and efficiency over assignments and projects.

Collaboration mode means group or teamwork is used to achieve a goal. “Teams have the potential to offer greater breadth and creativity than any one individual can offer, resulting in innovative and comprehensive solutions and ideas.” (Burk, Salas and Sims 2005, 555-599). Collaboration is a mode that implied interaction between co-workers to improve or achieve the goal effectively and quicker.

“Each generation has come up with office furniture is mimic by the needs of the times. From the first L-shape desk design to fit the typewriter to Herman Miller’s Action Office in the 60s which opened up work space to ergonomic chairs of the 90s to today’s need for high tech team work.” (BLOOMBERG L.P. 2009).

What makes Collaboration important has been researched at MIT, which found that people rely on other individuals for help, learn five times faster than individuals who don’t seek assistance. This study researched, “70 percent of what a person learned was [gain through everyday interactions with their colleagues.” (Center for Workforce Development 1998) (Cross 2004, 11). Knowledge times group interaction, plus collective thinking, equals innovative solutions.

WPI has found an average of 32 percent of an employee's time is spent collaborating in offices across companies surveyed.

“This trend has grown from the awareness that fewer of us are genuinely solo workers. More of us work in teams and informal small groups. As a result, effective workplaces will feature places where two, four and six workers can settle in on the fly for a 20-minute discussion, without the formality of reserving space. These spaces are there, waiting to be used – and in the 21-century office, designers say, we will use them.” (McGarvey 2008). This could be a suggested beginning of the informal meeting area.

As Gensler revised DEGW's 'den' work mode into the Collaboration Mode. Knoll's (an office furniture company) research has found collaboration as a non-specific type of task work. Since collaboration was too broad, Knoll defines the mode into four types of group work that support today's office environment. They are defined as: Impromptu Open Plan Team Space, Think Space, Strategy Room and Communication Space. As collaboration has become a 'magnet' for group and team interaction. (Wymer 2008, 1). These spaces defined how industry type, office landscape, and office functions determine the amount of distinct collaboration spaces is needed. Briefly defining each type, Impromptu Open Plan Team Space is team meeting, casual spaces based on accessibility, modularity, and casual appearance. Think Space are intense areas of problem solving, informal and small meeting group areas. Strategy Rooms are confidential discussion areas with conference calling, interviewing, and staff or team meetings take place. Finally, Communication Space or Viewing are made up of large group or seminar style presentations and meeting. In all four distinct collaboration modes, flexible/movable furniture is recommended by Knoll. Knoll recommends that furniture especially in these spaces should be ergonomically friendly and adjustable to task, communication, and interaction within the meeting group.

The **Learn** mode is a key essential to improve the knowledge of your employees. WPI points out that "U.S. organizations spent \$109.25 billion annually on employee learning and development, with roughly 75% of that spent on internal learning programs," in order to gain the knowledge needed to perform new assignments. On a side note, the American Society for Training and Development (ASTD) stated, "this investment has led to a decreasing number of outsourcing. In that regard, constant demands have led to an increase of skilled workforce" (American Society for Training & Development 2006).

As "traditional education can't supply knowledge" to their company, "workplaces integrate learning with every aspect of daily activities." (Confessore 1996, 401-402). Thus, top companies make it necessary for employees to learn. They spend a total of 16% more time to employee learning. Whereas, average companies don't feel the need to educate extensively, therefore, employees are limited in ability to successfully complete their own task work.

The last work mode is **socializing**. Socializing is a means to establish and develop a social community sharing and networking of common values missing in your business. This mode means relationships can build bonds, connections, and friends. Research has found that social networking creates an advantage in new knowledge gain.

The value of socializing is more critical than the other modes. Socializing cannot be billed on your time sheet; but it's still an asset to the business. Top companies consider socializing to be 185 percent more critical than average companies, which means, they take that extra step into getting potential clients or consumers, in addition to creating customer satisfied environments within the company. Socializing plays a critical role to employee comfort and job success. Such companies as Google and Pixar see how improvement on employee satisfaction is increased by various social spaces.

When top companies design their workplaces to these four modes, statistics show a dramatic difference in performance. This is a valued opportunity for new companies to learn and understand why effective work environments mean job success.

[The furniture company Knoll created a similar study based on DEGW’s WPS and Gensler’s WPI. In partnering with Gensler’s researchers, Knoll produced three work modes: focus, team and share. *Focus* is individual work, *Team* represents group work and *Share* is defined as collaborative work spaces. These three work modes are considered vital components in successful workplaces as results from the surveyed companies were compared to their earlier surveys three years prior. There research has found similar improvements in team and share modes while the amount of individual work, focus decrease. In particular, Knoll created a fourth mode separate from the other three called ‘Activity Behavior’. “Activity Behavior is an integral part of all work modes and workspaces; it’s the cultural shorthand, a company norm that provides social connection to people and organizational success.” (O’Neill and Wymer, Design for Integrated Work 2009, 5).]

As a result:

“Respondents from all companies projected that better work spaces would yield significant improvement for their performance of each work mode: 28 percent improvement in focus, 27 percent in collaboration, 27 percent in learning, and 23 percent in socializing.” (Gensler 2008, 12).



Figure 20 taken from the 2008 US Workplace Survey (Gensler 2008, 8)

Although many companies surveyed employees and companies in search for design solutions, each company had different wants or needs. WPI is a survey to understand companies and show the differences between wants and needs. WPI used the opportunity of WPS to gain client approval and build relationships. As WPI is currently available for businesses in the U.S. and UK, many companies should use the knowledge provided to improve on companies' office performance in order to increase employees' success.

[DEGW and Gensler were not the only companies to research this subject of current and future trends and their applications to new work environments. In fact furniture companies such as Herman Miller, Allsteel, Knoll, and Steelcase are some of the companies that have researched more than dozens of surveys taken by more than 50 companies world-wide. In addition, companies such as HOK Architects have research similar work modes in the office setting.]

Post-Occupancy Surveyed

“Workspaces are also ‘crucial in employee retention,’ says Karen Daroff of Daroff Design in Philadelphia, Pa. ‘Who wants to return to an unpleasant office day after day?’ Organizations have begun to realize that employees are much more likely to stay at a job when they like where they work.” (McGarvey 2008).

When WPI survey received pre- and post- evaluations from respondents in more than 3,000 companies, in eight professions working in an office setting, they found these facts: Within each industry in the office, the percentage of work modes is different. Depending on the office industry, one profession could have a higher improvement rating in learning or focus than in socializing work mode. WPI found that respondents who were evaluated have seen overall increases in job and work satisfaction. Generally, across the board improvements to the office for these eight industries have seen better productivity and efficiency in the work setting. The eight industries that were evaluated are common to the workplace. Gensler’s WPI represents the eight office industries as Legal, Banking/ Finance/ Insurance, Technology/ Internet/ Telecom, Consumer Product/ Retail, Consulting/ Accounting/ Business, Media/ Creative/ Entertainment and Non-Profit Organization.

Respondents evaluated

Respondents surveyed found that top and average companies were satisfied in the workplace this percentage:

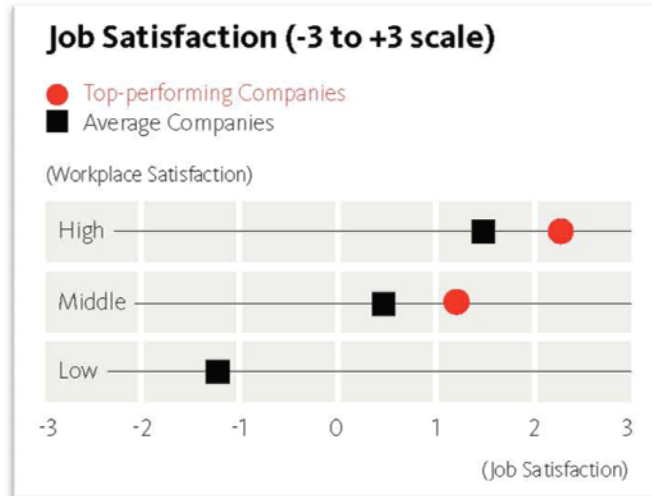


Figure 21 shows Job Satisfaction (Gensler 2008, 11)

Scaling satisfaction from -3 to +3, -3 being least satisfied in the workplace and +3 representing most satisfied. Average companies in low to middle positions are between a -2 to +1 average. Only high position members in average companies are above +1 in job satisfaction. Respondents in top companies say, job satisfaction is within a +0 to +2 average increase. However, this chart isn't adequately descriptive. Therefore, Gensler used the statistic surveyed to create this graph below, describing the percentage of people from -3 to +3, in all positions were satisfied with their workplace.

WORKPLACE SATISFACTION

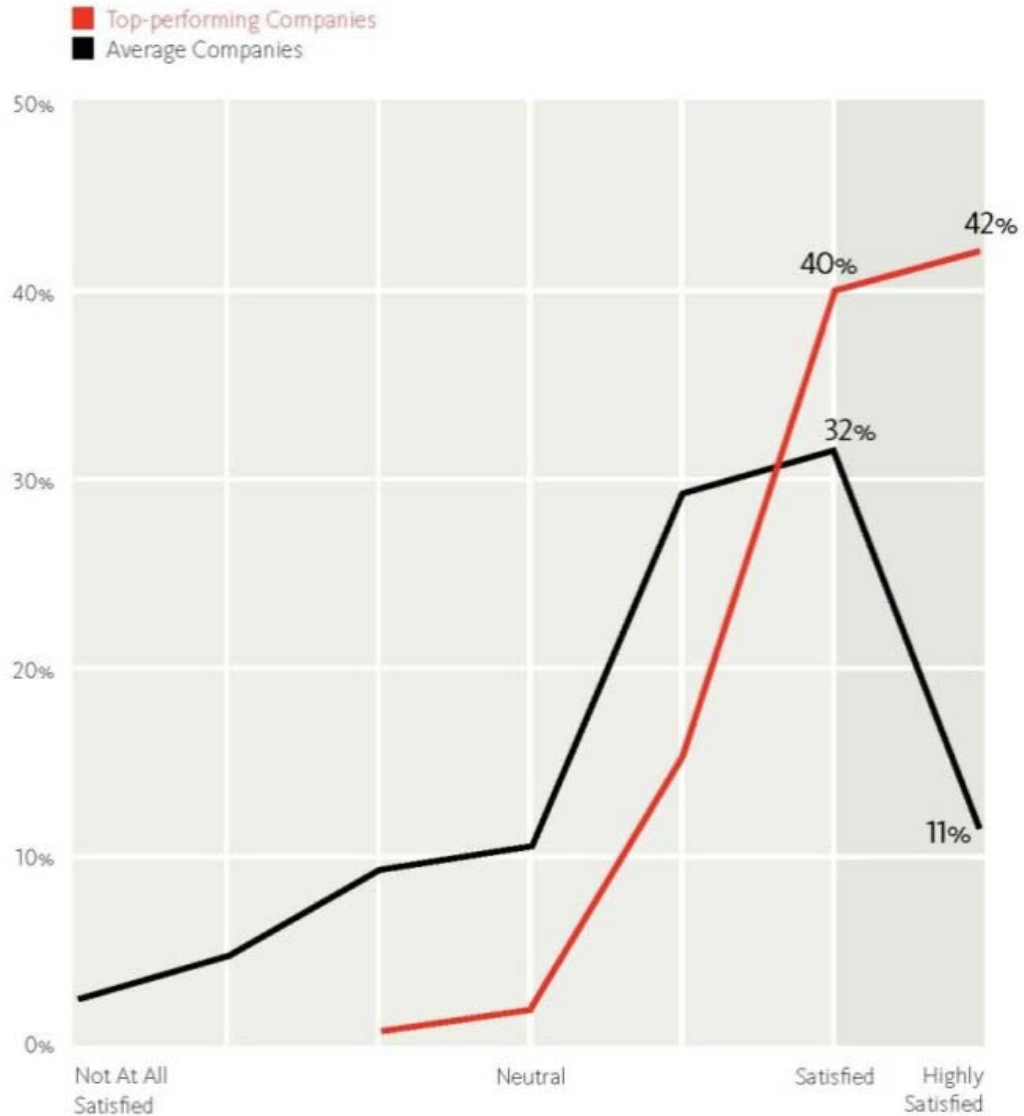


Figure 22 Workplace Satisfaction chart (Gensler 2008, 11)

Satisfaction in the workplace has been a major contributor to employee and company success. As stated above, average companies are least satisfied in their working environment than top companies who believe their work environment has improved their workspace. In the highly satisfied column, a dramatic difference occurred, a 31 percent difference, meant eating at a fast-food restaurant compared to eating at a 4-star restaurant. The difference is quality over low standards.

VERY SATISFIED/SATISFIED WITH WORKPLACE

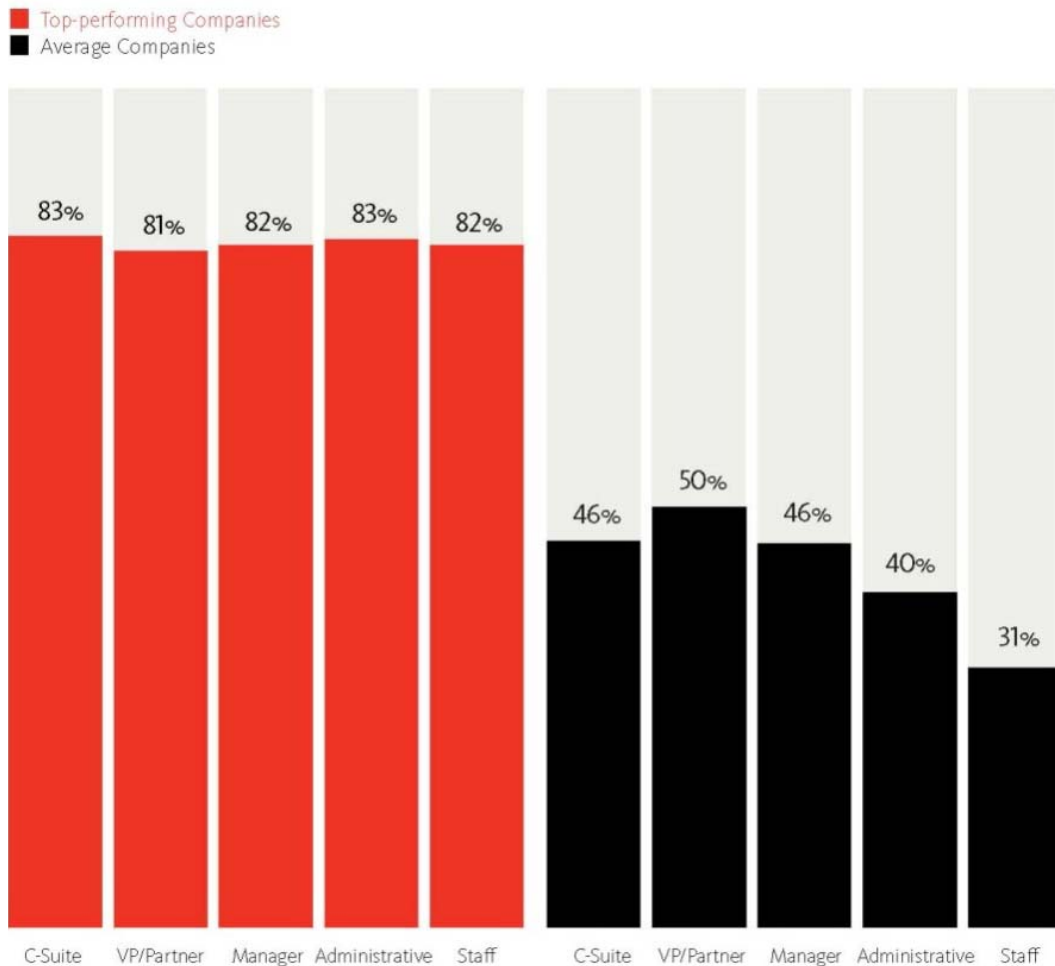


Figure 23 Very Satisfied/Satisfied with Workplace (Gensler 2008, 11)

When surveyed under general satisfaction of work to employee, top companies received even marks across the board. Everyone from lower to higher position employees believes efficient work environments are essential.

What does that mean? Architects and designers need to design workplaces with several key factors. The first factor is based on the company program and what is required in the office setting. What separates average companies from top companies is the voice of the employee is heard and responded to, among the top companies. Employees who took the survey in the pre-evaluation commented on current workspaces extensively. After completion of the new workplace, employees commented in the post-evaluation survey. Their results indicate a higher percentage of work satisfaction.

Conclusion

We found that respondents who have taken the pre- and post- survey have enjoyed their new office design and have become more productive and efficient in the office. Gensler's study has shown in three years, that there was an increase of two-three percent from the first post- survey and the survey taken in three years before. This chart represents the companies' profit growth and annual revenue converted into WPI scoring.

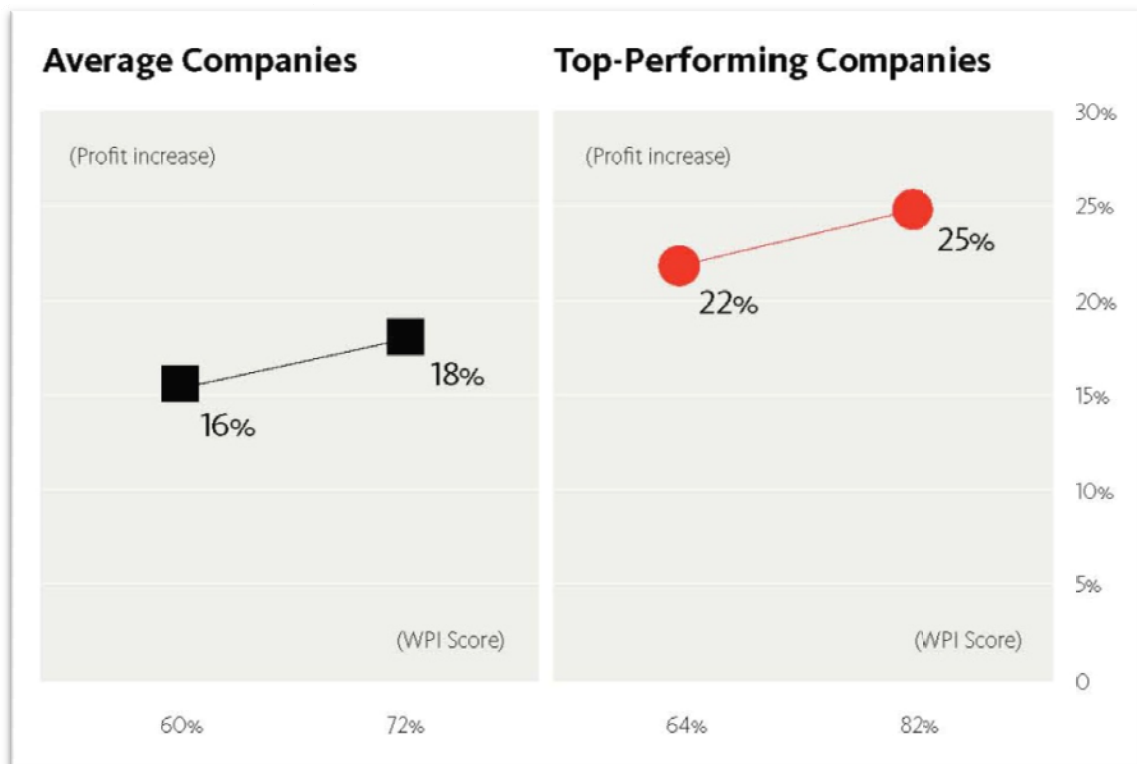


Figure 24 Company Performing Growth in Three Years' Time (Gensler 2008, 25)

As a result of DEGW's WPS and Gensler's WPI survey, industries that work in the office setting are able to understand how employees' work in the workplace has affected design improvements in the office environment.

Design is an unrealized important factor in offices today. As a result of Burolandschaft's office type, companies and employees realize this office environment is too difficult to comprehend and maintain, thus the downfall of Burolandschaft's office design became eminent. As architects and designers, we must understand how different industries manage the office and how certain office types work best in specific settings.

These surveys demonstrate why designing current offices are based on today's trend influence from society and economic ties to the office setting. The evolution of office layouts to new technology offers the workplace new and innovative ideas in creating an

effective design solution for current and possible future problems in the work environment.

The Multi-Functional Office is a set of ideas and innovative design solutions that offer the workplace better work conditions that could potentially improve current work patterns. Through statistic and research, we know that offices that improve work conditions through design have improved and increased employee productivity and job satisfaction. And through the office evolution, economic and social impacts to the office, we know that current solutions would be to improve mobility, flexibility and social spaces in the office setting.

Understanding the history and socio-economical trends in the past and current offices will indicate and detect unresolved and new issues that employees are noticing as counterproductive. Then, Gensler's WPI survey gathers information positive and negative from every employee in order to identify current problems and using their information to make better design offices. Although, clients do not know how valuable a survey is; with good intentions, the WPI survey depicts how successfully completed projects were developed and the satisfaction employees received from it.

The next chapter demonstrates how current workplaces have created such spaces to improve upon the office. Through precedent studies and innovative furniture readily available, we can see how design attempts to improve the office have lead to new and better workplace environments. Presently, these surveys prepared by architectural and furniture companies reveal that office design has strong effects on the employees' efficiency and productivity.

Chapter 3

Design Attempt to Solve New Workplaces

“Offices are no longer just about where we work, explains Tobie Nepo, a commercial interior designer for DRS Architects in Pittsburgh, Pa. Today, they also reflect something important about who we are—and that means clear thinking has to go into creating tomorrow’s workspace.” (McGarvey 2008).

Today, everything we do or act upon is driven by one element, oneself. Everything we do is in relation to ourselves. We drive to work because it’s faster and we eat close to work because it’s convenient. Our way of life is dictated by the actions we produce. McGarvey’s observation above represents a theory that symbolizes the behavior set forth by our habits, actions and activities. The problem that has occurred was set forth by overlapping problems found in yesterday’s workplace. As a result, these overlapping problems haven’t been solved before another idea has been used. The new office should take into account, the client’s desires and the employee’s needs. Top companies create better offices because they listen to their employees. The case studies in this section are based on office design that has been influence by employee behaviors and trends within the office setting to produce better workspaces.

The Multi-Functional office is not different from past office types. Based on how we work in the office, such innovative furniture and creative space planning improves productivity within the behavior patterns we generate. Therefore, this section examines how design office environments incorporate mobility and flexibility in office furniture that paved the way to new applications in space planning. In addition, the multi-functional office will integrate socially interactive spaces that improve productivity and efficiency in employees to task work and projects. The case studies in the office are affected by socio-economic trends created by today’s experiences with office flexible furniture and mobile employees.

The **terminologies** below represent some of the qualities that coincided with alternative solutions outside conventional office planning. They represent some of the new office solutions for current and future trends. In addition, they will be mentioned in this section quite often, please refer back to this, as needed. “All the terms and definitions written below are directly sourced from Steelcase’s 360 Deep Dive, “How Emerging Work Strategies are Changing the Workplace.” (Steelcase 2009).

Definitions

Desk Sharing: A way of allocating workspaces for use by different times; also called hot desking or shared assigned space.

Distributed Team: A group dispersed by geography, often outside traditional office spaces, usually meeting via technology, e.g. videoconference.

Distributed Work: The geographic distribution of work. Distributed workers may be separated by space, time or configuration (number of different, isolated sites). They may be based in one city or multiple cities, meet in person infrequently and communicate frequently via technology.

Drop-In: Unassigned offices used for a short period of time (usually a few hours) by employees who have not made a reservation for a workspace.

Free Address: Unassigned workspaces that can be used by anyone on a first-come, first served basis; sometimes termed group address if the workspaces can be used only by people from a particular group or department. This is similar to just-in-time workspaces.

Group Address: This is an area of unassigned desks used by workers within a particular group or department.

Hoteling: Temporary workspaces assigned through a reservation system; typically used by mobile workers but also used by any worker not near his/her assigned workstation.

Hot-Desking: A way of allocating workspaces for use by different people on different shifts or different days; also called desk sharing or shared assigned space.

Mobile Work: A work style in which a person consistently uses multiple spaces to accomplish their work.

Neighborhood Work Center: An office where people from different companies rent space for use as an offsite work location, also known as a satellite office.

Satellite Office: A workspace owned or leased by the company, smaller than the primary office, used by employees who live near it to avoid a commute.

Shared Assigned: Workspace assigned to several people who work at different days or times, leveraging the workspace for more hours each week.

Third Place: Define as informal, safe, public places where people gather to mingle with others and enjoy the local atmosphere, separate from first place (home) and second place (office). Third spaces include coffee shops, parks, etc. Term coined by sociologist Ray Oldenburg.

Touchdown Spaces: Short-term workspaces used on a first-come, first-serve basis by workers for simple, focused tasks (checking email, sending text messages, online research, etc.); typically small footprint space, often stand-up configuration.

Virtual Office: The concept of the workplace being wherever an employee happens to be working at any point in time.

Case Studies

“From the numbers alone, it looks like the traditional workplace is once again facing a major shift, one that could be as profound as its transition from a bullpen of desks in the early 20th century to its present mix of open-plan and private offices, conference rooms and shared spaces” (Herman Miller, Inc. 2007, 5).

This major shift in transitioning to a new office design results in better workplace satisfaction to employee. In the case studies, we will take a look at current workplace trends designed with two objectives. The first objective is creating new environments for employee satisfaction, while the second objective is to look at how company's apply socio-economical change to the design layout.

The purpose of the Multi-Functional office is to understand how new approaches to space planning can improve the various functions undertaken. The case studies in this section incorporate versatility in work tasks using mobile and flexible office furniture, in addition to the social benefits the space produces. These case studies are considered 21st century office design that demonstrate a level of functionality not found in traditional offices.

Completed Projects

TBWA\Chiat\Day's LA Headquarters

TBWA\Chiat\Day's LA Headquarters commission Clive Wilkinson Architects to remodel a warehouse into an advertising cityscape which was completed in 1998. The original scheme was modified and turned into an urban neighborhood incorporating focus work areas with shared social spaces. These shared social spaces are considered public facilities accessible throughout the entire warehouse.

Figure 25 shows the floor plan of the LA headquarters. The single red highlight is the main street through the warehouse. Personal and Social spaces are located on this axis. All other facilities wrap around, this includes smaller workstations and project meeting areas.

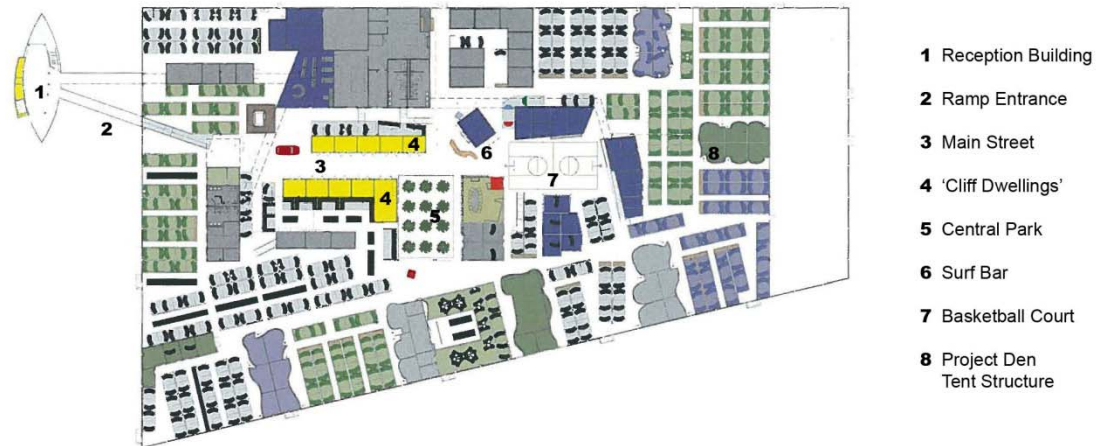


Figure 25 the Ground Floor Plan (Myerson and Ross 2003, 193)

One of their short-lived concepts designed in the Venice office created pockets of space called ‘cliff dwellings’ (see figure 26) that would be empty at the start of every day. Employees would grab a mobile phone/beeper and a laptop, and scramble for a desk every day. However, “the company’s former premises in Venice, California – designed by Frank Gehry with a binocular portal by Claes Oldenburg – an unpopular ‘hoteling’ system had made for a dissatisfied workforce unable to call any part of the office their own.” (Myerson and Ross 2003, 192). “As it turned out, ‘The Virtual Office’ sounded well in theory, but ultimately violated human tenets, says Lee Clow, the company’s chairman. He added, ‘People need a sense of place and belonging.’ The idea behind the virtual office was that telecommuting would allow people to work anywhere, anytime, and that they would use the outgrown building only for teamwork.” “As it turns out, most staff members needed or wanted to work under the same roof.” (The New York Times 1998).

The concept carried over to the LA Headquarters but was modified into fix personal workspaces instead of free addresses. The LA headquarters converted the ‘cliff dwellings’ into personal workspaces for employees to use. At the same time it created informal areas within the urban social landscape for individuals and groups to work in.



Figure 26 'Cliff Dwelling' (Myerson and Ross 2003, 195)

TBWA\Chiat\Day's LA Headquarters main concept broke free from Taylorism in creating a community based design. Today, the community concept remains successful – employees are using the pocket spaces as personal space and the public amenities as flexible areas of work and/or recreation.



Figure 27 the Urban Neighborhood overlooking 'Central Park' and the 'Cliff Dwellings' (Myerson and Ross 2003, 192-193)

“Although majority of the meeting or ‘project dens were created in ethereal double-height fabric enclosures surrounding the custom design workstations called ‘Nests’ that were encircling the city center’.” (Myerson and Ross 2003, 192). The concept of the urban neighborhood creates various spaces of formal and informal interactions. These

social spaces can lead to individual or group interaction for work and recreation. Even though there are specific areas of work, the in-between spaces present other forms of contact, communication and interaction. Therefore, the implied social spaces are multi-functional in use.

“The project was completed at the end of 1998; it was widely heralded as 21st century in its thinking.” They brought down “the curtain on a series of ruthless, space-saving, desk-sharing schemes in the 1990s, reviving a more generous, neighborly approach that has been widely studied and emulated since.” (Myerson and Ross 2003, 192).

Beacon

“When three Japanese advertising agencies merged into one Tokyo-based firm, the newly formed Beacon wanted to encourage as much social interaction between employees as possible.” (Myerson and Ross 2003, 168). The concept was to create an environment that encourages sharing and interacting in ideas to pursue more collaboration between all levels of employees.

Due to its column-less floor plan, this four level longitudinal rectangular floor plan is flexible and has an openness quality. The elongated plan inspired the concept of the ribbon which runs parallel to the train station below the building. The ribbon runs through each floor representing a different theme. Each theme embodies a function, material and color choice selected from the four elements of: Man, Women, Family and Community.



Figure 28 each floor represents a different theme (clockwise) Man, Women, Family, Community (Myerson and Ross 2003, 170-171)

The ribbon theme on each floor is represented in the images above. ‘Man’ is one of the ribbons symbolizing the color steel. On this floor, the steel ribbon is weaving through space creating different compartments for mid to large group interaction. This includes conference and informal spaces of work. The ‘Woman’ floor is displayed in “pink snakeskin-covered ribbons that accommodate a beauty salon, loft beds and individual focus areas of work.” (Myerson and Ross 2003, 170). These spaces are genuinely private with little space for group interaction, they are intimate and personal. The third floor has a wooden ribbon demonstrating the word ‘Family’. ‘Family’ is shown as a place of higher social interaction with informal group work areas. This floor visually shows structural elements and furniture representing the wood theme. The last theme represented in a ribbon is ‘Community’. ‘Community’ has the most public facilities incorporated into the design; this is where high use of public and private interaction goes on.



Figure 29 the 'Dining Table' (Myerson and Ross 2003, 172-173)

In addition to the main concept, the inspired collaborative space used by upper management to create a non-private shared table experience. “The six directors and the company president work at a dining table 12 meters long, and anyone in the agency can pull up one of 20 dining chairs for a chat.” (Myerson and Ross 2003, 168). The dining table represents the Japanese word ‘okarinasai,’ which means ‘welcome home.’ This cultural terminology is supposed to bring company success and good relations between client and company. This office re-interprets the definition of what a traditional Japanese office would look like in the 21st century.

The purpose of this case study is to look at how various social spaces can be integrated within portions of the focus and collaborative work modes. The concept demonstrated within each ribbon shows how multiple work modes are able to be created for various tasks recommended per department or division of that office floor. The ribbon holds all the essential functions required by the floor. A multi-functional space is not necessary. The each floor’s ribbon has different social activities and task spaces for the task required. Employees can work on any floor depending on functions they require for that time period. Multi-Functionality is created in the between spaces of the ribbon. This is an alternative approach to the Multi-Functional office.

Neue Sentimental Film

This unique company was designed by GRAFT Architekten and completed in 2002. Neue Sentimental Film is an internationally known advertising film studio producer in California.



Figure 30 view of the Independent Office Towers (Pogade 2008, 76)

The concept is based on 'office sharing and/or shared real estate'. Freelance and independent directors during the time frame of their project scope can rent units in the warehouse office. Each of the rental units operates as individual office for independent companies to use and occupy roughly 120 square meters of space. Each rental unit or tower has two floors and accommodates up to eight people.

They total five office towers and share the permanent stations known as the common areas. These common areas such as reception and conference rooms are located on the ground floor around the office towers (highlighted in green, figure 31). "Rooms and infrastructure are used by both permanent and temporary subsidiary films." (Pogade 2008, 77).



Figure 31 the Ground Floor Plan (Pogade 2008, 82)

“An interesting fact about the material choices, the floor covering was made of ‘Recycled Rubber Granulate,’ from the American Recycling Center, Inc.” (Pogade 2008, 77). In addition, the conference and individual workspace are designed from used shipping containers. The conference or discussion room is unique for its flexibility to open up or stay enclosed while meetings are in session. Depending on how the meeting space is used, the exterior walls can rotate outward, opening the room to various functions.



Figure 32 the Shipping Containers were converted into a Large Discussion Room (Pogade 2008, 80 & 83)

Going back to the independent office towers, out of the five, Neue Sentimental headquarters take up one unit. The next two are used for subsidiary films and the last two units are used for galleries and/or temporary work groups.

Overall, the warehouse contains five office towers and other public amenities that represent reusable material and flexibility of tenant occupancy. Office sharing can be highly beneficial depending on industry and business. This is an ideal example of sharing spaces with other businesses during poor economic times. During times of recession, each tower could be rented out, or when business gets better, the company could occupy the units. Therefore, the functionality of the office tower plays a major role in the fluctuation of the economy.



Figure 33 view of the Independent Office Towers (Pogade 2008, 78-79)

Mother

This small boutique company has grown into a recognizable agency in British advertisement. In 2004, they moved into the former Tea Building in Shoreditch District, London. Roughly 200 employees occupy this 3,904 square meter office floor designed by Clive Wilkinson Architects. This famous office was inspired by the concept previously used in TBWA\Chiat\Day and Foote Cone & Belding. (Foote Cone & Belding has a concept similar to the urban landscape used in TBWA\Chiat\Day's LA Headquarters.)



Figure 34 a Computer Generated Model Isometric Floor Plan View (Myerson and Ross 2006, 50)

The concept was to design a community based floor plan with empty work stations on a single race track-like concrete table where employees would plug in and work. Every

three weeks, employees would rotate seats around the singular table which wrap around the entire floor plan. The seating arrangement was strategically placed around the concrete tables in order to form new interaction and collaboration spaces that went against traditional managerial styles.



Figure 35 the All-for-One 'Kitchen Table' Concept (Myerson and Ross 2006, 51)

“Mother’s original partners were determined not to abandon their all-for-one ‘kitchen table’ ethos when they moved to a new office.” (Myerson and Ross 2006, 50) This idea inspired by “the Fiat factory’s race track that symbolizes speed and mobility in working life.” (Myerson and Ross 2006, 50).

“The client actually wanted a wooden table” (Myerson and Ross 2006, 50), but the architects found a better solution when they created a special ‘cement mixer’. (Myerson and Ross 2006, 50). After construction, this table became the largest work counter ever built, roughly 250 feet long and 3 inches thick. The staircase leading to the reception area below is the only break in the circular form. The reception area shown below initially starts the race track-like concrete table, then the form goes up and circles the company’s interior like a race track. The images below show the starting point of the race track as it enters the main floor.

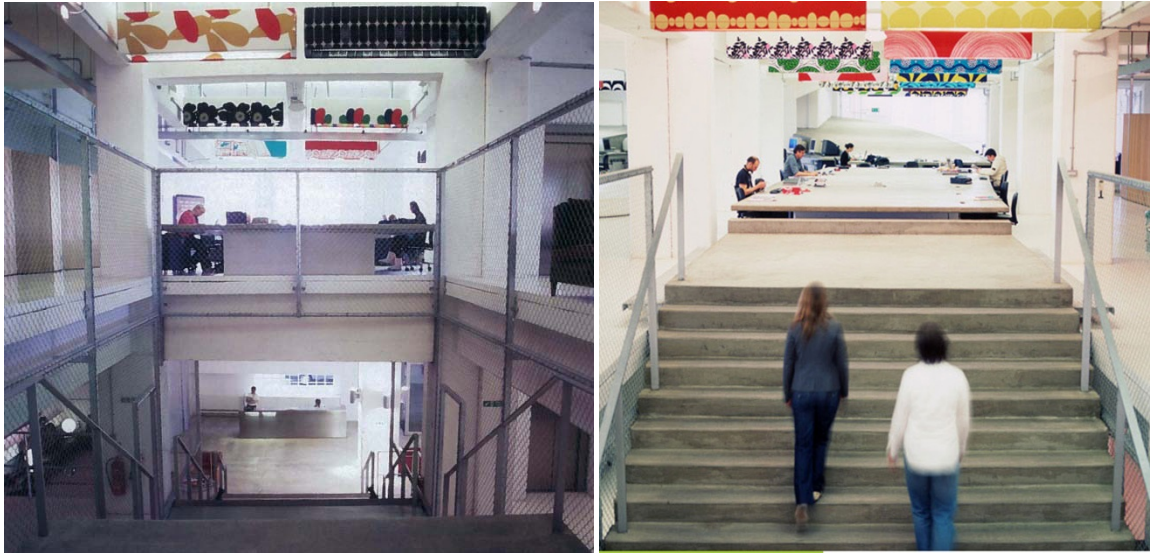


Figure 36 Views from the Staircase (Left) Lobby and (Right) Main Floor (Myerson and Ross 2006, 52) (Hill 2006)

Above the work table are lampshade fabrics, framing the width of the table. They are used to softened lighting and acoustics in the different sections of the concrete table. In addition, the concrete table forms different areas of individual or group task work. Looking closely at the floor plan, specific areas have more collaborative and/or informal group setting. In the floor plan, various types of informal and private conference spaces are shown around the inside edges of the building's edge. They represent the formal gathering areas of the firm where client/consultant to employee interaction occurs more frequently.



Figure 37 the Main Floor Plan (Hill 2006)

The two images below show the different spaces created by the concrete race track like form. These spaces vary in form and people interaction, therefore flexibility in work tasks can vary depending on location of working space and assignment. The image on the left could be used for small informal meeting space or semi-private work stations for

individuals. It provides some level of privacy as it's indirectly linked to the race track. On the other hand, the right image generates highly interactive open spaces for employees to use that includes sitting areas for individuals to work and/or to create group sharing activities.



Figure 38 Views around the Office (Myerson and Ross 2006, 53) (MotherLondon 2010)

Mother's race-track table concept is an excellent example of creating multi-functional focus work areas. The concept, similar to TBWA\Chiat\Day's Venice Headquarters concept did more than just create temporary workstations. Mother's design made sure people change seats every three weeks for a reason. One theory is that creating a new seating arrangement every three weeks will keep employees from hoarding personal belongings in the workplace. Unassigned seating forces employees to only use the office for a single purpose. That purpose is to collaborate, interact, and meet when employees need to. This method reduces the energy consumption, while fluctuation in employment would not have a strong impact on other employees in the workplace.

Happy

Completed in 2001, this design agency wanted "to create an office that would be 'intellectually liberating' and enhance the group dynamic through 'collective individualism'." (Myerson and Ross 2003, 142). In order to encourage 'collective individualism', White Arkitekter deliberately made a communal space not to suppress traditional work habits.

Part of the concept is "the 'Intensive Care Area' designed to be the gathering area of activity—a shared space at the center of the community, where communal breakfast starts every day." (Myerson and Ross 2003, 142).



Figure 39 'Intensive Care Area' (Myerson and Ross 2003, 143)

In figure 39, left of the black column; carrels also known as the 'nest' function as detached workspaces for individuals to use. These individual carrels encourage people to use different work stations depending on type of social, task or group work surrounding the 'nest'. Depending on work function the 'nest' and community/group areas offer different setting for two functions; the public and the private. The highlight area in yellow, shown on the floor plan, figure 40, is the individual carrel units or 'nest'. The public or social areas are everything not shown in yellow highlight.

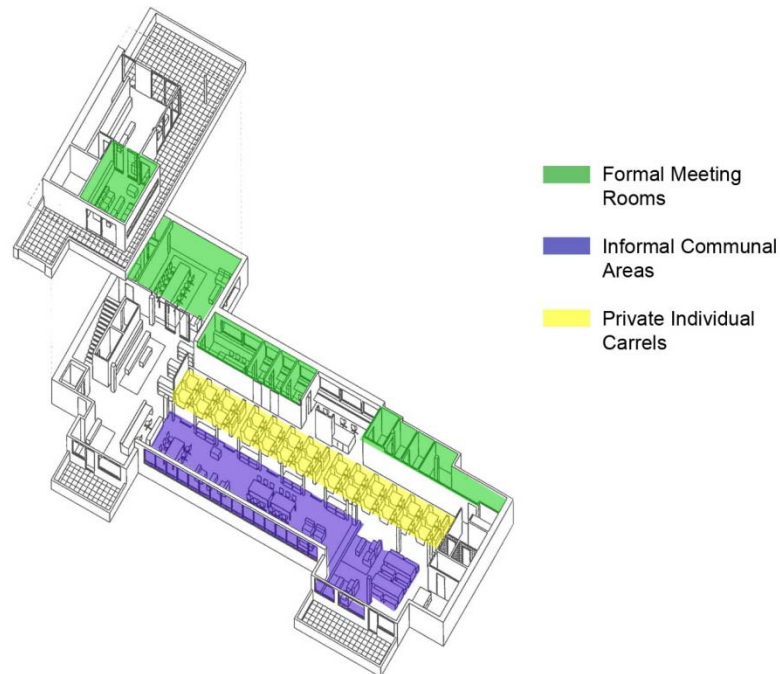


Figure 40 an Isometric Floor Plan (Myerson and Ross 2003, 146)

The floor plan in figure 40 shows the distinction between shared/communal spaces (highlighted in blue and green) surrounding the private individual carrels (highlighted in yellow). The cluster of communal areas shown around the ‘nest’ creates a different office setting for people to work in; they are used for social interaction/collaboration, team brainstorming, formal/informal meetings and private team rooms. These private rooms on the North face of the longitudinal office and on the second floor provide isolated relaxation or group meeting areas. Depending on the type of task work the individual carrels provide a temporary place of work closes to the communal areas. In that regard, the carrels become temporary places of work for the internal mobile employee.

[Haworth and Herman Miller’s research has found similarities in types of mobile employees considered in this category of defining the mobile worker. One type of mobile employee, the internally mobile or office-based mobile worker is defined as “someone who spends most of his/her time in a company-provided office, but who also sometimes works at home or in a third place” especially in this case study the driving concept was to design an office based on internal mobile employees who critically use various office functions throughout the day.]

The images in figure 41 are the communal and enclosed gathering spaces available around the firm’s ‘nest’ area. Depending on the activity the interaction or privacy required creates an environment best suited for that function. Employees who work in these gathering areas are able to plug into any nearby individual carrels anytime.



Figure 41 (Left) a Communal space and (Right) an Enclosed Space (Myerson and Ross 2003, 146-147)

McKinsey & Company

The top floors of the famous Renzo Piano building in Amsterdam, Netherlands is the home to McKinsey & Company management consultancy firm. Completed in 2000, this 900 square meter office created an unusual and inspirational workplace in an innovative office setting.

The concept was to improve assistance to clients and improve business relationships. “By creating an ‘incubator space’ for helping clients set-up e-businesses.” (Myerson and Ross 2003, 86) the firm played a crucial role in changing the traditional office into a new modern office environment. The vital change in office environment came from the flexibility of spaces addressing the issues of client and employee collaboration. A project team would consist of two to six people. Spaces had to develop a natural separation between collaborative and concentrated workspaces. Spaces must be able to hold meetings for large numbers of clients ranging from one to 60 people. This floor incorporated various size meeting rooms in a cellular office setting, while integrating individual workstations around the office. These workstations are located in some of the conference rooms and in the public accessible areas. Depending on what type of meeting or collaboration is being utilized this floor accommodates for: desk sharing, drop-in, distributed team areas, distributed work, free address, touchdown spaces, and hot desking.



Figure 42 Floor Plan (Myerson and Ross 2003, 88)

In general, the architects designed several types of Multi-Functional team rooms. Specifically the lounge tables, dashed in red are called cockpits or cocoons are flexible in design for informal team meetings, concentrated work, and/or social recreation. The cockpits are custom designed lounge tables in a semi private work setting that provided solutions for 'unpredictable work requirements from both internal and external people.' (Myerson and Ross 2003, 86).

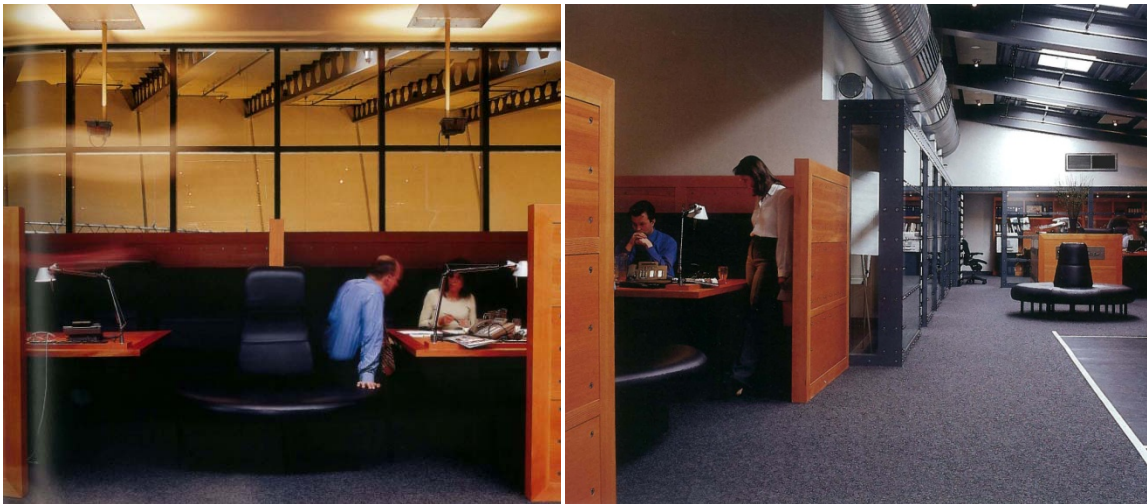


Figure 43 Cockpits or Cocoons Spaces (Myerson and Ross 2003, 87-88)

Above this floor is the main floor to the McKinsey & Company management consultancy firm. This level can be directly accessed from the main floor using the main stairwell. Each employee has an individual casual workstation on this floor. The workstations are grouped in small hives with an informal meeting space. The casual workstations were meant to change from the traditional work environment by lowering workstation panels

and creating an openness quality that originally isolated employees. The casual environment is meant to increase employee interaction and collaboration that conventional offices did not offer.



Figure 44 Casual Workspaces (Myerson and Ross 2003, 89)

Bothe Richter Teherani Architectural Bureau

Bothe Richter Teherani Architectural Bureau rented two floors in this building that they designed and completed in 2002. The firm overlooks the future Harbor City in Hamburg, Germany. Each floor is approximately 3,400 square meters with views overlooking the harbor, while allowing natural air and sunlight to enter.

The building's central system has vegetation at the bottom that creates a visual and aesthetic imagery for employees to view from their offices. The building incorporates a three-story-high opening that brings in natural ventilation and sunlight into the garden. The garden becomes a place of relaxation or a retreat from the office. It serves as a social gathering space that could be recreational or informal. In addition, the garden and building has external views of the harbor and surrounding neighborhood.



Figure 45 Deichtorcenter designed by Bothe Richter Teherani Architectural Bureau (Pogade 2008, 46)

“Within the office, the planners have made breadth and openness a high priority.” (Pogade 2008, 47). Hadi Teherani was the head designer and one of the principals to enhance the openness spatial environment for multiple types of activity. This encouragement of spatial quality was considered in the material and furniture selection that influence the task work and function of the office. Therefore, as part of the spatial quality “the adjusted walls are of glass and the furniture and wall coverings are of translucent acrylics.” (Pogade 2008, 47). This will improve the light quality and privacy to the internal spaces. In addition, the floor is made of translucent PVC material improving the three-dimensional affect of the space while artificial light shines through it. The floor material has a layer of transparent covering held up by silver-white supports to enhance the light quality entering the space.



Figure 46 Used as a (Left) Cafeteria and (Right) Communications Counter (Pogade 2008, 48 & 51)

The main work area has incorporated several types of furniture depending on work task or department type. Most of the office furniture have adjustable height table tops and the flexibility to be rearranged, if necessary.



Figure 47 View of the Working Area (Pogade 2008, 50)

Perhaps, one of the greatest inventions used in the office is called the St@ndby Office furniture, also designed by Hadi Teherani. This specific type of office furniture constructed by Konig & Neurath is considered to be “the mobile all-in-one office.” (Pogade 2008, 47). This ‘all-in-one office’ is a fully functional mobile workstation that is considered one of the most innovative designs created for mobile employees to use. (Please refer to office furniture in the next section for further information concerning the St@ndby Office). When placing this office furniture in the right setting, the space is flexible for various functions. Depending on usage, the space could function for either individual work or communal workstations. The current use of this furniture type is for mobile employees.



Figure 48 the St@ndby Office Workstations (Pogade 2008, 46)

Flexible Furniture

“Flexibility—for instance, setting furniture on casters so it can be rolled out of sight, and building workstations with desktops that adjust for height—is another critical element in the 21-century office, says Nepo. When two, three or possibly more workers share a workspace, it must be able to meet each individual’s needs.” (McGarvey 2008).

In reference to McGarvey’s observation above, appropriate furniture will increase the productivity and satisfaction of the employee working in the office. Until now specific spaces within the office start to gather for various activities (unknowingly). When this occurs the furniture must respond and translate multi-use, multi-task, and multi-functional. Projects analyzed in the previous segment begin to respond to these conditions by developing multi-use environments in specific spaces on the company floor.

Statistics in the previous chapter explained how design improves employee work habits. Office furniture has to respond to the design criteria that the employees need. Offices that use flexible furniture can improve the way employees work, while reducing the amount of wasted time people spend in conventional office environments.

Unique and modern ideals recently developed, by architects and furniture designers have pushed the boundaries on flexible furniture. Office furniture, in this chapter has adopted various functions specific to the purpose of the Multi-Functional office.

The St@ndby Office

This mobile workstation was created in 2001, by designer and architect Hadi Teherani. This unique and innovative piece of furniture is considered the first modern mobile workstation to be designed. This “fully functioning working place which folds together like a built-in cupboard and can be pushed on rollers as desired. Cable leads and workplace lighting are integrated; further organizational elements such as height-adjustable working plates allow for an individual formation of working place.” (Hadi Teherani AG 2009). This 146 cm x 74 cm x 190 cm mobile station is built with steel, aluminum, and/or wood depending on office environment. Popularity of this product is increasing and has recently been noticed by European companies.



Figure 49 the St@ndby Office (Hadi Teherani AG 2009)

This workstation costs approximately \$6,500 USD manufactured in Germany and distributed in Spain. However, information is limited on this product. Currently, the St@ndby Office is showcased and used in the Bothe Richter Teherani Architectural Bureau.

The reason why this workstation is so desirable compared to its predecessor, is based on two criteria that affected the design functionality of the furniture. While other workstations folded into a large, narrow dressers or closets and fixed to one location. By mounting the frame onto wheels, this office furniture now becomes mobile compared to its predecessors. The workstation is smaller in size, lighter and adaptable to various environments.

This mobile and portable workstation is multi-functional in an office setting. It could be applied to specific spaces where client and consultants would temporary meet at the office or a place of free address. Either way, this experimental workstation proves that workstations can be mobile workspaces and flexible to individuals using it.

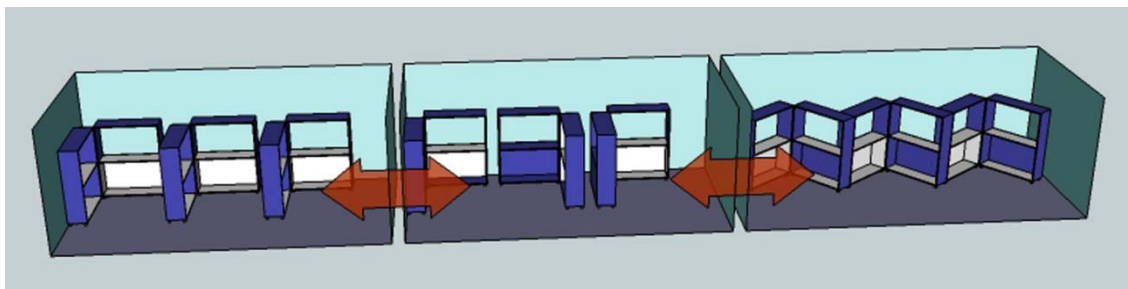


Figure 50 the St@ndby Office adjusted to function within a single space (modeled by: Ryan Yee)

Four Works

This creative home office system was design by Patricia Terrazas and Michael Svare in 2009. They are designers at Four Design Company in Denmark. The concept is based on the firm's philosophy of designing the perfect contemporary workplace. In general, this workstation is multi-functional for its practical design, flexible equipment and mobile 'all-in-one' seating and working.



Figure 51 Four Works Workstation (Four Design 2009)

This mobile station currently comes in two colors black and white. It includes built in power conduits, a fold out table and fixed task lighting. In addition there is shelving units around the exterior of the seat with coffee cup holders. Although it was made for the home office, the company says this workstation can also fit into an office setting, small or large. The portable workstation can fit into the office as free assign or hot desking for consultants and clients to use. Employees could use this workstation as an individual or social workstation depending on usage. Although this workstation is limited in information a single station is compact and easy to relocate and comfortable to work in.



Figure 52 different views of the Four Works workstation (Four Design 2009)

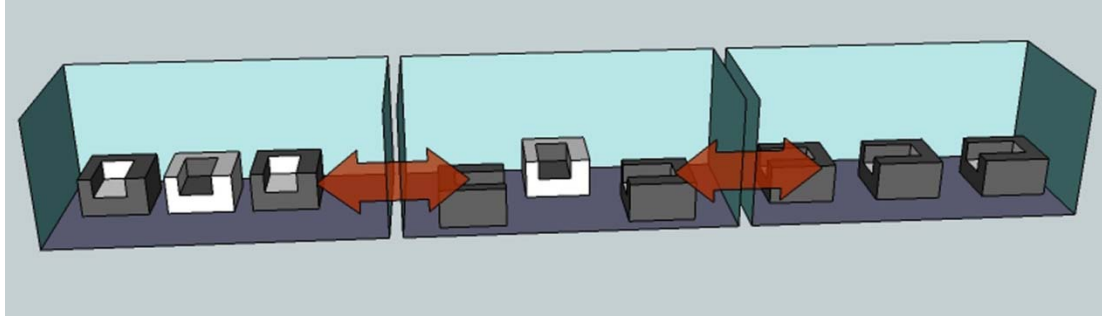


Figure 53 Four Works adjusted to function within a single space (modeled by: Ryan Yee)

Similar forms of this workstation have been developed, but nothing like this. Companies such as Google and the GooglePlex have workstations such as this, located in social areas of the complex. In addition, Globus Artifort created a popular model of this unit several years before, called the All-In-One Computer Workstation. Although it is highly attractive, it never achieved the popularity it deserved. Also, the workstation is able to close up into a ball when not in use. Figure 54 displays this All-In-One Computer Workstation.



Figure 54 Globus Artifort's 'All-In-One Computer Workstation (Furniture 2007-2010)

'Four Works' is the kind of multi-functional furniture that has the potential to fit into almost every office industry possible. This mobile and compact workstation will fit into any office setting where employees want the change in atmosphere while working comfortably. Or to the consultant and/or client who needs a temporary workstation to plug-in and use while at the office.

Bungee Tables



Figure 55 (Left) Bungee Table unit and (Right) Bungee Table configuration (Global Upholstery Co. Inc. 2009)

Bungee Tables are designed and distributed by Global Total Office Manufacture. What defines this office furniture as innovative and flexible is best described through the use of bungee cords. This single table unit is roughly 28 inches D x 60 inches W with four types of leg options and is able to be adaptable to any style of collaboration or meeting area. This is the best table to use for versatile collaborations. Figure 56 shows the types of configurations Global Total Office has created for this multi-use flexible table.

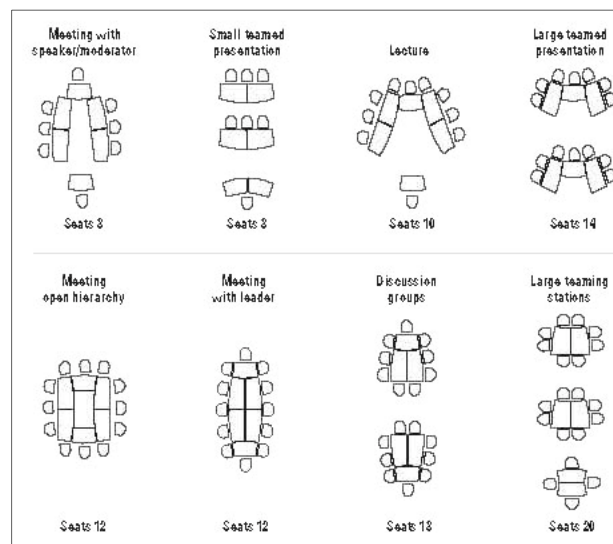


Figure 56 Bungee Table configurations for Collaboration and/or Meeting Spaces (Global Upholstery Co. Inc. 2009)

This table is specified with bungee cords built onto the underside of the tabletop. The bungee cord serves several purposes regarding connection to other bungee table units. On their website they show a short video explaining the purpose of the so called 'bungee' attachment which was designed to connect several bungee tables together, when they are combined or when they are not in use. Figure 57 shows the bungee cord system under the table top. Each table's bungee cord system is able to stretch to the require length of one additional Bungee table and able to hook onto a mechanical piece

order to stay connected. Meanwhile, the table is able to flop vertically on its side in order to conveniently roll into storage or another space. When the table is 'nest' into this position, the bungee cord is able to brace the table in front of it.

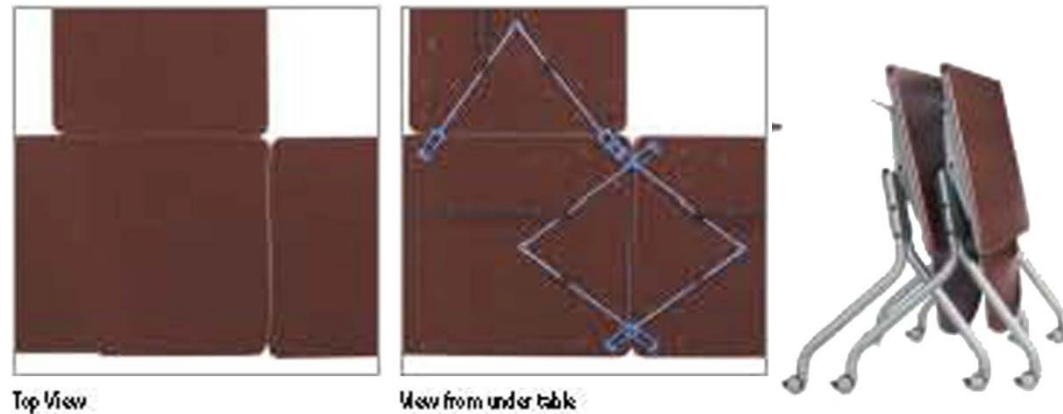


Figure 57 (Left) Bungee Cord system and (Right) 'Flip-Flop' position (Global Upholstery Co. Inc. 2009)

The tabletop is approximately one inch thick and varies in laminate finishes. Overall, the tables are able to reconfigure at any time and comes with a low panel below one face of the Bungee table. It has the potential to create multi-function meeting spaces with the use of a simple table top. And it comes in one individual unit with legs like spiders on casters. This system was cleverly designed for employees who incorporate multi-activities within a single space. Or it was design for companies to encourage and improve collaboration among co-workers.

In conclusion to this training/conference table, other companies such as Kimball Office has produced their own version of this furniture called 'Scenario Tables.' In addition, Herman Miller is the distributor for a similar table from Bretford called the 'Rhombii Flip Top Mobile Training Tables.' Regardless the individual tables are portable, mobile and flexible to various activities and adjustable in height or storing position. They are bungee cordless but come with a privacy screen and optional rollers.

The Multi-Functional office could use office furniture such as this. It has the flexibility to be configured into any position and/or type of layout suitable for function, see figure 58. The configurations could be for temporary individual units up to large conference size formal meeting areas.

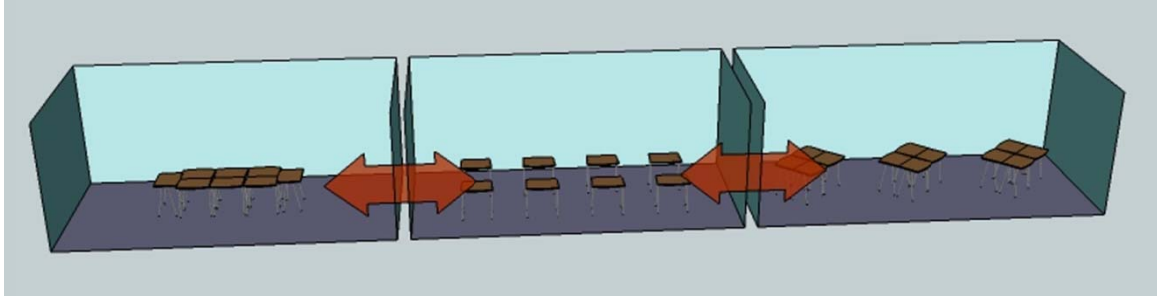


Figure 58 Furniture flexibility within a single space (modeled by: Ryan Yee)

The 'Silver' Chair

Hadi Teherani also designed the 'silver' chair and is considered the first modular office chair with an adjustable back rest. This four-part office chair can be used for various functions from the conference room to the executive offices. By deconstructing or constructing the chair's back rest, different heights are shown to emphasize the type of work it benefits.



Work Chair

Figure 59 the Silver Chair (Hadi Teherani AG 2009)
Conference Chair

Desk Chair

Executive Chair

This exact chair could be reconfigured to four different heights. The image above displaying from left to right illustrates: the work chair, the conference chair, the desk chair and finally the executive chair showing the versatility it serves to function. This remarkable sitting device can be reconfigured for new employees or adjusted to executive management. This chair is priced at \$5,500 USD and also manufactured in Germany. Recently, Kimball Furniture Company has been the American region distributor of this product.

On the bright side, this is not the only multi-task chair out there. A famous UK office design company called '3Sphere' created the three format multi-functional chair. "The Charta chair conveniently comes in three different formats: executive, lounge, and conference, and is made from polished aluminum, high gloss plastic, soft Black Nappa leather, padded armrests, and features individual adjustment mechanisms and support for the back and arms." (The Office Design Blog – Office Design Ideas 2009). It is manufactured in Frankfurt by K+N City and cost 1430 GBP.



Figure 60 the Charta Chair design by 3Sphere (3Sphere 2009 2009)

Ergonomics is critical in the office. The office chair is the first thing the individual will react to while on it. Many office chairs are design specifically for one type of task work; in any case the work chair should be able to function differently to the various types of assign work the person acquires.

The 'CityHall'

Design by Kevin Krumnikl and Krumnikl Environment, this tabletop and storage cabinet is called 'the CityHall'. This simple design storage is minimal in feature and able to swivel separately four internal cabinets. In addition, access to the cabinets is located on two faces (front and back) without encroaching onto the walkway. The CityHall is dimension at 245 cm x 45 cm x 90 cm and comes in Walnut or Birch. Cost is unknown, while information is limited.



Figure 61 the 'CityHall' in Different Formations (Krumnikl Environment n.d.)

This type of shelving or storage units combines functions of work. Different from the other case studies, this office furniture serves as a facility for shelving objects, while working on a long and wide table top. The multi-functional point to make comes from the amount of space it does not take. Typical shelving units either don't have this depth or has to extrude out taking up circulation space.

The 'Growing Family' Kitchen

Electrolux ICON and Interior Design Magazine collaborated for this yearly competition. In 2008 Marcello Zuffo won the competition with this creative modern residential kitchen. The concept is expressed through a singular rotating mechanical part where portions of the kitchen rotate up to 180 degrees. Although it is intended for the 'Growing Family' as Marcello Zuffo desired. His futuristic design initially met the needs of the modern family in today's era.



Figure 62 Marcello Zuffo's 'Growing Family' (Interior Design Inc. 2007-2009)

Even though this concept was intended for residential kitchens, this idea of creating a futuristic kitchen such as this could benefit the current office setting. If the rotating mechanical part is fixed to one location, the components revolving around could swing 180 degrees and adjust to different situations. This would yield different results within the same space. Although this kitchenette is limited in information this project won \$100,000 in prize money.

This kitchenette is flexible in design and produces multi-functional spaces when used correctly. It has the ability to swivel around possibly 360 degrees in an open space creating new environments for social interaction, dining and/or lounging.

Traxx and Tiles

Created by Kimbal Office, "this wall partition system attaches directly to the existing walls and is able to traverse columns and other building obstructions." (Kimball Office 2010). This tiled surface becomes a useable surface for hanging objects, writing/tackable surface and/or a plane for mounting system furniture. What use to be an architectural constraint, is now a resourceful source in the office environment.



Figure 63 Wall Surface with Traxx and Tile System (Kimball Office 2010)

In figure 63 and 65, the wall and tile system “allows placement of panels, components and work surfaces” (Kimball Office 2010) to be fixed on a horizontal mounting structure. The Traxx rail attaches to horizontal supports while interchangeable with various tiles, even slat can be used. In addition, the Traxx and Tile system can be mounted to existing building’s internal office surface as long as there is light gauge framing and/or concrete walls. This tile system can go as high as 49 inches.

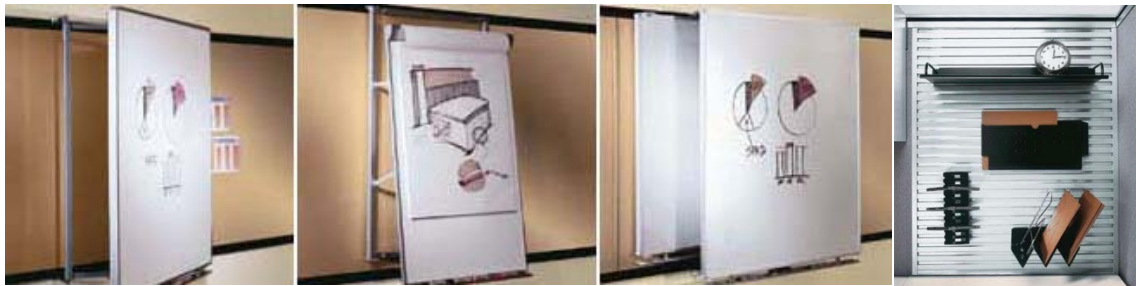


Figure 64 some Applications to the Traxx and Tile system (Kimball Office 2010)

Although information is limited, the multi-purpose use of this system can mount everything such as marker boards that swivel on the sides, charts held with angle mounting, flex boards that can rotate over tack boards and outfitted utility walls for hanging files and other items. This is ideal for conference and meeting rooms to the office floor where the partitions can mount to the system furniture as shown in figure 64.

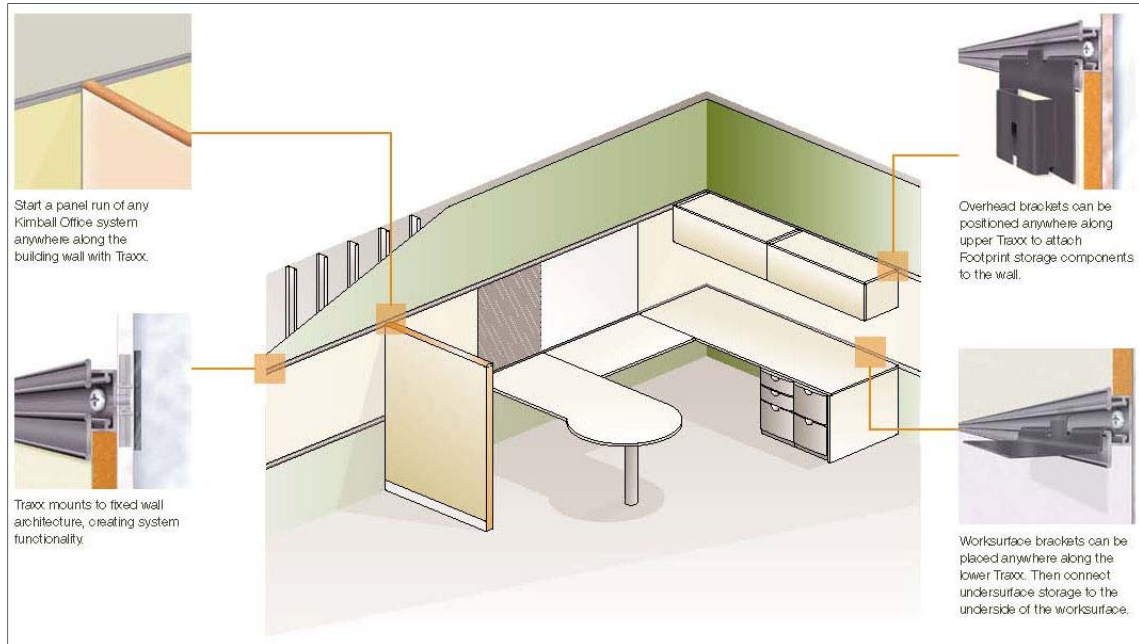


Figure 65 System Furniture Mounted onto Traxx and Tile System (Kimball Office 2010)

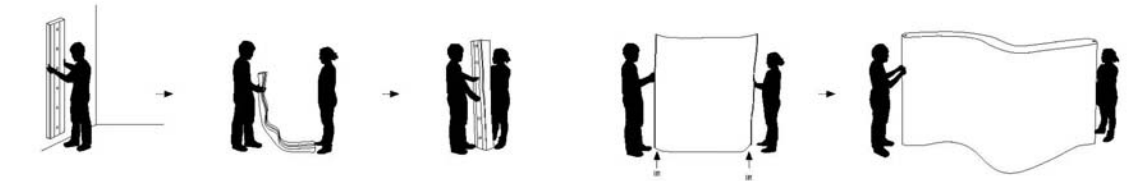
Paper Softwall

Recently developed by Molo Studio is this Paper Softwall. This textured wall is formed by multiple layers of honeycomb patterns that are able to span long distances from a thin sheet of material. This free standing wall costs approximately \$3,600 USD specifically for an 18 inches wide x 8 feet high Softwall (maximum span cannot be determined). While it comes in two colors black or white, this material is able to integrate LED lighting within the honeycomb material. As a result, this freestanding wall becomes a source for lighting for two areas.



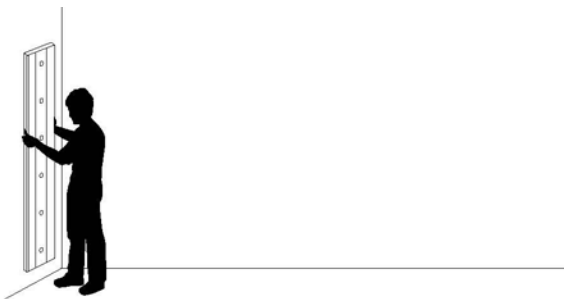
Figure 66 Examples of the Paper Softwall (Molo Studio Ltd. 2008)

This unique texture fabric can be adjusted for large spaces or compress into a small object to be stowed away at ease. This free standing partition is quite flexible able to bend and turn small distances. What makes this product so unique is that it comes in multiple heights ranging from one foot up to 10 feet high and could be combined to form various size pieces. Molo studios can provide mounting devices for combining various pieces such as: a one-foot high white wall with lighting can be mounted to a three-foot high black wall. Also, it is light weight, acoustic friendly, easy to move and set up.



Lift softwall off wall hook and with two people, hold softwall upright, having each person on opposite sides, supporting the weight of softwall by the circular holes. For walls over 2m (6') tall please see pages 11-12.

While continuing to hold opposing end panels by the circular holes, pull softwall open by slightly lifting the ends off the floor (to reduce friction) and then slowly moving away from one another until the wall is pulled open to about 3m (10').



Store your softwall in a clean, dry environment. A compressed softblock may be stored horizontally or vertically like a book on a shelf. softwalls can be stored on the stainless steel wall hooks provided. We highly recommend hanging your softwalls during floor cleaning to keep the bottom of softwalls looking their best.



Figure 67 Instructions for setting and packing the Softwall (Molo Studio Ltd. Autumn/Winter 2009)

This fabric could be anchored down by using a custom design steel base and dowel or to the wall's face by use of steel anchor strips. Although the wall is highly used as a freestanding device; multiple small height Softwalls could be combined to form pocket windows or row of lights. As shown in figure 68, Molo Studio created the Softblock base on the Softwall consisting of shorter height free standing walls (length is also shorter) combine by use of peg and disc connectors. This instrument supports the two materials similar to the base anchor. Except, this device can be used as a small table top or tray and has a diameter of 16 inches. Figures 68 and 69 represent the flexibility of the Paper Softwall.

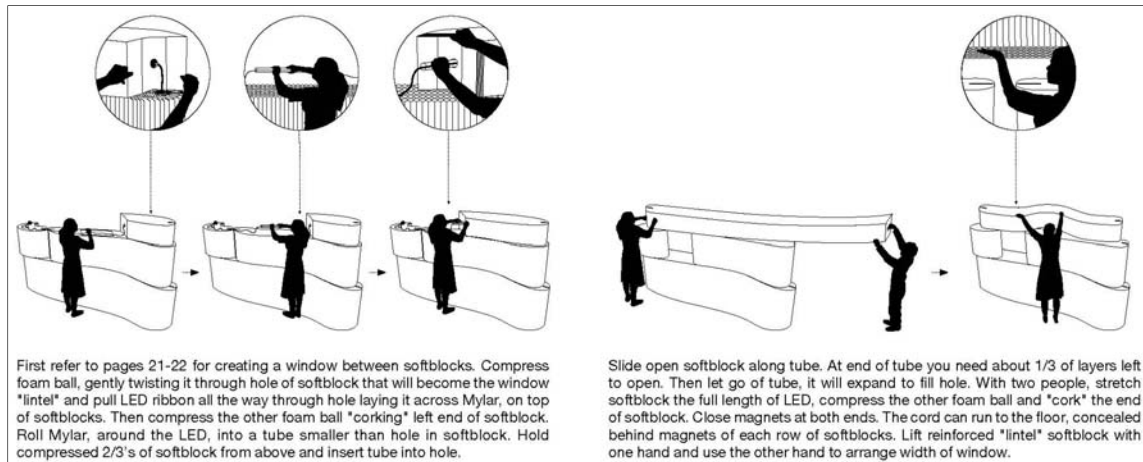


Figure 68 Softwall design with window and LED Lighting (Molo Studio Ltd. Autumn/Winter 2009)

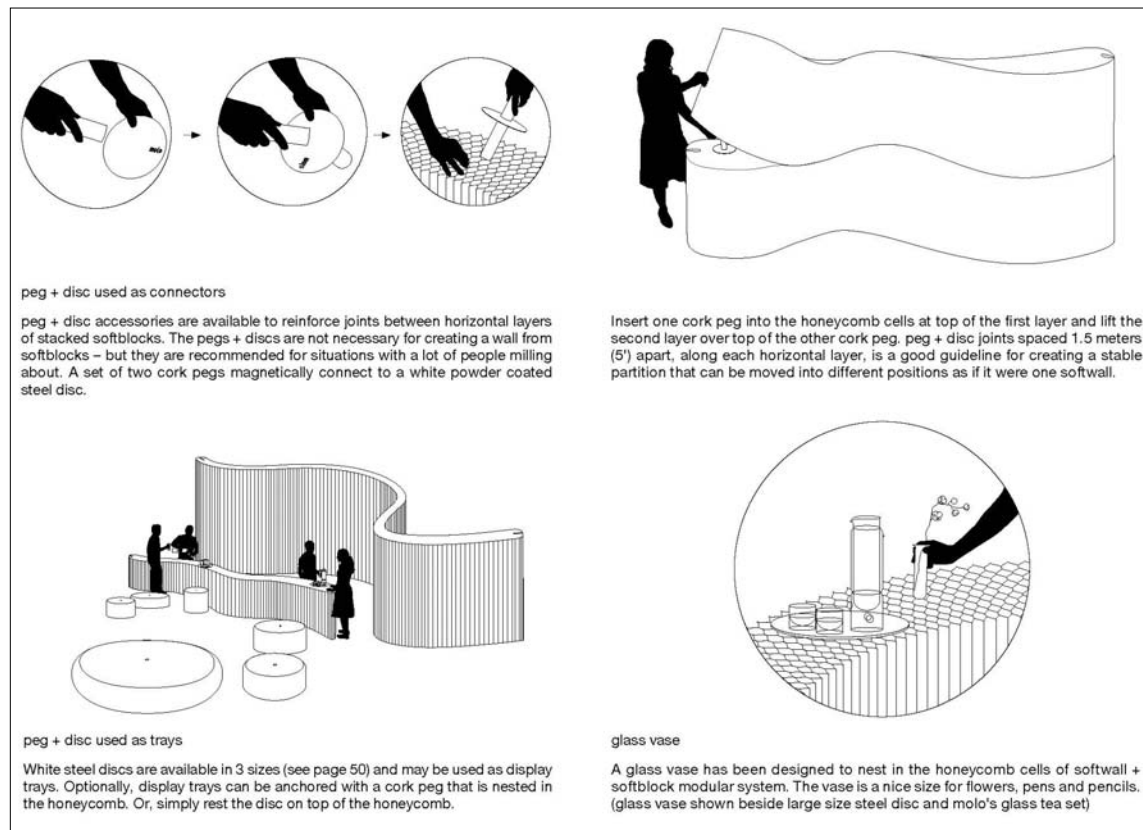


Figure 69 Modular Softwall + Softblock Accessories (Molo Studio Ltd. Autumn/Winter 2009)

The case studies above demonstrate an underlining purpose. This purpose is represented through specific ideas and inventions that point to incorporating multi-functionality in offices result in better work environments. These case studies were examined as some of the unique and innovative approaches clients, designers and architects are choosing to look at and find a solution for. They found increased developments in combining functions within a singular space. In conventional offices,

furniture had one task, specifically for the type of work they were intended for. In today's society, employees unintentionally do various activities within the same space they have acquired. Commonly used spaces such as the conference room are used for other unintended functions. As we analyze this information, the case studies used in this thesis were chosen to show that incorporating items of multi-functional value will improve the space you are using it for. Figures 70 through 73 show how other furniture designs have the potential to be multi-functional. There are all limited in information, but unique.

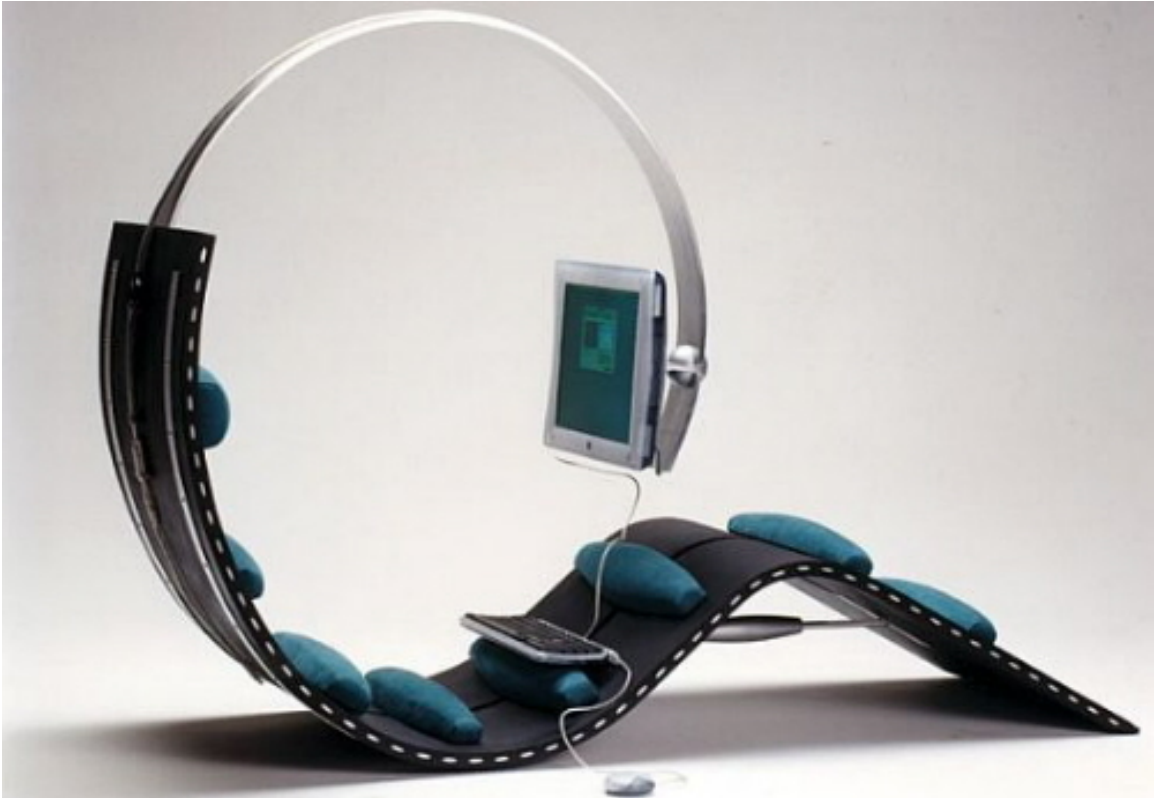


Figure 70 Surf Chair, designer Leif Sorensen, who won the Scandinavian Furniture Fair 2000 for Best Product Award (Lylover | design 2009)

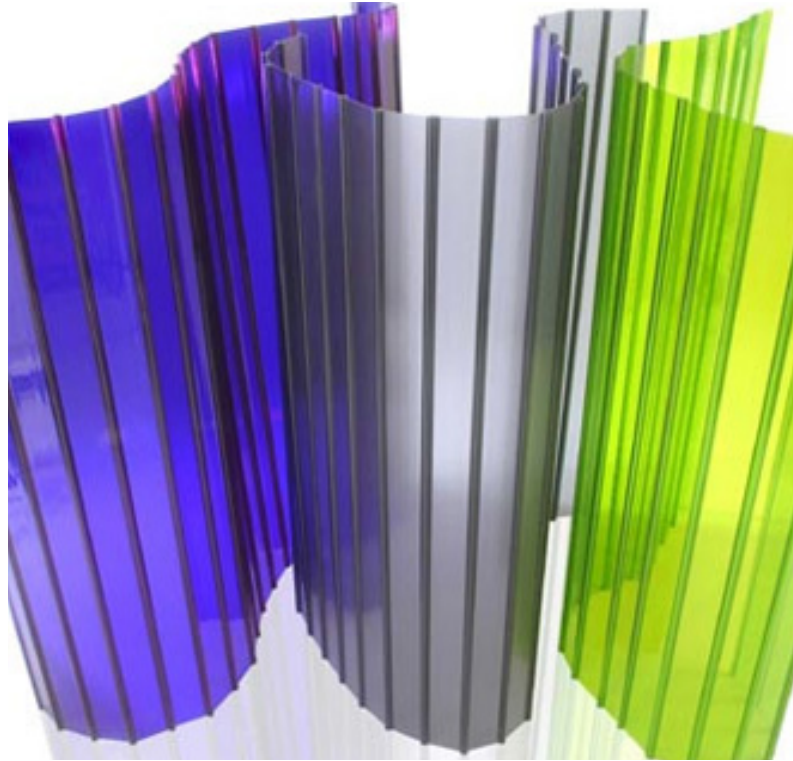


Figure 71 Extendable Screen design by Tom Dixon (Bonluxat 2010)

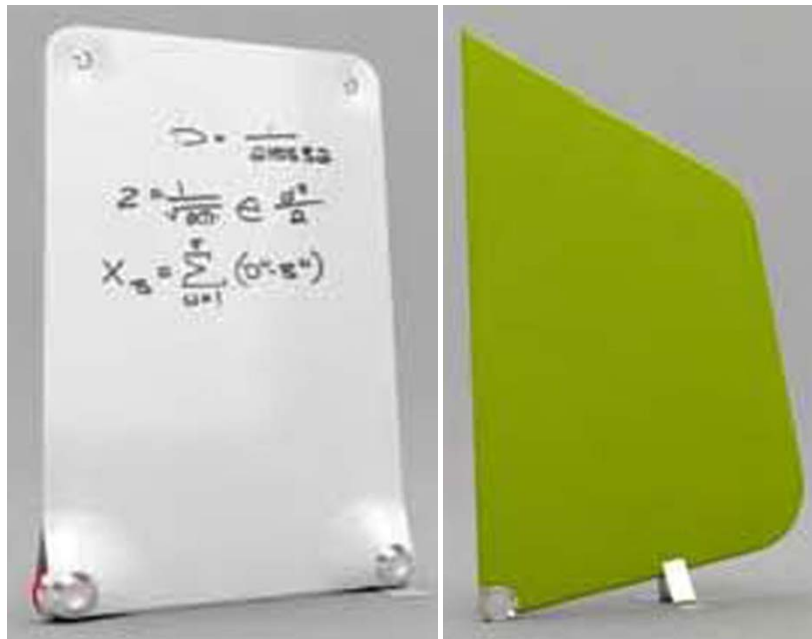


Figure 72 Mobile Screens by Leef (Leef n.d.)

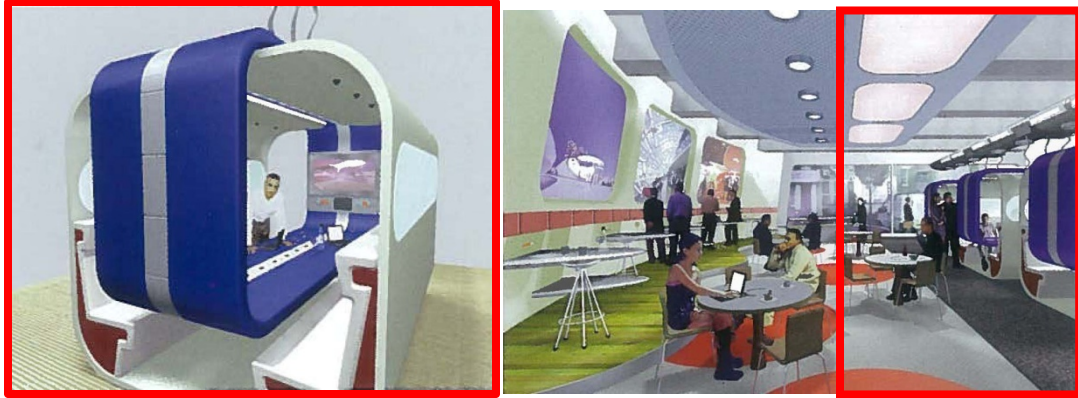


Figure 73 'Neighborhood Work Club' by
Richard Hywel Evans Architecture and Design Ltd (Myerson and Ross 2003, 15)

The furniture table shown next, summarizes the multi-functional furniture in relationship to the task and function each item produces. It is a chart showing all the flexible office furniture mentioned above in comparison to each other. It also provides a general statement regarding suggested use to office work mode(s) it is most suited for.

The intention for showing these flexible furniture is to convey how they could be used in the multi-functional office settings. As mentioned earlier, these spaces hold one primary function that serves as an unintentional multi-purpose work space. These unintentional tasks done in this room were not intended for this purpose. We want to correct this by creating a multi-functional space that serves several or multiple activities related to that work function. The flexible furniture described in this chapter demonstrates how such furniture could be used for other purposes, without losing the productivity of the employee using them. The employee can intentionally use the flexible furniture to the task it was intended for.

Table 1 of 4

<u>Case Studies</u>	St@ndby Office (Hadi Teherani AG 2009)	Four Works (Four Design 2009)
Designer	Hadi Teherani	Four Design
Dimensions	146 (w) x 74 (d) x 190 (h) cm	n/a
Material/Equipment Option	Steel/Aluminum/Wood Workstation	Black and White
Environment	Drop Ins, Satellite Office, Third Place, Virtual Office, Non-Territorial Office	Drop Ins, Satellite Office, Third Place, Virtual Office, Non-Territorial Office
Office Mobility	Workstation on rollers Enclosed and Open Workstation Portable System Furniture	Rollers or no rollers; optional
Suggested User	Mobile and Temporary Employees, Consultants and Clients	Mobile and Temporary Employees, Consultants and Clients
Work Mode	Focus Work	Focus and Social Work
Flexibility and Function	Integrated Cable and Electrical Leads Workplace Task Lighting Height Adjustable Working Table	Integrated Cable and Electrical Leads Flexible Task Lighting Swivel laptop table Shelving units
Suggested Usage	Desk Sharing, Free Address, Hoteling, Hot Desking, Touchdown Spaces	Desk Sharing, Free Address, Hoteling, Hot Desking, Touchdown Spaces

Table 2 of 4

<u>Case Studies</u>	Bungee Table	CityHall
	(Global Upholstery Co. Inc. 2009)	(Krumnikl Environment n.d.)
Designer	Global Total Office Manufacture	Krumniki Environment
Dimensions	28 (l) x 60 (w) in	245 (w) x 45 (d) x 90 (h) cm
Material/Equipment Option	Leg option: Tapered or Spider Table option: 2 wood grain colors	Walnut and Birch
Environment	Conference/Meeting, Lectures/Seminar and Communal/Informal Rooms	Multi-Functional Office Environment
Office Mobility	Leg Options: With/Without rollers Light and Moveable to any location	n/a
Suggested User	All types of people	n/a
Work Mode	Collaborative and Learning Work	Various work
Flexibility and Function	Adjustable to activity condense and store folded tables Bungee cord connection attaches to other Bungee tables	rotating pivot point on upper and lower face of internal storage units-- rotates 360 degrees accessing units from front and back face adjustable shelving units tabletop
Suggested Usage	Drop-Ins, Free Address, Group Address, Touchdown Spaces	Informal and collaborative meeting areas

Table 3 of 4

Case Studies	Silver Chair (Hadi Teherani AG 2009)	Growing Family Kitchen (Interior Design Inc. 2007-2009)
Designer	Hadi Teherani	Marcello Zuffo
Dimensions	n/a	n/a
Material/Equipment Option	Back rest option roller option	n/a
Environment	Multi-Function Office Environment	Lounge or Dining Areas, Lunchrooms, Mess Halls and other socially implied spaces of gathering
Office Mobility	Leg Options: With/Without rollers	Fix to a singular point: main body is able to rotate 360 degrees
Suggested User	All types of people	All types of people
Work Mode	Various work	Collaborative and Social Work
Flexibility and Function	back rest is adjustable flexible sitting heights	rotating pivot point housing conduits and mechanical parts kitchen appliances are replaceable
Suggested Usage	chair is adjustable to task and function	Kitchenette

Table 4 of 4

Case Studies	Traxx and Tiles (Kimball Office 2010)	Paper Softwall (Molo Studio Ltd. 2008)
Designer	Kimball Offices	Molo Studio
Dimensions	3'-6" (h)	50'-0" span; 8" (thk)
Material/Equipment Option	mounting board and tiles	Black, white material LED lighting option
Environment	Multi-Functional Office Environment	Interior office use only
Office Mobility	n/a	free standing lightweight able to compact into small compartments
Suggested User	n/a	n/a
Work Mode	Focus, Collaborative and Learning Work	Collaborative, Learning and Social Work
Flexibility and Function	Interchangeable panels with acoustic panels, tack board, flex board, marker board and hanging racks system furniture attachment	free forming walls multiple heights with optional LED lighting system visual barrier; translucent
Suggested Usage	Wall System	Space divider

Conclusion

“Innovation measures jumped 15% when a design firm created a workplace that encouraged and supported brainstorming, peer critiques, and the free exchange of ideas.” (Steelcase 2009).

A key factor in innovation is to understand how previous clients have encouraged new ideas to increase employee satisfaction and workplace flexibility. From peers to clients, statistics state better designed offices increase productivity and job satisfaction among users in the workplace. The case studies in this chapter demonstrate how improving the work environment with multi-functional spaces has a greater impact on employees, who work in the office daily.

This conclusion is based on evidence researched in the previous chapters. Where history and the progression of socio-economical trends forced us to reinterpret how the office meets the needs of the people working in the workplace. Through pre- and post-surveys taken in the WPI, we find that employees and clients think differently, so the office floor plan has to be adjusted to these concerns. In that regard, successful offices using the WPI will increase the productivity and efficiency in the employee. The case studies reinforce the intention of the WPI in producing results in current workplaces. The case studies show that designing an office around the employee will help improve how offices are used. The next step is to look at the process of creating multi-functional spaces and how it improves employee satisfaction in the workplace.

The goal is to solidify a conclusion based on actual case studies that have discovered the practicality of multi-functionality. This will lead to new ideals and new approaches that have otherwise gone untested.

The next chapter, the Multi-Functional Office will conclude suggestions on improving the use of space through time utilization. It will be through ‘Time Utilization’ and ‘New Ways of Thinking’ that will express reasons why multi-functional offices will meet and improve conditions in the 21st century office.

Chapter 4

New Design Solution for 21st Century Offices

Multi-Functional Spaces

In the past, the office was the permanent 'home base' for individuals to work and interact. Now, the term 'home base' refers to the primary office where mobile employees begin and end their travel. The 'home base' is represented as the main quarters that the mobile employee returns to at the end of each journey away from his/her workspace. In such cases, the office environment becomes an intense space for high interaction and a brief individual work concentration specific to the mobile employee.

Generally speaking, "an even bigger underlying change may also be prodding companies to rethink their office spaces: *'Offices are no longer seen as simply a liability,'* says Frank Pettinati, regional discipline leader in the Chicago office of national design firm Perkins+Will. *'Offices now are emerging as key branding tools'.*" (McGarvey 2008).

Workplaces in the past were based on a single concept that was represented in a hierarchy system of management called 'Taylorism'. At the time, this concept was represented in every office across the world. Through research analyzed by architectural and furniture companies, starting in the 1990's, found that companies do *better* when their employees work in a comfortable atmosphere that is well designed to their task or project work. The workplace is gradually converting into a branding tool that is distinct and unique to each company's office culture and philosophy. Current trends indicate that offices with better designed workspaces incorporating company culture and philosophy have made new developments in improved spaces that earlier managerial concepts did not represent. Although branding is a separate topic, this trend in incorporating the underlying ideas of branding into the design, has gradually become the focus in office design layouts. 'One size definitely does not fit all.' This concept emphasizes, as in the case studies in the previous chapter show, all the different design ideas and approaches each company analyzed while incorporating multi-functional spaces represented by their own office culture and philosophy.

As we move towards the end of the first decade of the 21st century, we clearly understand the uniqueness of office design today compared to 30 years ago. Through trends and technology, the office has produced tools for encouraging communication and work flexibility among employees. It produced new problems and challenges for the workplace that we need to adapt to; we need to change. People don't just travel to work; they also frequent job sites and other locations for consultants and clients or visit

other companies. As a result, companies have to make adjustments to the workplace to accommodate these changes.

Utilizing and Combining through Timesharing

When people think of time-share, they think of property ownership or real estate. Time-share is used to describe yearly ownership of a property. Typically time-share is associated with popular resorts and condominium units, where multiple people can own a particular property for a certain time period at any given time of the year.

In comparison, office buildings have a higher overhead, yet surveys on time utilization, regularly show that offices are rarely occupied all day. Employees are away from their desks when visiting clients, consulting colleagues, attending meetings, working at home, looking up information, on holiday and/or sick leave. Some surveys explain that workstations and offices are unoccupied for as much as two-thirds of a typical work week. These unused areas throughout the day are inefficient and considered wasted space. Either way, the point of this study is to show how improvements to empty workstations can increase the productivity of the firm.

The initial intent of the Multi-Functional Office is to create spaces within the office that are flexible to different settings, depending on work task or function through time-sharing. In this case, time-sharing would be applied through the use of scheduling specific events and/or functions throughout the week, month and/or year. Employees could adjust the space depending on function when it's necessary. Afterward the work area could be rearranged to a new function or reverted to its original setting.

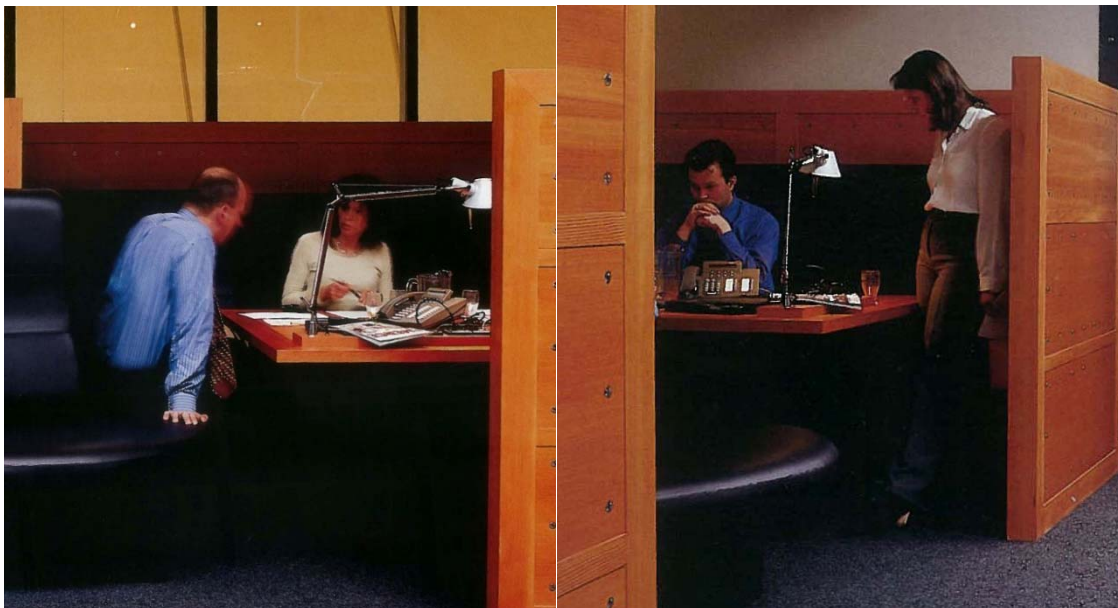


Figure 74 McKinsey & Company 'Lounge Tables' (Myerson and Ross 2003, 87-88)

This 'purpose-design' lounge table (Myerson and Ross 2003, 86) created for McKinsey & Company is an ideal example to illustrate how time-sharing would be applied. These

lounge table set ups around the firm are multi-functional spaces that create several types of task work involving individual and/or group sharing activities. At any given time, employees would use it for informal meetings, individual work and/or client/consultant meetings. Employees would schedule appointments ahead of time so that co-workers will be able to efficiently use the space at any time not appointed by a reservation. Multi-Functional spaces shown in figure 74 by McKinsey & Company can be used for multiple task work; it is suggested to arrange some form of appointment or scheduling of time in reserving the multi-functional space. Time-sharing of Multi-Functional areas will increase the utilization of space throughout the day more efficiently, while the cost of this space is not wasted.

Although offices have different uses for these spaces; each office would vary in design and multi-purpose functionality. The multi-functional space(s) would serve as a room for different activities in which would be active on specific occasions or adjusted per date and time.

The office would use these spaces as a dedicated area for various types of work tasks, assignments and/or project groups. Through the use of time-sharing, the space could be adjusted, reconfigured and/or interchangeable with other office furniture and equipment systems for the next activity. For example, the conference room is able to reconfigure into a classroom then rearrange into two informal groups of tables for employee discussion. The reserved room is able to configure to each of these activities without confusion due to organization of time.

New Ways of Thinking

As mentioned in Chapter Two, 'Analyzing the Workplace,' the following steps are suggested in order to create the best office environment for the client before proceeding to the appropriate space planning for office design.

Suggested Steps for New Office Design

This section examines the design process leading up to the developments and benefits of space planning in the Multi-Functional Office. This process is to look at steps prior to the start of the project's schematic design. These items are suggestions in improving current offices to improve success in new design offices.

Design Steps to the Start of the Project Phase

1. At the start of the project, it is suggested to get permission to distribute a Workplace Index survey to your client's employees.
2. After the pre-survey is gathered, the information analyzed will help the client's company realize the conflicts and issues in their current office. In addition the survey provides you with insight on how the new office design

should not include. The next step will be to officially start the Workplace Envisioning Session with your client(s). This will increase the success of the office being design. By examining what clients want and what employees have commented on in the survey. The new office can identify future problems and make changes in correcting those issues. Workplace Envisioning Session will take a few sessions in order to develop the goal that is best for the company's needs.

3. Within the Work Envisioning Sessions, the WPI survey should incorporate the WPI formula. Referring back to Chapter 2, the Workplace equation (shown in figure 75) explains that the current workplace trend is insufficient in satisfying functional spaces for all employees. This equation would be used to improve the design approach to the office layout while looking at space effectiveness and time spent in the different work modes. The WPI equation demonstrates that employees and clients use spaces differently than perceived and suggests improvements in creating a better office environment.



Figure 75 the Workplace Index (WPI) formula representing the Ideal Office (Gensler 2008)

4. Within the WPI survey is the Time Utilization Study which analyzes the current workplace and executes a study that will help improve how spaces are used in relationship to occupancy and the amount of traffic each space acquires throughout the year. This study will help determine how new offices can be design and what spaces make sense in combining functions for better efficiency. The WPI equation includes the variable 'time spent' as a solution for improving productivity among employees.

5. After the Work Envisioning Sessions, this would be the start to the project's schematic design proposal in creating design layout that satisfies the client's expectations and employee satisfaction to work environment.
6. The last step would start one to three years after project completion. A post-WPI survey should be taken to verify how the space was used and the results of your design scheme. This will determine if employees are satisfied in the workplace and if the company has seen improvements in profits and project success.

[Steelcase developed a similar approach to the WPI's survey. They identify four levels of change required for organizations to improve new office facilities. These levels of change are 'As Is,' 'Refine,' 'Rethink' and 'Emerge' is considered the process to successfully design an office. 'As Is' starts at the existing square footage and examines how reduction in current spaces can lead to better facilities. They would define the unused spaces and subtract them to find how much efficient space is used. 'Refine' level of change takes a look at specific spaces around the office. Then, examining current workspace by adjusting and tweaking them will reduce the "real estate cost by 10-20 percent." (Steelcase 2009, 5). 'Rethink' refers to the company's work process and office culture. This level of ability "recognizes the types of work and tasks people actually do." (Steelcase 2009, 6). In addition it determines the work strategies and ratio of individual to collaborative spaces recommended in the new office environment. 'Emerging' the current workplace with improve new office designs create a new discovery in better design offices. From meetings with clients to evaluating employees, the new office would take into account three dimensions of design possibilities. This concept by Steelcase is to create a better design workspace that is base on the same principals as WPI's formula. Ideally, the process before going into schematic design is crucial and both company's workplace research emphasizes on steps taken during the conceptual design stage.]

Improving efficiency in Schematic Design

During the early stages of the schematic design phase a research survey done by Knoll suggests to look at workspace integration. Workspace Integration is the model Knoll, Inc. created to produce a dynamic work flow between work modes and workspaces. Knoll produced three work modes based on the concepts Gensler, HOK and DEGW created before. When combined with workspaces, refer to the flow of people and work that is integrated into a set of patterns. "The model suggests that better the quality of workspace integration, the better the work performance of employees." (O'Neill and Wymer 2009, 4). As such the model workspace integration is defined through two types of organization performance, the horizontal and the vertical.

The first type "Horizontal Workspace Integration" is defined as, "the ease of information and people flow between 'work modes' that occur at different physical locations within

a facility.” (O’Neill and Wymer, Topic Brief 2009, 2). The physical space where work modes intersect each other – people are able to move from one single functional space to another for different work assignments. An example would be the individual workstation and the conference room. They are two single functional spaces next to each other use for different task. Therefore horizontal integration is made up of multiple single functional spaces join on a single floor.

Meanwhile, “Vertical Workspace Integration” is defined as, “the ease of individuals being able to shift from one work mode to another (such as focus to share activities) *within their primary workspace.*” (O’Neill and Wymer 2009, 6). This definition implies that a single space is flexible and multi-functional to various work activities, in order to improve the quality of the person(s) working in the space. See figure 76 for characteristics and benefits of horizontal and vertical integration patterns.

Horizontal Integration	
<p>Characteristics</p> <ul style="list-style-type: none"> + Changing locations to change work modes is conventional + For most organizations, horizontal shifts occur between all work modes 	<p>Benefits</p> <ul style="list-style-type: none"> + Accidental and unplanned sharing of ideas + Movement encourages unplanned conversations between different individuals and teams + Reduces risk of injury + Moving throughout the day provides enhanced circulation and can reduce the risk of musculoskeletal injuries due to static postures
Vertical Integration	
<p>Characteristics</p> <ul style="list-style-type: none"> + The ability to shift between work modes in one location perceived to be innovative + Few facilities are designed to support work flow between all modes, most shifts occur between Focus and Share 	<p>Benefits</p> <ul style="list-style-type: none"> + Efficient use of space Use less square footage + Efficient use of time Shifting between work modes in one location reduces travel time + Cross fertilization of ideas Spatial proximity of employees for easier interaction

Figure 76 the Characteristics and benefits of Horizontal and Vertical Integration (O’Neill and Wymer 2009)

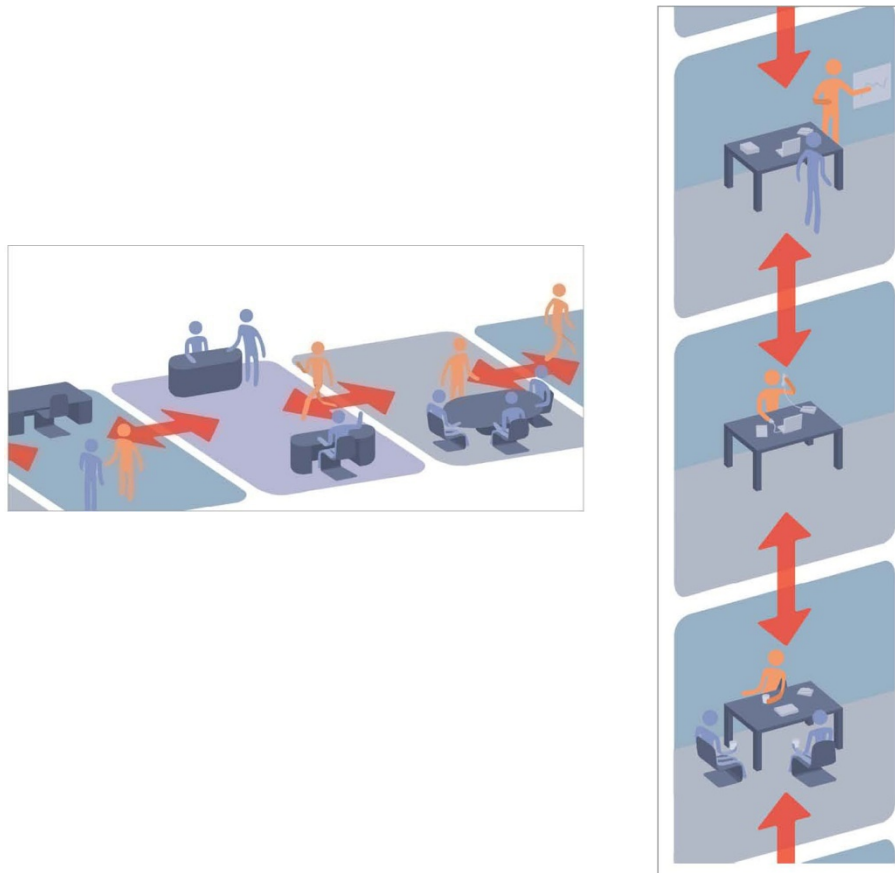


Figure 77 the (Left) Horizontal Integration and (Right) Vertical Integration (O'Neill and Wymer 2009, 2)

Figure 77 visually demonstrates how integration of space planning is demonstrated. Horizontal integration is design for horizontal circulation through various spaces. Vertical integration means that a single space can be adjusted or rearranged to a specific setting.

When applying the two workspace integration types, Knoll research found that industries vary in proportion to horizontal and vertical integration. Shown in figure 78 is the relative proportion of integration across eight types of industries.

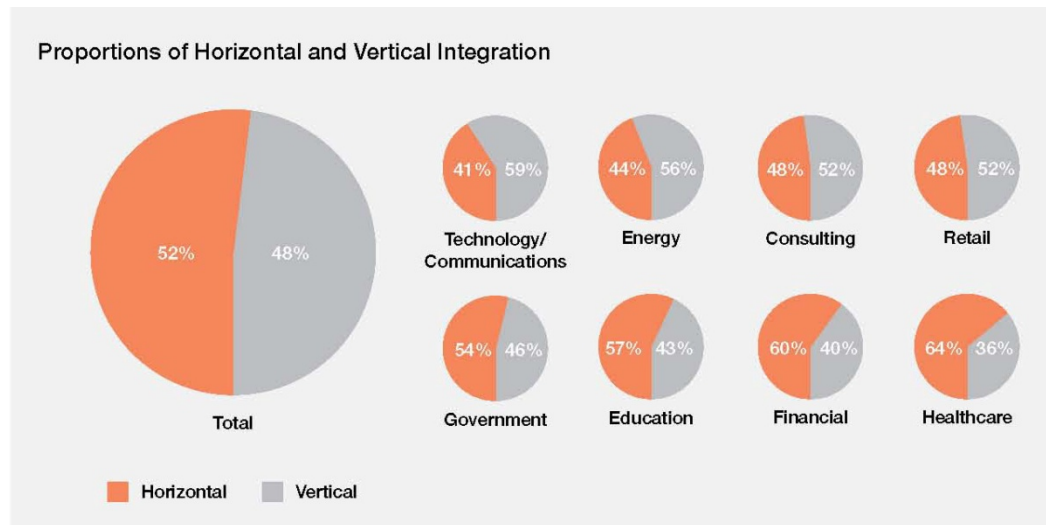


Figure 78 Relative Proportion of Horizontal and Vertical Integration across Eight Office Industries (O'Neill and Wymer 2009)

Be aware that the eight industries shown in figure 78 are not specific to the office workplace. The chart shows the percentages of horizontal and vertical integration among eight common industries with a total average across all industries. Of industries shown above, four of the eight industries have higher use of vertical integration. Therefore, the increase in multi-functional furniture applied to these vertical integrated spaces will increase the utilization of time spent in that space more efficiently. As displayed in figure 76 and 77, the benefits in shifting furniture to create a different space layout for assignment(s) or project(s) can increase employee productivity.

The pie charts above, display the different industries categorized into eight types of work with an overall diagram indicating the average among all eight industries. However, "there are a variety of reasons for these differences, largely driven by the nature of the layout of space and the predominant type of work performed by industry. For example healthcare facilities have almost doubled the amount of horizontal work flow compared to vertical work flow because these facilities tend to have a large footprint and frequently are spread out over several buildings on a campus setting." (O'Neill and Wymer 2009, 10). Some of the industries survey non-office environments in addition to known businesses in the office setting. As a result, only four of the eight have more than 50 percent increase in the use of vertical integration. In today's economy, current trends are increasing the number of multi-functional spaces be used unintentionally people work less productive. As a result, applying new multi-functional spaces to correct the functional use implies employee effectiveness to adjust spaces to the arrangement they require.

Through case studies, observation and the research studies uncovered, Knoll created some design recommendations to confirm how to provide design insights for horizontal and vertical work integrations. The list shows the recommendations on horizontal and vertical integrations suggesting improvements to space planning. They were directly

taken from “Design for Integrated Work by Knoll Workplace Research.” (O’Neill and Wymer 2009).

Horizontal Integration

Enhance office layout for ease of accessibility of co-workers

- Optimize layout and location of workstations and offices to enhance visual access. The line of sight from person to person becomes key in connecting the individual to the group. This visual connectivity reminds individuals there are others around them and people monitor their behavior.
- Reduce overall horizon height of the walls and furnishings to increase visual access and accessibility. This is not to say that a single horizon is the right solution. Instead, provide the balance of horizons to support the work at hand: low horizons support collaboration and mid-height panels assist focused work. Maintaining direct lines of sight to the window line are important as well.
- Create a variety of work activity zones to enhance chance encounters. Providing a variety of settings to support a variety of work is a cornerstone of dynamic planning. Understand your work processes and provide appropriate settings to mirror the work flow. The rhythm of the workplace should match the work.

Support smooth transition between work modes

- Create collaboration spaces of varying sizes. This tiered approach to meeting spaces should meet the varying needs of the engagements—formal to casual. Time is a critical planning criterion for these areas. A short meeting may only need a standing solution; more intensive sessions require space in which people can hunker down for longer periods of time.
- Ensure that policies and technologies make it easy to assign collaborative and unassigned individual spaces as needed. The “culture of permission” is influential in the workplace. Are people allowed to use the resources and spaces provided? Is there a perception that resources are readily available and plentiful? Does the culture embrace the idea that work can occur anywhere, anytime?
- Provide good quality administrative support that smoothes transition to work at different facilities. Specifically for a very mobile workforce, a concierge approach keeps things clear: where to sit, where to print, where to find coffee, and how to connect.

Vertical Integration

Optimize arrangement of furnishings and technology in workspace

- After observing the range of tasks and interactions occurring within the workstation, ensure the technology and work tools are arranged in a way that supports the flow of work tasks. If the flow of tasks makes it impossible to design an interior layout that supports all work, design so the furnishings and technology can be adjusted or moved by the employee.
- Primary workspace should permit quick, informal meetings (nimble visitor seating, collaborative work surfaces, marker boards, etc). The ability to scale is important. Having a second or third person accommodated in the primary workspace allows for the exchange of ideas and information in a fluid manner.
- Ensure technology devices and furnishings are arranged to support collaboration. An adjustable monitor arm allows for more than one person to view the flat screen display, or wireless input devices make it easy for others to take command of the mouse and drive. Keep a strong group connection to technology.
- Specify furnishings and technology that can be adjusted or moved by the worker. Personalization of the primary workspace by micro adjustments—work surface, chair, storage elements, and monitor—allows the user to modify the space to suit his or her needs. This also fulfills the occupant’s desire to shape their own space.
- Workspace design should help the employee make a smooth transition between individual work and different types of interactions. The primary workspace should permit the associate to have quick, informal meetings within their workspace (perhaps through flexible visitor seating that permits “perching,” collaborative work surfaces, etc.).

Design Flexibility in Vertical Integration

“The key to creating that sense of order is what Siebert and others at Steelcase call ‘fluidity’— the ability to support the residents’ constantly shifting priorities. ‘If we don’t start by designing around processes and people, we never catch up. Adapting design and products to allow teams and individuals to adapt the workplace for their needs is a better direction than hoping you can anticipate what and how they may work,’ he says. “We think that user-adaptive design will allow companies to minimize risk in planning.” (Steelcase 2006, 3).

The Steelcase’s observation above explains how adapting design flexibility for employee needs will better meet the company’s needs than anticipating how people would use single functional workspaces. Flexible furniture placed in a space will better serve the needs of the company than designing fixed furniture for that same space for the primary activity and predicting the other ways they would use it. The list below responds to the fluidity workspaces should have. They are within reason that similar functions would work in the same space than combine two or more work modes together, which might not be a good idea. The list was referenced and modified from Steelcase’s 360 Deep

Dive article called, “The State of the Cubicle: What’s Now and What’s Next 2006.” (Steelcase 2006).

Adaptability for *individuals*: A range of work tools and storage solutions that meet the needs of most people and then further adapting for individuals who might have needs beyond the ‘standards’.

Adaptability for collaborative work modes:

For the *teams*: Steelcase researchers use the term “huddling around content” to convey the idea that teams typically meet for very specific purposes and may need access to tools (large computer monitors, whiteboards, etc.) that allow them to share content as a group.

For the “*twos and threes*”: The largest percentage of interaction happens in groups of only two or three persons. Does the layout encourage interaction among individuals or groups of people?

For learning work mode: Allow for range of work tools and furniture for large interactions, discussions, teachings and other groups of knowledge base learning.

Adaptability for social spaces: An informal environment use for various types of socializing within the company where furniture is adjustable to movement in space. Does the layout also encourage technology such as networking and other conduit capabilities, while creating an informal socializing space?

Additional flexibility to Multi-Functional spaces to be kept in mind is provided below:

- “Measure the benefits, not only in economic terms but also by their social and environmental impact on the company and its constituencies.” (Steelcase 2009, 6).
- Selecting the right office base on square footage of floor area to number of occupants within it. “The Steelcase/CoreNet study reports most organizations allocate 200-225 square feet of net usable space per employee.” (Steelcase 2009, 5). That number per person is the amount of space an average American employee uses in the office. (Please determine this average to the number of employee over square footage of current offices in comparison to each other.) This should take into account expected downsizing and company growth as increasing density in the workplace becomes one of the key reasons for reducing property cost.
- Integration of drop ceilings and raise flooring improves the usable floor area. By incorporating electrical, cable conduits and floor outlets, as well as mechanical systems for better ventilation and air flow. Raise flooring creates a unified surface without objections or extrusions to space planning. This helps to improve the amount of wasted space not used in the office. Combine with drop ceilings create

better use of mechanical and lighting systems that help improve employee comfort in the office.

- “Different people and teams need different technology at different times. Therefore flexible and easy access to data and power outlets should be implemented. In addition office furniture providing pre-fabricated installed conduits is suggested.” (Steelcase 2006, 3).
- “Technology and digital access is absolutely necessary at the primary workplace; primary locations need high-quality workspaces for collaboration and virtual conferencing capabilities. Facilities operators should seek priority agreements with service providers for services at other locations.” (Venezia 2007, 6).
- “Keep the space flexible so it can adapt to the constantly changing requirements.” (Steelcase 2009, 6).
- “Enable mobile workers to work where and when they like, at any hour or day of the year. *Manage people by objectives rather than by their presence.*” (Venezia 2007, 6). *Multi-Functional spaces could be dedicated by teams or projects for various usages.*
- “Allow for mobility of work, not only the mobility of people. *Workplaces must be highly portable, with necessary technology, equipment and support tools.*” (Venezia 2007, 6).
- All furniture and objects within the Multi-Functional space should have access to multiple functions relevant to the theme of that functional space including task or work primary used by one person, two people and/or a group of people.

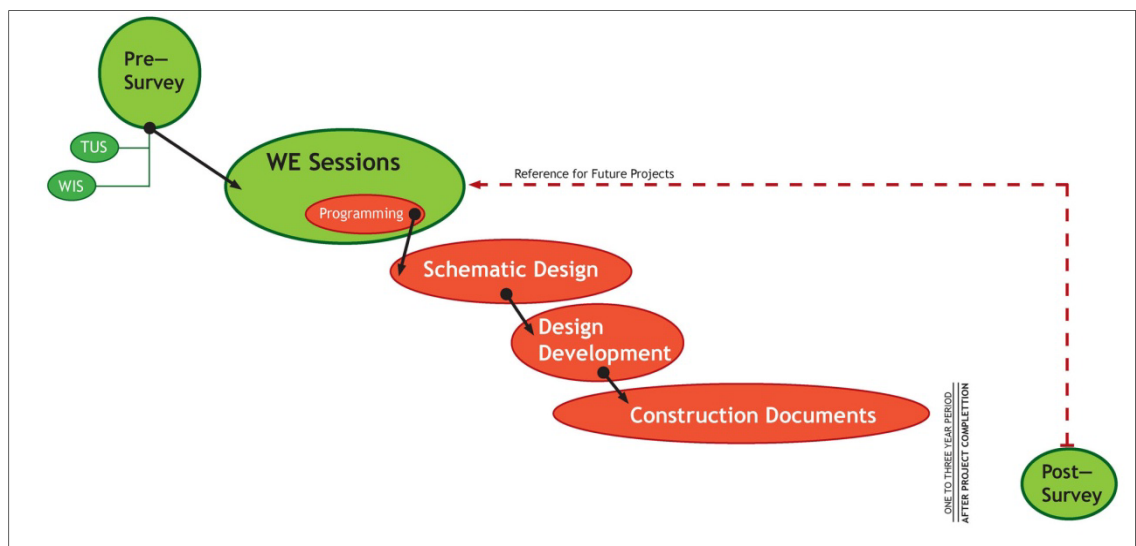


Figure 79 Design Process- ‘New Office’ Approach (Ryan Yee)

Base on the written steps in this chapter, the following design model shown in figure 79 displays the ideal ‘New Office’ Approach modified for the 21st century offices.

Final Thoughts

'One size does not fit all.' This famous phrase represents an intangible aspect of the Multi-Functional Office. We cannot design an office with the intention of combining all functional needs into one space. Rather, the Multi-Functional office is defined through several spaces that perform various tasks related to a particular work mode. Not every business will fit into the model of using multi-functional design and planning into existing or new offices during the design process. Carefully review if this would benefit the client and employees working there. Every office is different, but new socio-economical trends and developments have encouraged new ways of thinking. As a result, the Multi-Functional Office can be used to discover improvements in existing offices in order to create a more successful one.

Briefly, "Whether the final decision is relocation or renovation, incorporating modularity, sustainability and technology into the design of the space works financially and strategically. Less hierarchical, more open layouts with adjustable, interchangeable furniture configurations provide a sense of community and promote idea sharing amongst employees, while also allowing a company to accommodate expanding and contracting workforces with minimal cost, little waste and only minor disruption to operations." (Business Wire 2008). The goal is simple to create an alternative solution for the 21st century that will improve the use of space in order to produce workplace satisfaction.

Conclusion

“It’s gradual and imperceptible by day, but over the last decade has amounted to a tectonic shift in the professional services business. Clients are more discerning. Corporate real estate footprints are shrinking. Workers are more mobile and change employers more frequently. Information is ubiquitous and overwhelming.” (Steelcase 2009).

The future is uncertain therefore the design of the workplace must remain flexible to adjust to this uncertainty. We presume that significant change comes from socio-economical impacts on society, which in turn, changes the outlook on current criteria that was better for the office environment.

The assumption made in this thesis is to emanate change in current offices that is gradually being considered as innovative and new. By defining the office through the four work modes, we produce better results in creating better workplace integration. As a result, we find that spaces with flexible, multi-purpose furniture used in limited spaces within a larger office helps improve efficiency of space used throughout the day. These multi-functional spaces within the office help distribute the work flow by producing undefined flexible spaces for various types of work activity. These multi-functional spaces complement the four well-defined work modes as transitional spaces of various work activity. The Multi-Functional office creates an ‘in-between’ work environment that encourages collaboration and privacy, the formal and informal, and collective and individual work habits. By placing flexible furniture into these spaces, it forces users to change the space within it, when it’s appropriate to the activity they will engage in. It develops better results in the user as the space suits that work activity. Whereas, working in spaces that don’t function to your work activity feel uncomfortable.

The Multi-Functional Office was demonstrated by three key concepts that support new office design. These three key aspects are flexibility, social implied spaces and mobility. The three concepts demonstrate improvements to new office design that produces employee satisfaction and better work efficiency.

These concepts are represented in the case studies establish the Multi-Functional Office are summarized below:

- 1) Flexibility in office furniture produces different results in the person(s) using them. Therefore, flexibility in the ways that the furniture is used encourages new functions for the same space. It encourages varied work activities that would be beneficial to offices with limited or unusual square footage.
- 2) Socially implied spaces are multi-functional. The employees surveyed stated that the better workplaces incorporated informal, community based spaces. This space encourages interaction between employees, consultants and clients

creating an appropriate environment that is different from work. As mentioned earlier, social spaces retain and bring in new employees while increasing the popularity of working in this office setting.

3) Mobility is a term that is increasingly used to describe 21st century offices with a high use of mobile employees. “By the year 2011 the number of mobile employees are suppose to increase to nearly 75 percent of the U.S. workforce, roughly 80 percent in Japan.” (Steelcase 2009, 5). Mobility in the workplace design should be applied to current offices. Offices incorporating mobility reduces cost of fix stations and spaces as stated by Steelcase.

The multi-functional space could be used to accommodate mobile employees and consultants in order to keep fix workstations for non-mobile employees. Mobility is a trend that produced new work styles and terms, such as free address and hoteling.

As the Multi-Functional Office justifies a new outcome in office design. The underlining purpose that has progressed is acknowledged step-by-step in the following chapters below:

Chapter 1, “History of the Office,” defines the origin and evolution of the office. Through office history, types of organizational/managerial styles impact the workplace culture, work modes and layout; we learn that the office has undergone many changes by effects of socio-economical influences explained in the next section.

This section called, “The Impacts of Socio-Economical Trends on the Office,” explains how impact on past and current office trends led to new problems and issues concerning better design offices for the 21st century. The three crucial elements found were identified through change in society, global influences, and modern trends improving the capabilities of the employee. We learned that current effects on technology have produced a new type of worker that is mobile and flexible to activity and project assignments. These mobile employees have caused a shift in designing non-conventional offices.

Chapter 2, “Defining the Office through Workspace and Statistics,” are composites of multiple surveys taken by different office industries to show why new office design is important over conventional offices layouts. At the end of this chapter, we find that workplaces that redefine the office actually generate better results in the company. Well design offices are more credible than current offices.

Chapter 3, the “Case Studies” is determined by completed projects applying Multi-Functionality in the office environment and flexible/moveable furniture. Through precedent studies on completed projects and innovative office furniture, we saw how opportunity to add these solutions can or could improve

work satisfaction among employees and consultants/clients at your company. As this reflects how we work in the 21st century.

Chapter 4, “Multi-Functional Spaces,” explains how space planning is applied in the office settings. By using this step-by-step process in discovering how many and what types of spaces will be effective for your office environment. By using these components within the early stages of the new office project, employees can increase task work and productivity to assignment while increasing job satisfaction. The list of suggestions were created to provide an understanding on what to look for in an office setting, types of function they can acquire over time, and what other information relates to the Multi-Functional Office.

As a result of Chapter 4, the Multi-Functional Office produces suggestions to create flexible office designs that can be applied to all types of layouts with little restrictions. The new office type visual stimulates new and innovative ways of designing the office floor. As previously stated, the new office is a theory in improving how offices are used. It is up to the office industry and designer to understand that *conventional* office design is *not* successful in today’s office culture. Whether this theory is an idea or solution will come down to how people relate and use the space. The office needs to change and adapt to how people use the office and furniture.

In that regard, the Multi-Functional Office type is loosely base on an open-plan office; unlike Burolandschaft’s concept it does not need a special or specific managerial style. The new office type should be able to adapt to all office industries and floor plans. Whether the entire office or a portion of the office becomes multi-functional, the bottom line is that this prototype can adjust. This new office type is the most flexible design in today’s office setting; it’s only natural to explore new and creative ideas that would benefit the way we work in the 21st century.

Please make sure everything is appropriate for the client and the business for which you are designing an office. The Multi-Functional Office type is a new office design that encourages creativity in developing flexible spaces for employee in order to increase various forms of work function and workplace satisfaction.

Table of Figures Cited

Figure 1 the Corridor Office (Duffy 1992, 8)	10
Figure 2 the European Corridor Office (Duffy 1992, 8).....	11
Figure 3 the Open-Plan Office (Duffy 1992, 9).....	12
Figure 4 the Burolandschaft Office (Duffy 1992, 11)	13
Figure 5 the Herman Miller's Action Office (Worthington 1997, 29)	14
Figure 6 the Collective Office (Ryan Yee).....	16
Figure 7 the Evolution of Managerial Styles in the Office (Kuang 2009)	18
Figure 8 Dilbert Comic by Scott Adams (Adams 2006)	20
Figure 9 the Evolving Cubicle portrayed by Steelcase; (Top) 1998 and (Below) 2005 (Steelcase 2006)	21
Figure 10 a Comic Humor by Mark Parisi (Parisi 2009).....	25
Figure 11 the Office Comparison (Duffy 1997, 48)	27
Figure 12 Various Social Spaces in the GooglePlex (Yahoo! Inc. 2010)	35
Figure 13 (Left) Another.Com's Surf'n'Turf Concept and (Right) Floor Plan (Myerson and Ross 2003, 138-141).....	36
Figure 14 Living Tower by Verner Panton (Panton 2010) (Panton 2008)	37
Figure 15 the Four Work Modes Chart (Duffy 1997, 61)	42
Figure 16 (Above) Patterns of Work and (Below) Space Occupancy (Harrison, Wheeler and Whitehead 2004, 18)	44
Figure 17 Predictions of Office Trend in (Left) 1990 and (Right) 2000 (Duffy 1997, 67)	45
Figure 18 Time Utilization Study for (Left) Open Plan Offices and (Right) Enclosed Offices and (Below) Key to Graphs (Duffy 1997, 227)	46
Figure 19 WPI Formula representing the Ideal Office (Gensler 2008)	48
Figure 20 taken from the 2008 US Workplace Survey (Gensler 2008, 8)	51

Figure 21 shows Job Satisfaction (Gensler 2008, 11).....	53
Figure 22 Workplace Satisfaction chart (Gensler 2008, 11)	54
Figure 23 Very Satisfied/Satisfied with Workplace (Gensler 2008, 11)	55
Figure 24 Company Performing Growth in Three Years' Time (Gensler 2008, 25)	56
Figure 25 the Ground Floor Plan (Myerson and Ross 2003, 193).....	61
Figure 26 'Cliff Dwelling' (Myerson and Ross 2003, 195)	62
Figure 27 the Urban Neighborhood overlooking 'Central Park' and	62
Figure 28 each floor represents a different theme (clockwise) Man, Women, Family, Community	64
Figure 29 the 'Dining Table' (Myerson and Ross 2003, 172-173)	65
Figure 30 view of the Independent Office Towers (Pogade 2008, 76)	66
Figure 31 the Ground Floor Plan (Pogade 2008, 82)	67
Figure 32 the Shipping Containers were converted into a Large Discussion Room (Pogade 2008, 80 & 83).....	67
Figure 33 view of the Independent Office Towers (Pogade 2008, 78-79).....	68
Figure 34 a Computer Generated Model Isometric Floor Plan View (Myerson and Ross 2006, 50)	68
Figure 35 the All-for-One 'Kitchen Table' Concept (Myerson and Ross 2006, 51)	69
Figure 36 Views from the Staircase (Left) Lobby and (Right) Main Floor (Myerson and Ross 2006, 52) (Hill 2006).....	70
Figure 37 the Main Floor Plan (Hill 2006)	70
Figure 38 Views around the Office (Myerson and Ross 2006, 53) (MotherLondon 2010).....	71
Figure 39 'Intensive Care Area' (Myerson and Ross 2003, 143)	72
Figure 40 an Isometric Floor Plan (Myerson and Ross 2003, 146)	73
Figure 41 (Left) a Communal space and (Right) an Enclosed Space (Myerson and Ross 2003, 146-147)	74

Figure 42 Floor Plan (Myerson and Ross 2003, 88)	75
Figure 43 Cockpits or Cocoons Spaces (Myerson and Ross 2003, 87-88).....	75
Figure 44 Casual Workspaces (Myerson and Ross 2003, 89).....	76
Figure 45 Deichtorcenter designed by Bothe Richter Teherani Architectural Bureau (Pogade 2008, 46)	77
Figure 46 Used as a (Left) Cafeteria and (Right) Communications Counter (Pogade 2008, 48 & 51)	77
Figure 47 View of the Working Area (Pogade 2008, 50).....	78
Figure 48 the St@ndby Office Workstations (Pogade 2008, 46)	78
Figure 49 the St@ndby Office (Hadi Teherani AG 2009)	80
Figure 50 the St@ndby Office adjusted to function within a single space (modeled by: Ryan Yee)	80
Figure 51 Four Works Workstation (Four Design 2009)	81
Figure 52 different views of the Four Works workstation (Four Design 2009)	81
Figure 53 Four Works adjusted to function within a single space (modeled by: Ryan Yee).....	82
Figure 54 Globus Artifort's 'All-In-One Computer Workstation (Furniture 2007-2010).....	83
Figure 55 (Left) Bungee Table unit and (Right) Bungee Table configuration (Global Upholstery Co. Inc. 2009)	84
Figure 56 Bungee Table configurations for Collaboration and/or Meeting Spaces (Global Upholstery Co. Inc. 2009).....	84
Figure 57 (Left) Bungee Cord system and (Right) 'Flip-Flop' position (Global Upholstery Co. Inc. 2009)	85
Figure 58 Furniture flexibility within a single space (modeled by: Ryan Yee)	86
Figure 59 the Silver Chair (Hadi Teherani AG 2009)	86
Figure 60 the Charta Chair design by 3Sphere (3Sphere 2009 2009).....	87
Figure 61 the 'CityHall' in Different Formations (Krumnikl Environment n.d.)	88

Figure 62 Marcello Zuffo's 'Growing Family' (Interior Design Inc. 2007-2009)	89
Figure 63 Wall Surface with Traxx and Tile System (Kimball Office 2010)	90
Figure 64 some Applications to the Traxx and Tile system (Kimball Office 2010).....	90
Figure 65 System Furniture Mounted onto Traxx and Tile System (Kimball Office 2010)	91
Figure 66 Examples of the Paper Softwall (Molo Studio Ltd. 2008)	91
Figure 67 Instructions for setting and packing the Softwall (Molo Studio Ltd. Autumn/Winter 2009)	92
Figure 68 Softwall design with window and LED Lighting (Molo Studio Ltd. Autumn/Winter 2009)	93
Figure 69 Modular Softwall + Softblock Accessories (Molo Studio Ltd. Autumn/Winter 2009) ...	93
Figure 70 Surf Chair, designer Leif Sorensen won the Scandinavian Furniture Fair 2000 for Best Product Award (Lylover design 2009).....	94
Figure 71 Extendable Screen design by Tom Dixon (Bonluxat 2010)	95
Figure 72 Mobile Screens by Leef (Leef n.d.).....	95
Figure 73 'Neighborhood Work Club' by.....	96
Figure 74 McKinsey & Company 'Lounge Tables' (Myerson and Ross 2003, 87-88).....	103
Figure 75 the Workplace Index (WPI) formula representing the Ideal Office (Gensler 2008)	105
Figure 76 the Characteristics and benefits of Horizontal and	107
Figure 77 the (Left) Horizontal Integration and (Right) Vertical Integration (O'Neill and Wymer 2009, 2)	108
Figure 78 Relative Proportion of Horizontal and Vertical Integration across.....	109
Figure 79 Design Process- 'New Office' Approach (Ryan Yee).....	113

Bibliography

1. 3Sphere 2009. *Charta Chair*. 2009. <http://www.3sphereonline.com/charta.php> (accessed February 13, 2010).
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