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Exploring the effectiveness of non-territorial workspace at alternate workplaces

Tina Patel
Iowa State University

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Exploring the effectiveness of non-territorial workspace at alternate workplaces

by

Tina Patel

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
MASTER OF FINE ARTS

Major: Interior Design

Program of Study Committee:
Çigdem T. Akkurt, Major Professor
Jihyun Song
Brenda Jones

Iowa State University
Ames, Iowa

2016

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DEDICATION

This thesis is dedicated to my parents, my husband and my daughters for their unwavering support and encouragement in this journey.
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ABSTRACT

Workplace environments are ever changing and typically contingent upon various changes that take place in society including economics, demographic shifts, and technology (Maitland & Thompson, 2011). In last decade, pendulum for workplace environment has gone back and forth from vastly open offices to private arrangements. One trend that has emerged recently is the Alternate Workplace Strategy (AWS). This strategy expands definable work zones beyond the individual assigned or unassigned workspace, creating a combination of elements like workstations, open and enclosed collaboration and interaction zones and so on. The core value of this strategy is to create a workplace that is a stronger tool for people to create business results (Becker & Steele, 1995). The unassigned or non-territorial workspace is where the individual employee has no dedicated personally assigned office, workstation, or desk (Becker & Steele, 1995). Most of the research in workplace focuses either on impact of open office space on employee’s well-being, productivity, interaction or issues related to privacy and focus. Significant research is not found in the area of unassigned workspaces based on the model of AWS and its relation to employees’ satisfaction and engagement.

Grounded in research that includes the history of workplace design, issues inherent in organization and operation, and matters associated with individual productivity within the workplace environment, the purpose of this thesis is to better understand how non-territorial workspace in an AWS model translates into an effective workspaces. Family and Work Institute (http://www.familiesandwork.org/) categorizes six components for an effective workplace. The six categories are: opportunities for learning, supervisor support for work success, autonomy, culture of trust, work-life fit and satisfaction with earnings, benefits and
opportunities for advancement (Families and Work Institute, 2012). For the purpose of this thesis, only three categories: opportunities of learning, autonomy and culture of trust are taken into consideration as the other three categories focuses more on workplace operation and policy making and not particularly on spatial parameters. The primary research questions driving this study are: What spatial characteristics in non-territorial alternate workplace make them effective workplaces? Do these spatial characteristics contribute positively to employees’ engagement, satisfaction and retention?

This thesis is researched through the lens of two case studies of firms recently designed on this strategy. Mixed methodology i.e. primarily qualitative with quantitative survey nested into it is used for this study. Grounded theory, one of the strategies of qualitative research methodology is applied to this research as an overarching methodology and as a method for analyzing the data. The thesis is aimed to reveal the participants’ perspectives and interpretations of their own actions/behavior and their physical environment on effectiveness in relation to the non-territorial alternate workplace. The information helped in development of an overarching theoretical scheme for integrating categories and describing the employees’ experiences of their work environment from the various perspectives.

This thesis will help bridge that gap and document how the strategy of non-territorial workplace can translate into an effective workspace for the employees where they can be engaged, satisfied and plan to stay longer. This study will provide recommendations that could inform design practitioners, educators, and contribute to the overall body of knowledge in this area.
CHAPTER 1. OVERVIEW

Introduction

Workplace environments are ever changing and they are typically contingent upon various changes that take place in society including economics, demographic shifts, and technology (Maitland & Thompson, 2011). Kevin Kuske, general manager for Turnstone, an office furniture manufacturer that specializes in small and emerging companies, views workspace design as, "Vibrant cities have various zones -- for play, concentration, collaboration, socialization and creativity. Every great workspace should, as well. The overall setup of the space is crucial to creating a productive work environment." (Kuske, 2010). The design of workplace environments greatly impacts the success of the organizations within them, as these environments are essential to their function (Becker, 1981; Becker, 2004). As is the case with all aspects of history, it is important to reflect upon the history of the office built environment to understand the impact on success of organization and employee’s productivity and well-being.

In last decade, pendulum for office built environment has gone back and forth from one extreme to the other, from vastly open offices to private arrangements. The open office plan has recently been a common trend among corporations. Positive characteristics of the open office plan include enhanced collaboration through the arrangement of workspaces that increase interaction (Heerwagen, Kampschroer, Powell, and Loftness, 2004; Hua, Loftness, Kraut, and Powell, 2010), as well as the decreased use of permanent walls, which allows for higher flexibility and lower renovation costs (Duffy, 2008; Saval, 2014). Another trend that has emerged recently is the Alternate Workplace Strategy (AWS). This is a much broader idea that expands definable work zones beyond the individual assigned or unassigned
workspace (workstations and offices), creating a combination of elements like workstations, benches, open collaboration, closed collaboration (huddle or conference rooms), and so on. The core value of a workplace strategy delivered as AWS is to create a workplace that is a stronger tool for people to create business results (Franklin & Steele, 1994). Figures below show, Steelcase Global Headquarters and Steelcase University in Grand Rapids Michigan. In these illustrations, AWS are associated with coffee bars, work cafés, and small meet up areas that are used for connection activities. Enclosed team meeting areas for collaboration activities and enclaves and quiet spaces used for concentration activities are also a part of spatial palette for this facility (Steelcase, n.d.c).

Figure 1. Steelcase Headquarters - Café
Photo courtesy of: www.steelcase.com
(steelcase, n.d.a)

Figure 2. Steelcase Headquarters Collaboration Zone
Photo courtesy of: www.steelcase.com
(steelcase, n.d.a)

An unassigned or non-territorial workspace is where the individual employee has no dedicated personally assigned office, workstation, or desk. Depending on the system in place, people either call ahead to reserve an office or workstation or upon arriving take any available workplace that suits what they are going to do. In many ways this is much more
radical departure from typical office accommodation than working in a satellite office or telecommuting (Franklin & Steele, 1995).

An initial literature review indicated that most of the research in workplace focused either on impact of open office space on employee’s well-being, productivity, collaboration, interaction or issues related to privacy, focus and productivity. There is some research done on alternate workspace, work culture and communication of company’s business model. However, there was not very significant research found in the area of 100% non-territorial workspaces based on the model of alternate workplace and its relation to employees’ satisfaction and engagement.

This study started with posing questions on the effectiveness of alternate workplace model with non-territorial workspace. Grounded in research that include the history of workplace design, issues inherent in organizations, and matters associated with individual productivity within the workplace environment, the purpose of this study is to better understand how non-territorial office space in an alternate workplace strategy model translates into an effective workspaces. Workplace design is an ever-evolving spectrum of the built environment, and this study will work to expand the knowledge base and understanding of success of alternate workplaces. Through a review of literature, an original research, this study will provide recommendations that could inform design practitioners, educators, and contribute to the overall body of knowledge in this area.

**Rational of the Study:**

Since 1997, the Families and Work Institute has been engaged in a research journey to define the elements of an *effective workplace*. They are able to do this as they have regularly conducted nationally representative study of the workforce the National Study of the
Changing Workforce. It has comprehensive and rigorous information about employees’ lives on and off the job. Thus, based on these studies we can look for those characteristics of workplaces that work for both employers (intention to remain on the job and higher job satisfaction and engagement) and for employees (better health and well-being, less work-family conflict, better personal or family relationships). Families and Work Institute has identified six criteria that meet these stringent criteria for effective workplace which are also depicted in Figure 3:

1. Opportunities for Learning
2. Culture of Trust
3. Work-Life Fit
4. Supervisor support for work success
5. Autonomy
6. Satisfaction with earnings, benefits and advancement opportunities

Figure 3. Six components of an Effective Workplace by Families and Work Institute
Photo courtesy of: http://www.familiesandwork.org/blog/effective-workplaceeffective-workspace/ (Families and Work Institute, n.d.a)
According to the Family and Work Institute, effective workplaces recognize that employees are an organization’s greatest resource and make a critical difference in the organization’s ability to not merely survive, but to also thrive. To be truly effective, a workplace’s design, practices and policies must benefit both the organization and its employees. When an organization takes this approach to employee’s development and management, the employees are highly engaged, satisfied and plan to remain with the organization. Effective workplaces don’t all look the same because they go beyond “industry best practices” to reinvent work around their employees’ needs as people and professionals, regardless of the job (Galinsky, 2014).

Employers increasingly recognize that well designed space plays a significant role in creating an effective workplace, which has helped to fuel the interest in the workspace of the future initiatives in so many companies. Some examples of spatial strategy described by Ellen Galinsky (2014), president of Family and Work Institute on workplace effectiveness are:

*Opportunities for Learning:* These opportunities don’t just happen formally with training and classes. They happen informally and can be helped or hindered by the arrangement of space, such as putting people together from different functions and levels, enabling people to sit in different places on different days, and having rooms for small and impromptu meetings.

*Culture of Trust:* Trusting relationships are also affected by physical space and the norms that are created to live in it. This includes having clear expectations of how people work together effectively, such as respecting others’ need for quiet or a clean space to work. It also includes planning activities where employees get together to get to know each other better and have fun.
Supervisor Support for Work Success: When employees of different organizational levels work side by side (and aren’t separated by hierarchy and corner offices), they can learn about each-others’ work and can offer more just-in-time support.

Literature review indicates that there are several studies conducted on collaboration, privacy issues, productivity and wellness at workplace. There is a fundamental lack of research on defining and evaluating effective workspace and establishing its relationship to employees. The six categories of effectiveness as defined by Family and Work Institute can be utilized to study the connection between effective workplace and effective workspace.

Purpose and Research Question

The purpose of this study is to understand how effective non-territorial alternative workplaces are through employees’ everyday experience.

Research Question: The primary research questions driving this study will be:

What spatial characteristics in a non-territorial alternate workplace make them effective workplaces?

Do these spatial characteristics contributed positively to employees’ engagement, satisfaction and retention?

The following secondary questions support the primary questions will be further discussed:

1. Why was the alternate workplace model with non-territorial workspace chosen for this new space? Was it cost driven or business driven?
2. Is a full gamut of spatial genres—from focus rooms to collaborations zones—provided for all employees? Are any utilized to their full potential or underutilized?
3. How does the design of the office impact opportunities for effective collaboration?
4. How does the design of the office impact opportunities for effective individual work?
5. What design and spatial elements of the office provide opportunities for learning for the employees?

6. What design and spatial elements of the office provide culture of trust for the employees?

7. What design and spatial element of the office provide autonomy for the employees?

8. Has the new design led to better employee engagement, satisfaction and retention?

The purpose of this thesis is to understand the effectiveness of alternative workplace model with 100% non-territorial workspaces through employees’ everyday experience. This will be researched through the lens of two case studies of firms recently designed on this strategy. Mixed methodology i.e. primarily qualitative with quantitative survey nested into the qualitative methodology, is used for this study. Grounded theory, one of the strategy of qualitative research methodology is applied in this project as the overarching methodology as well as a method for analyzing the data. Grounded theory, is generally used as a discovery oriented approach to the development of new theory or expanding the existing framework. It becomes a general methodology for developing a theory or framework which is grounded in data. The data are the voices of the actors or participants. There will be five participants from each firm who will be interviewed to understand the effectiveness of the workplace. Due to the time constraints in interviewing all the employees in both case studies and to capture most all target audience a survey is send to all the participants to understand the effectiveness of this typology. The quantitative data gathered from the survey and results will assist in interpretation of the qualitative findings.

Utilizing the two methods, the researcher will gain broader perspectives rather than using predominantly one methodology. In this study the participants are employees of the
two firms selected as case study who are working in non-territorial, alternate workplace. The study aims to reveal the participants’ or actors’ perspectives and interpretations of their own actions and their physical environment on effectiveness in relation to the non-territorial alternate work environment. The information will help develop an overarching theoretical scheme for integrating categories and for describing the employees’ experiences of their work environment from the various perspectives.

**Definition of the Key Terms**

*Working Environment* refers to a spatial area having a functional role for producing any profits as a corporation. As the term has its origin in environmental psychology, any physical spaces designed and used for specific activities can be defined as the concept of workspace, and the places have people’s social and professional relationships (Fischer, McCall, & Morch, 1989).

*Effective Workplaces* are associated with better employee outcomes like: employee engagement, job satisfaction and turnover intention. To be truly effective, a workplace its design, practices and policies must benefit both the organization and its employees. When an organization takes this approach to employee development and management, you have employees who are highly engaged, satisfied and plan to remain with the organization.

*Opportunities for Learning* refers to a job where the meaning and importance of the work is clear; that encourages learning and creativity; and has enough task variety to keep you interested.

*Culture of Trust* indicates a workplace culture where supervisors are trustworthy, ethical, and seek your input to improve performance.
Autonomy is the degree of control, responsibility and discretion the individual has over content, method, location and tools of work process (Liang, Duffy, Jaunzens et al. 1998).

Job satisfaction refers to an overall emotional fulfillment of employees’ expectations or pleasure, and the fulfillment can be oriented from working environments. There are diverse correlated factors with job satisfaction, such as environmental features, physical conditions, or overall environmental satisfaction. It can be usually measured in multidimensional terms. Job satisfaction refers to a “pleasurable or positive emotional state, resulting from the appraisal of one’s experiences” (Locke, 1976, p. 1300, cited in Danielsson & Bodin, 2008).

Flexibility, according to Alfred P. Sloan Foundation, national workplace flexibility initiative, "Flexibility is about an employee and an employer making changes to when, where and how a person will work to better meet individual and business needs. Flexibility enables both individual and business needs to be met through making changes to the time (when), location (where) and manner (how) in which an employee works. Flexibility should be mutually beneficial to both the employer and employee and result in superior outcomes.” (Aequus Partners, 2010).

Flexible Work (or mobile work) refers to work style in which a person consistently uses multiple spaces/places in which to accomplish his or her work.

Alternative Workplace Strategy (AWS) is a much broader idea that expands definable work zones beyond the individual assigned or unassigned workspace (workstations and offices), creating a combination of elements like workstations, benches, open collaboration, closed collaboration (huddle or conference rooms), and so on.
Benching refers to open-plan workstations typically consisting of a long, rectangular desk occupied by multiple people.

Collaborative Workspace means open areas for meeting and collaborating in the office. These spaces are part of an open plan office and may include minimal dividers between seats.

Huddle Room is smaller room, usually assigned to a specific department, to be used for daily team or staff meetings or other quick get-togethers or stand-up meetings.

Meeting Room is collaborative space enclosed by four walls and typically able to accommodate from three to more than twenty people.

Phone Room is a small, enclosed space, typically able to accommodate one or two people and often used for private phone conversations.

Workstation is an individual workspace that can be connected to a series of desks and includes separations in the form of dividers and file storage space.

Hoteling or “Hot desking,” is where no dedicated and nonpermanent workstations are “booked” on a first-come, first-serve basis.

Unassigned or non-territorial is workspace is where the individual employee has no dedicated personally assigned office, workstation, or desk.

Free address, where workers or teams sort out their table assignments or workstations on the workday itself.

Desk sharing, where two or more employees share a table or workstation based on an agreed schedule of use.

Work from home programs, wherein employees do just that, and come to the office periodically, for reporting, meetings and other collaborations.
Significance of Research

There are so many questions around taking the plunge to a hundred percent non-territorial workplace and alternate workplace strategy, and for good reason: research in this area is lacking, in large part due to the fact that most organizations do not want to share their experiments openly. On top of that, many design firms have non-disclosure agreements with organizations that have made the change, which means conversation in the industry isn’t really flowing, either. This study will help bridge that gap and document if this strategy of non-territorial workplace has translated into an effective workspace for the employees where they are highly engaged, satisfies and plan to stay with the organization.
CHAPTER 2. REVIEW OF LITERATURE

Introduction

This chapter begins with an overview of 20th and 21st century workplace design and the organizational frameworks and factors informing its design. Following this is an overview of the current trends and factors impacting the design of office spaces today. The context of these environments is explored through key aspects like new technology, business and organizational culture. The role of workplace design on employees’ productivity and satisfaction is reviewed. Lastly, the effective workplace and workspace model presented by Families and Work Institute is discussed as the research framework guiding the investigation of employees’ engagement, satisfaction, and retention at workplace environments. Some emerging concepts to understand the relationships between the employees and their work environment are elaborated like territoriality, privacy and interaction.

Rather than providing a basis for the formulation of a hypothesis to be tested, this literature review identifies and describes the context for exploring the meaning and significance of the finding grounded in the experiences of the employees.

Overview of Workplace Design

Knowing where we have come from is essential to understanding where we are today and what our options are moving forward. (Laing, 2006, p.29)

Given the prevalence of office environments today, it is important to understand how the office, as a building type came into being. Offices have always existed but it wasn’t till early 20th century that a shift occurred in the way they were designed. In ancient times, an office might have been the space two people occupied as they shook hands on deal. As economies and industries grew, offices became more formalized (Piotrowski, 2016). Specialized office
work developed as the professions and new form of business evolved. Major shifts in building materials, communication technologies, and cultural awareness continue to shape workplace conditions for employees today.

At the turn of the 20th-century, office buildings were constructed using basic materials such as masonry, stone, cast iron, heavy timbers, terracotta, and wood floors. Building amenities and communication technologies included the passenger elevator, gaslight, electric light, voice tubes, and the telegraph (Pile, 2005). As economies expanded, the demand for basic typing skills, accounting services, and information processing rose. To meet growing business and industrial goals, office employees worked long hours, often in dark interiors filled with rigid furnishings. Employees were subjected to poor lighting, small and dusty rooms, engine noises and confined spaces.

Figure 4. Workers in a private office, voice tubes communication technologies, c. 1901. Photo courtesy of: www.officemuseum.com (office museum, n.d.a)
As new building materials continued to evolve (e.g., structural steel and glass curtain walls) and elevator service expanded upward, building heights increased leading to the birth of the iconic image of a skyscraper. During this time, the industrial revolution, while the office buildings became a fixture of society, architects and the designers began to move their focus indoors, to how the interior office space could improve efficiency and later, work satisfaction. Figure 5 illustrates office environments for clerical workers and arrangements of desks in tight rows.

Figure 5. Comptometer Bureau, Armour & Co., Chicago, 1926. Armour & Co. was a meat Business. Photo courtesy of: www.officemuseum.com (office museum, n.d.a)

This shift included the ideals of Frederick Winslow Taylor, who introduced scientific management based on his time and motion studies. As a chief engineer at Philadelphia’s Midvale Steel Company around the turn of the century, he studied how tasks and systems, as
a whole, could be performed more efficiently to save time for the company. Taylor published, *The Principles of Scientific Management* in 1911, which, comprised of a strict set of laws, rules, and practices geared to maximize prosperity for both employers and employees. Industrial psychologists, Frank and Lillian Gilbreth, followed Taylor’s research with a focus on workplace productivity, human fatigue, and employee well-being. Architects were quick to respond to these new workplace processes and designed large open offices to reflect factory-like settings, with desks and typewriter assemblies in rigid, synchronized rows where employees work habits could be easily observed by management (Knight & Haslam, 2010).

Frank Lloyd Wright’s Larkin Administration building was constructed in 1904, the same time Taylor was developing the ideals. Frank Duffy, in *Work and the City*, stated that Larkin’s building was “a perfect image of culture of control” (Duffy, 2008, p.44). The building was designed to accommodate a mail-order firm with a large with a large clerical staff. The main feature of this workspace was an open central court providing efficient ventilation and lighting as well as supervision by management. It was constructed to include a large skylight in the roof so all employees would be able to work in the single room with access to natural light. Efficiency, a cardinal rule of Taylorist ideals, was of the utmost importance for the Larkin building (Albrecht & Broikos, 2000). This is exemplified by the design of the light court, which was an atrium like great room filled with workstations for the clerical staff that was completely open for the purpose of supervision and supreme efficiency (Blake, 1996). It became an excellent example of the application of classical theories embodying the principles of scientific management and bureaucracy (Duffy 1992, Duffy 1997, Donald 2001, Sundstorm 1986). From 1920s and 1930s, the working conditions of
workplaces gradually improved because of greater awareness of the relationship between physical environment and productivity of work in factories.

Figure 6 and 7. Larkin Building by Frank Lloyd Wright. Photo courtesy of: www.officemuseum.com (office museum, n.d.a)

In the 1960s, the German Quickborne team, founded by the brothers Wolfgang and Eberhard Schnelle, developed their Bürolandschaft space plan, also known as the office landscape. The Schnelle brothers viewed office as an organic whole, made up of finally interlinking parts and an enormously complex network of paper flow (Saval, 2014, p. 201). The Quickborne team maximized efficiency and progress through their understanding of communication and paper flow. They looked specifically at patterns of communication in the organization and developed a spatial layout to enhance collaboration among all workers. The team most effectively supported this understanding by arranging workstations through the use of studied spatial arrangement and screens. The design solution appeared more random,
haphazard in nature, and spread out across the office landscape. The flexibility and sheer novel appearance of Bürolandschaft was quite liberating to the workers within it. The executives embraced the concept even though they would be giving up their private offices, due to the immense level of cost reduction it would provide. This new approach received a great deal of criticism, the merits of which are still debated today.

![Floor plan of the Bertelsmann Verlag in Gütersloh, 1961](image)

**Figure 8.** Floor plan of the Bertelsmann Verlag in Gütersloh, 1961, photo © Quickborner Team

The first application of the open landscape concept in United States was in DuPont’s Freon Products Division in Wilmington, Delaware in 1967, which actually served as more of an experiment than a wholehearted embrace of the concept. This particular office was subject to high and distracting noise levels. Even while employees spoke in hushed tones to try to alleviate the noise issues, there was no remedy for the high-pitched phones and typewriters. Carpet and sound screens helped but did not solve the problem (Pile, 2005).
In response to the Bürolandschaft office concept, a new line of office furniture was designed by Robert Probst, working for Herman Miller in the United States of America. Action office was not only innovative in design but was also an actual product line available to the masses. The traditional office desk, typewriter return, and credenza were converted into a new workspace and assembled from a modular kit of parts, consisting of panels, work surfaces, vertical storage units, and several finish options. In 1985, the World Design Congress recognized the Action Office furniture system as the most significant industrial design introduction to workplace environments. After the action office, the office furniture was regularly developed as systems furniture, incorporating moveable, interlocking panels with desks and files attached (Liang 1997, Pile 1978, Duffy 1992).

Figure 9. Herman Miller – Action Office 2, Photo courtesy of: www.hermanmiller.com (Herman Miller, n.d.a)

Furniture and equipment for the office environment continued to change during the later years of the twentieth century and continues to evolve today. Ergonomically designed
seating was introduced in the late 1970s. New office products have given the office a more open look, deemphasized cubicles and harking back to the early days of open plan. Teaming concepts in the office also spurred the redesign of office planning to be more open, using shorter height panels and more open desks for collaboration (Piotrowski, 2016).

By the end of the 20th-century, desktop computers replaced the typewriter and electronic mail provided an immediate exchange of information and documents over postal mail. From this time forward, workers were connected in the office, at home, and around the world (Gillies & Cailliau, 2000; Kluver, 2000; Masuda, 1982; Wershler-Henry, 2005). Workers found new ways to work, places to work from, and access to business opportunities near and far. These technological changes in client and worker communication have impacted the layout of offices. Enhanced environmental planning has also become important in today’s offices.

**Offices in 21st Century**

Several new trends related to changes in worker populations and business focus emerged at the beginning of the 21st-century resulting in a new set of challenges for organizations. A workforce that was much more diverse in age, gender, ethnicity, and household composition. In simple terms, a workforce that had older workers, dual income households, single parents, women with young children, and people of color (Becker & Steele, 1995). Changes in the population demographics brought four generations into the workplace, and organizations were challenged to manage four unique sets of values and expectations in the workplace (O’Neil, 2009; O’Neill, 2010). The mobile worker population expanded due to advancements in technology, and employees could work anywhere and everywhere and still get their jobs done (Alberts & Papp, 1997; Davis et al., 2011; Haworth,
n.d.a; Heerwagen et al., 2012; O’Neil, 2009; Ouye, 2011). There was also a new interest in teamwork and collaboration as products and services became more complex and more expensive to develop at the same time that the need to speed up the development process was increasing. Hence the work pattern in the 21st century changed to encompass more creative and complex groups and the technological changes. This also led to the change in the speed of work, which increased dramatically because of the advances in the information technology. Because of this the businesses started getting more competitive and the market is fast, tight, intensive and also unstable. The organizations had to rethink their management styles, their structure and ways of work (Laing 1997). Hanmer and Champy discussed that the change is the practice in business. The focus changed from activity and results to performance measures and commensurate compensation. Values changed from protective to productive, and managers from supervisors to coaches. Organizational structures have changed from hierarchical to flat, and executives from scorekeepers to the leaders (Hammer and Champy, 1993).

Duffy (1997), pointed the contrast between the assumptions of conventional office and the expectations that are creating the new office environments. The table below elaborates this shift.
Table 1. The contrast between the assumptions that underpinned the conventional office and the expectations that are creating new office environments (adapted from Duffy, 1997, p.58)

<table>
<thead>
<tr>
<th>CONVENTIONAL OFFICE ASSUMPTIONS</th>
<th>NEW WAYS OF WORKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATTERNS OF WORK</td>
<td>Routine process, individual tasks, isolated work</td>
</tr>
<tr>
<td>PATTERNS OF OCCUPANCY OF SPACE OVER TIME</td>
<td>Central office locations in which staff are assumed to occupy individually ‘owned’ workstations on a full-time basis, typically over the course of the 9 to 5 day.</td>
</tr>
<tr>
<td>TYPES OF SPACE LAYOUT, FURNITURE SYSTEMS, AND USE OF SPACE AND BUILDINGS</td>
<td>Hierarchy of space and furniture related to status. Individual allocation of space predominates over interactive meeting spaces.</td>
</tr>
<tr>
<td>USE OF INFORMATION, TECHNOLOGY</td>
<td>Technology used for routine data processing, terminals in fixed positions served by mineframes.</td>
</tr>
</tbody>
</table>
each other as partners, rather than ‘boss and employee’ or ‘manager and managed’ (Lange, 2000). Another emerging pattern revealed above in the table is flexibility. Workers come to the workplace with new expectations around flexibility and connections with others and the outside world. Organizations offering employees a choice of when, where, and how to work have 12% more satisfied employees and see their workplace as innovative (Gensler, 2013). The employees also need a sense of empowerment, allowing them to make certain decisions themselves rather than going through many layers of management and perhaps waiting for days for decision to be made (Piotrowski, 2016). Today’s workers are more concerned with balancing their personal and business lives as evidenced by the adoption of such workplace options as flex-time, working from home and on-site daycare (Family and Work Institute, 2011). Corporations are addressing these lifestyle needs because it helps them attract and retain employees (Challenger 2000, Smith 2007).

Gensler’s 2013 workplace study suggests that “enabling choice with the right alignment of tools, policies, and spaces is an opportunity for companies to create a climate in which autonomous, engaged employees can make meaningful decisions to maximize their individual job performance” (Gensler, 2013, p. 14). The total workplace is about process as well as product.

**Emerging Trends in Workplace Design**

All the shifts happening in pattern of work and occupancy mentioned above impacted the workplace design significantly. Some major objectives of the workplace gathered from various resources are:

- Enhancing social activity (spaces to promote discourse and face to face interaction for shared information between employees) (Duffy 1997, Tuner & Myerson 1999).
- Team building and collaboration (Becker 2004)
- Emphasizing flexibility, which involves the provision of muti-use space and layouts that can be adapted rapidly for different work activities. (Duffy 1997)
- Enhancing visual appeal, for conveying the message of the organization and retaining and attracting talented staff, stimulating the employees ideas, providing a comfortable and welcoming environment (Mooradia, 2000)
- Increasing controllability and reflecting end-users demands (Duffy 1997)
- Emphasizing effectiveness by paying attention to four modes of working (Gensler, 2008)

Organizations and designers have been experimenting with the physical workplace to optimize productivity since the conception of the office during the time of the Industrial Revolution. Variations of open and closed office systems have been employed over the years. The trend in new office workstations today is to create small but comfortable open workstations with low panels, for all office employees, to create a total collaborative environment. This trend also supports access to window views for all employees. This type of open office concept is not new, but what is different is how the space previously occupied by upper management in their closed offices, many with windows, is being utilized now. The window area is now given to all employees that are now in workstations with low panels. Closed common areas, available to all office workers when they have a need for privacy, are placed in the center of the building; these new closed spaces may have glass walls to allow daylight to filter into the spaces (Piotrowski, 2016). Manufacturers of the office systems are producing new workstations design to meet with this new demand from organizations hoping
to increase employee productivity. Organizations and designers are making choices on the types of workstations that will benefit office workers as well as reduce overhead costs.

One of the trend seen in the workplace environment is a workplace based on the model of Alternate Workplace Strategy (AWS). Alternative Workplace Strategy (AWS) is a much broader idea that expands definable work zones beyond the individual assigned or unassigned workspace (workstations and offices), creating a combination of elements like workstations, benches, open collaboration, closed collaboration (huddle or conference rooms), and so on. All of it contributes to the final tally of seats where people can work in the space (Mick, 2015). For example, instead of counting 80 workstations and 20 offices for 100 people (traditional conference room-type seats not included), AWS may count 50 work stations, 10 offices, 20 open collaboration seats, and 20 closed collaboration seats for the same 100 people. AWS can be 100 percent unassigned, but in a sense it is not the key consideration. The core value of a workplace strategy delivered as AWS is to create a workplace that is a stronger tool for people to create business results. Designing such an environment into smaller social units by differentiating the furniture, technology, and behavioral clues (i.e., team identity, branding, flexibility, and activity levels) provides important behavioral clues for people to choose their best suited work environment. The belief is that such variation may create stronger social groups capable of producing greater business results (Franklin & Steele, 1994).

Collectively, Figure 1 and 2 in Chapter 1 illustrate examples of AWS located in the workplace environment of Steelcase Global Headquarters and Steelcase University in Grand Rapids Michigan. In these illustrations, AWS are associated with coffee bars, work cafés, and small meet up areas that are used for connection activities. (Steelcase, n.d.c; Steelcase,
n.d.d). Hence, office based on Alternate Workplace Strategy (AWS) model can have seats which are 100% unassigned or combination of assigned and unassigned. This trend in workplace design has emerged since 1990s which were concerned with new ways of work and newly emerging cultures. Examples include: hoteling, non-territorial, just-in-time, free address, group address, or shared office. The essence of these unassigned office approach is the same, the individual employee has no dedicated personally assigned office, work station, or desk. Rather, depending on the particular system in place, people either call ahead to reserve an office or workstation, or upon arriving simply take any available workplace that suits what they are going to do. In many ways this is a much more radical departure from typical office accommodation than working in a satellite office or telecommuting (Becker and Steele, 1995).

Non-territorial offices have become the standard form of office accommodation for all IBM, UK and Canadian marketing and sales staff offices. More than twenty locations in the USA are now in the process of implementing their own versions. Ernst and Young has adopted non-territorial offices in USA and England, and Anderson Consulting has adopted them in United States, England and Japan. Becker and Steele (1995) researched that the companies using this model see the move to come from non-territorial office as primarily a means of improving overall organizational effectiveness and profitability. These kind of organizational changes are facilitated by non-territorial offices that promote informal and spontaneous communications among the staff who sit in different locations each day, thereby widening their circle of contacts and friendships. Further mixing comes from space allocation policies that encourage and reinforce minimal status distinctions and disciplinary boundaries, easing the natural flow of information in the office. It also comes from managers operating
under the same conditions as other employees, sharing the same space and resources, and thereby demonstrating their commitment to the new organizational patterns by modeling the desired and appropriate behaviors.

**Discussion**

The review of literature presented in the previous sections highlight alternative workplace strategy with non-territoriality as a major concept in a new trend of workplace design which emerged from 1990s. No longer there was a need for a permanent desks in the workplace, instead the workers were able to choose their workspace as the need (Duffy 1997, Becker and Steele 1995). The intent with alternate workplace strategy model with unassigned or non-territorial workspace is to provide the employees with tools they need to work effectively and then hold them accountable for high level of performance. The informal and spontaneous communication among the staff who sits in different locations each day is the key, thereby widening their circle of contacts and friendships hence reinforcing the minimal status distinctions and disciplinary boundaries, easing the natural flow of information in the office.

Becker and Steele (1995) in their study recognize that this model does represent the loss of dedicated, personally assigned offices and workstations in a central office contributing to a sense of homelessness. They further add that this can be overcome by encouraging people to treat the whole place as their own rather than their workspace as their own. Shifting this focus of spatial identity from individual to group, this model can make the office feel like a home and create a sense of identity. But there are many arguments and criticism about the advantage and disadvantage of non-territorial workplace. Most importantly the question about the effectiveness of these places is yet not been researched
sufficiently. This study acknowledges this through its focus on employees and their understanding of how the non-territorial workplace impacts their engagement, satisfaction and desire to stay with the firm based on this model.

**Key Behavioral Concepts**

This section focuses on some key concepts like privacy, territoriality and interaction to understand the relationship between employees and their physical environment.

**Privacy**

Privacy concerns one’s ability to control the environmental conditions so as to regulate the back-and-forth exposure to visual, auditory, and olfactory stimuli (Rengel, 2012). Based on this definition, privacy is a central process of regulation by individuals or groups that make themselves accessible and open to others in a varying degree (Altman, 1975). Social scientist Westin (1967) identified four types of privacy: solitude (being alone), intimacy (being alone with someone else), anonymity (blending in with a crowd), and reserve (using psychological barriers to control intrusion).

Workplace privacy has two levels: architectural privacy and psychological privacy. Architectural privacy refers to the visual and acoustic isolation provided by the surrounding environment (Wang, 2009); the psychological privacy is defined as the need of control over ones’ accessibility to others (Altman, 1975; Sundstrom, Burt & Kamp, 1980). Wang (2009) further explained that architectural privacy at workplace could be measured by the features of the physical environment, for instance, the height and number of partitions available for an individual worker. The highest level of architectural privacy in a workspace is working in an enclosed private office with four opaque walls (floor to ceiling) and a door. People who work in cellular offices are isolated from visual and acoustic distractions. They can decide on the
accessibility of others and the interactions with others. Hence, barriers (such as walls, partitions, doors and symbols) and field characteristics (such as shape, size, orientation and environmental conditions) act as privacy regulators (Kupritz, 2000). A study indicated that having more privacy and control over the accessibility by others, allowing employees to concentrate, and having collaborative workspaces are helpful to achieve functional comfort at a workspace (Vischer, 2006).

**Territoriality**

A territory is a certain extent of space to which a person or group lays claim. The boundaries may be clearly marked or somewhat ambiguous and users belonging in the territory will defend it against intrusion (Rengel, 2012). Sharkwawy (1979), classified four different types of territories which can be useful the designer:

1. Attached territory refers to one’s own personal space.
2. Central territories are highly personalized (a bedroom a cubicle at work).
3. Supporting territories are shared but close to home so that people have a sense of ownership and may personalize them. Examples include common lounges, and the sidewalk in front of one’s house.
4. Peripheral territories are clearly public and people use them but without having a particular sense of ownership over them.

According to the degree of control and duration of users’ claim to the space. Territories are classified as primary, secondary, and public territories. Primary territories are owned, used and controlled by exclusive individuals or groups on a relatively permanent basis such as a bedroom home or a private office or workstation. In primary territories user are highly aggressive to encroachments. Secondary territories are considered as a semi –
private or semipublic. They have elements of public access but also a degree of control by occupants such as bars and cafeterias. They have a relatively durable quality of ownership but it is temporal. Based on this classification, a workplace has two different territories—primary and secondary. The office, workstation or desk represents primary territory and the coffee shop in the work building, meeting areas, and corridors are secondary territories (Sundstorm 1986, Vischer 2005, et.al).

**Interaction**

Communication among individuals and group can be defined as formal or informal. Formal conversation typically involves job related message are exchanged between people and informal communication includes all other messages and friendly exchange between people through oral, face to face conversation (Sundstorm, 1986). The informal conversation is relatively unstructured information exchange and is seemingly inconsequential communication but serves critical functions such as coordination, learning, innovation and agility. Sundstorm (1986) further states that proximity between coworkers and visual accessibility is crucial to facilitate communication. Minimizing the walking distance between coworkers who need frequent contact and visual accessibility as typified in open office are physical design elements that can enhance communication. Though, lack of physical enclosure for workspaces is also associated with a difficulty to hold confidential conversations.

Osmond (1957), introduced the concept of sociopetal (facilitating social interaction) and sociofugal (discouraging social interaction) arrangements to encourage and discourage interaction. The spatial arrangement and location of boundaries like walls, partitions and
other barriers may contribute to cohesiveness and interaction among groups (Goodrich 1982 & Rashid and Zimring 2005).

**Relationship between People and their Workplaces:**

I think we have to transcend our role as designers, and realize that there’s another role that we’re responsible for. We have a depth of knowledge around how people perform work, and we can codify that information on areas of design practice. (Heiser, 2016)

Effective Workplaces are associated with better employee outcomes like their engagement satisfaction, and turnover intention (Gallinsky, 2014). Organizational effectiveness, contribution of workplace engagement and satisfaction, productivity, communication and interaction, and other job related behavior continue to receive attention by workplace designers, strategists and organizations. Measuring workplace effectiveness is valuable; understanding exactly what drives effectiveness up or down allows companies to fix problems and magnify strengths to design a workplace that is effective for knowledge economy work modes (Gensler, 2008). To be truly effective, a workplace—its design, practices and policies—must benefit both the organization and its employees. When an organization takes this approach to employee development and management, you have employees who are highly engaged, satisfied and plan to remain with the organization.

Several sources indicate that the physical setting contribute to organizations effectiveness. If work environment creates disruptive noise when a worker is trying to concentrate, one might expect a reduced level of performance or an increased time to complete the tasks (Wineman, 1986). Duffy (1974) further indicates that properties of physical setting such as space, size, shape, boundary controls, the structural capacity to accommodate various configurations, and space flexibility influence both organizational
properties like degree of participation, hierarchy of authority, centralization, job specificity, and complexity and routinization. It also affects social dimensions such as patterns of communication, perceptions of participation in decision making, and job autonomy.

Environmental psychologist Vischer, developed Building-In-Use (BIU) Assessment System with physical environmental dimensions including spatial comfort and privacy, lighting comfort, noise and building noise control, air quality, and thermal comfort (Visher 1996). Through this assessment the owners, managers and administrators can readily understand whether they have a good, average, or poor quality building according to the users of the building. Also concerned with the work environment McCoy (2002) proposes a framework for analyzing and understanding the complex relationships of people, their experiential processes, and the physical features of the workplace. Through an analysis of literature relevant to the behavior of people in the workplace, McCoy identifies as a major physical properties: spatial organization, architectonic details, views, resource, and ambient properties. In terms of spatial organization, McCoy (2002) identifies the following: the level of enclosure, adjacencies, density, and territoriality and size, shape, allocation and division of space including furniture configuration and circulation routine. With respect to architectural details, these include: ornaments or materials intended to embellish the environment such as decorative style, surface treatment, signage, color, and artwork which may encourage team identity and purpose. Resources refer to accessibility and functional characteristics of equipment and services that supports occupant’s work. Thermal comfort, illumination, sound/noise and air quality are included in the ambient properties. Lastly McCoy describes views as the observable features within or visible from the work area, including what can be seen in adjacent workspaces and what can be seen from the window.
These research indicates the role of build environment on organizational effectiveness. Hence, it is imperative to understand the categories of effectiveness in detail and study the correlation between physical attributes of the environment and the categories of the effectiveness.

**Framework by Families and Work Institute**

Since 1997, the Families and Work Institute has been engaged in a research journey to define the elements of an *effective workplace*. They are able to do this as they have regularly conducted nationally representative study of the workforce the National Study of the **Changing Workforce**. It has comprehensive and rigorous information about employees’ lives on and off the job. Thus, based on these studies we can look for those characteristics of workplaces that work for both employers (intention to remain on the job and higher job satisfaction and engagement) and for employees (better health and well-being, less work-family conflict, better personal or family relationships). Families and Work Institute has identified six criteria that meet these stringent criteria for effective workplace:

**Opportunities for learning**: A job where the meaning and importance of the work is clear; that encourages learning and creativity; and has enough task variety to keep you interested.

**Culture of trust**: A workplace culture where supervisors are trustworthy, ethical, and seek your input to improve performance.

**Work-Life Fit**: Having the support, schedule and flexibility you need at work in order to effectively manage your work and personal/family responsibilities.

**Supervisor support for work success**: Supervisors who provide you with honest and relevant information needed to do your job well and who recognize you when you a job is well done.
Satisfaction with earnings, benefits & advancement opportunities: Having reasonable benefits and earnings for your job and adequate opportunities for advancement.

Autonomy: The ability to decide or have input into what your job entails, how it is done, and to be true to yourself while doing it.

Figure 10. Six components of an effective workplace as per the Family and Work Institute Photo courtesy of: http://www.familiesandwork.org/blog/effective-workplaceeffective-workspace/ (Families and Work Institute, n.d.a)

According to the Family and Work Institute, effective workplaces recognize that employees are an organization’s greatest resource and make a critical difference in the organization’s ability to not merely survive, but to also thrive. To be truly effective, a workplace—its design, practices and policies—must benefit both the organization and its employees. When an organization takes this approach to employee development and management, you have employees who are highly engaged, satisfied and plan to remain with the organization. Effective workplaces don’t all look the same because they go beyond
“industry best practices” to reinvent work around their employees’ needs as people and professionals, regardless of the job.

Based on the 2008 National study of Changing Workforce data, the six categories of effectiveness were identified, all of which benefitted both employees and the organization. In the same study empirical relationship was established between these six workplace effectiveness and work related outcomes. The work related outcomes were, employee engagement, job satisfaction and turnover retention.

The result of effective workplace dimensions and work outcomes based on the survey are summarized in Table 2:

Table 2. Effective workplace dimensions significantly predicting work outcomes rank ordered by relative importance

<table>
<thead>
<tr>
<th>GREATER ENGAGEMENT</th>
<th>GREATER JOB SATISFACTION</th>
<th>GREATER PROBABILITY OF RETENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Climate of Respect</td>
<td>2. Work-Life Fit</td>
<td>2. Work-Life Fit</td>
</tr>
<tr>
<td>3. Autonomy</td>
<td>3. Climate of Respect</td>
<td>3. Opportunities to learn</td>
</tr>
<tr>
<td>6. Supervisor Task Support</td>
<td>6. Opportunities to learn</td>
<td></td>
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</table>

As stated above, effective workplaces are associated with better employee outcomes: employee engagement, job satisfaction and turnover intention. Effective Workplaces are linked to better health and well-being outcomes like: overall health, frequency of minor health problems, indicators of depression, general stress level and frequency of sleep problems. Employers increasingly recognize that well designed space plays a significant role in creating an effective workplace, which has helped to fuel the interest in the workspace of
the future initiatives in so many companies. Some examples described by Ellen Galinsky (2014), president of Family and Work Institute on workplace effectiveness are:

*Opportunities for Learning:* These opportunities don’t just happen formally with training and classes. They happen informally and can be helped or hindered by the arrangement of space, such as putting people together from different functions and levels, enabling people to sit in different places on different days, and having rooms for small and impromptu meetings.

*Culture of Trust:* Trusting relationships are also affected by physical space and the norms that are created to live in it. This includes having clear expectations of how people work together effectively, such as respecting others’ need for quiet or a clean space to work. It also includes planning activities where employees get together to get to know each other better and have fun.

*Supervisor Support for Work Success:* When employees of different organizational levels work side by side (and aren’t separated by hierarchy and corner offices), they can learn about each others’ work and can offer more just-in-time support.

Galinsky (2014), discusses some spatial strategies for some of the categories of effective workplace above. The spatial attributes of these categories of effectiveness could be further explored to study how they contribute to employees’ satisfaction, engagement and their retention.

**Discussion**

Literature review by the researcher indicates that there are studies conducted on collaboration, privacy issues, productivity and wellness at workplace. There is a fundamental lack of research on defining and evaluating effective workspace and establishing its relationship to employees. The six categories of effectiveness as defined by Family and Work
Institute can be utilized to study the connection between effective workplace and effective workspace. One of the emerging workplace trend is alternate workplace strategy with non-territorial workspaces, which will be used to research in testing the effectiveness of these spatial attributes of this model on employees’ attitude and behavior.

**Summary**

The review of literature presented in this chapter started with a general description of workplace design from 20th and 21st century highlighting the significant characteristics and changes. With the developments in information technology in 1990s patterns of work, occupancy of space over time, and of layout and furniture systems changed to accommodate/reflect a greater focus on mobility, diversity of work and relationships between employees as well as between employees and management. The research in human ecology and organizational psychology indicated impact of various environmental factors in workplace on human satisfaction, productivity and performance. The categories defining the effectiveness of work environment is discussed with an outcome of these factors on employees. The research also revealed a complex web of relationship between physical environment and organizational effectiveness and the need for these relationships especially in nomadic environments to be studies further. The study describes in this thesis responds to this need. The methodology for this study is outlined in the following chapter.
CHAPTER 3. MATERIALS AND METHODS

Overview of Methodology

This chapter describes the process and method used to explore the effectiveness of alternate workplace strategy with 100% non-territorial/unassigned workspaces. Alternate workplaces with non-territorial work environments represent new form to have emerged as a result of the changes happening in workplace environment. There is a significant lack of research on defining and evaluating effectiveness these workspace from their users’ viewpoint. The purpose of this thesis is to understand the effectiveness of alternative workplace model with 100% non-territorial workspaces through employees’ everyday experience. This will be researched through the lens of two case studies of firms recently designed on this strategy. Mixed methodology i.e. primarily qualitative with quantitative survey nested into the qualitative methodology, is used for this study.

Family and Work Institute (http://www.familiesandwork.org/) categorizes six components for an effective workplace. The six categories are: opportunities for learning, supervisor support for work success, autonomy, culture of trust, work-life fit and satisfaction with earnings, benefits and opportunities for advancement (Galinsky, 2014). As mentioned earlier for the purpose of this research, only three categories: opportunities of learning, autonomy and culture of trust will be taken into consideration. After an in-depth study the other categories were found to be more policy, management and operation driven and spatial attributes cannot contribute much towards effectiveness.

This chapter first explains the research methodology then defines and explains how the case studies were selected for this study. The process of data collection using semi
structured/open ended interviews and survey is outlined followed by a description of the way in which the data will be analyzed.

**Mixed Method Methodology**

The mixed-methodology design represents the most complete level of integration among two or more research designs. In this model, the researcher conducts aspects of both strategies in roughly comparable sequences. The advantage of such an approach is that the strengths of each research design can complement each other, while the weakness of each design can be substantially offset (Groat & Wang, 2002). The qualitative and quantitative research methodology is used for this study. Qualitative approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives (i.e. the multiple meanings of individual experiences, meanings socially and historically constructed, with an intent of developing a theory or pattern) or advocacy/participatory perspectives (i.e. political, issue-oriented, collaborative, or change oriented) or both (Creswell, 2003). Qualitative research is interpretive research, with the inquirer typically involved in a sustained and intensive experience with participants (Locke et al., 2000). The research methodology adopted for this study is primarily qualitative as this research tends to be more open ended in both theoretical conception and research design because it typically eschews the notion of a knowable objective reality (Creswell, 1994).

A quantitative approach is one in which the investigator primarily uses post positivist claims for developing knowledge (i.e. cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories), employs strategies of inquiry such as experiments and surveys, and collect data on predetermined instruments that yield statistical data (Creswell, 2003). Total employees in one
case study are 35 and in other case study are 60. Due to the time constraints in interviewing all the employees in both case studies and to capture most all target audience a survey is send to all the participants to understand the effectiveness of this typology. The quantitative methodology will be ‘less dominant’ methodology for this study, supporting the qualitative exploratory nature of this study.

**Sequential Exploratory Strategy**

Sequential exploratory strategy is characterized by an initial phase of qualitative data collection and analysis, which is followed by quantitative data collection and analysis. The priority is given to the qualitative aspect of the study (Creswell, 2003). The finding of the two phases are then integrated during the interpretation phase. This design is appropriate to use when testing elements for an emergent theory resulting from qualitative research and that it can be used to generalize quantitative findings to different samples. The primary focus of this study is to explore phenomena of effectiveness of the non-territorial workspaces with alternative workplace strategy. The quantitative data gathered from the survey and results will assist in interpretation of the qualitative findings. Utilizing the two methods, the researcher will gain broader perspectives of this phenomena.

**Qualitative Methodology**

*Grounded Theory Approach:*

Grounded theory, one of the strategy of qualitative research methodology is applied in this project as the overarching methodology as well as a method for analyzing the data. In grounded theory, the researcher seeks to enter a setting without preset opinions or notions, lets the going of setting determine the data, and lets a theory emerge from the data (Groat & Wang, 2002). Grounded theory, is generally used as a discovery oriented approach to the
development of new theory or expanding the existing framework. Hence, it becomes a
general methodology for developing a theory or framework which is grounded in data. The
data are the voices of the actors or participants. In this study the participants are employees
of the two firms selected as case study who are working in non-territorial workspaces, based
on the framework of alternate workplace. The study aims to reveal the participants or actors
perspectives and interpretations of their own actions and their physical environment on
effectiveness in relation to this framework.

In grounded theory researchers avoid using any preconceived theory or hypothesis in
the initial stage of the research. This enables them to more freely explore the study area.
Grounded theory encourages progressive direction rather than being pre-determined or fixed.
It requires both rigor and flexibility (Strauss & Corbin, 1998). In grounded theory, the
researcher is interested in patterns of action and interactions between and among actors with
the multiple perspectives of the actors being considered an important factor. The goal of this
study is to explore, understand and describe the experiences of actors i.e. the employees, in a
particular setting i.e. the two case studies selected, providing a basis for the generation of
theory grounded in data of participant’s experiences.

Case Study as a Method:

A case study is an empirical inquiry that investigates a contemporary phenomenon within its
real-life context especially when the boundaries between phenomenon and context are not
clearly evident (Groat & Wang, 2002). It involves studying a case in relation to the complex
dynamics with which it intersects. This research involves two architectural/design firms, as a
case study, which have been recently designed on the strategy of alternative workplace and
have 100% non-territorial workspaces. The effectiveness of the non-territorial workspaces in
an alternate work environment needs to be linked to several spatial attributes and this further impacts employees’ engagement, satisfaction and retention. This study aims in gaining an understanding of the contribution of these spatial attributes and developing a framework to help future designers through the lens of these case studies. 

*Criteria for Selection of Case Studies*: Selecting a sample site the study aimed to find a newly emerging dynamic workplace with the following characteristics:

- Open Layout
- Alternate Workplaces characteristics including- A variety of settings for concentrated individual work as well as group situations
- 100% Non-Territorial workstations and offices
- Employees working in nomadic situations

Keeping these overarching goal of study in mind the most useful design and spatial features would emerge from closely examining best practices i.e. good exemplars of existing non-territorial alternate workplaces. The researcher questioned selecting one case study or multiple. As per Yin (1994), the power of generalizability comes from the concept of replication which can be literal or theoretical. Literal replication is a case study that tests precisely the same outcomes, principles, or predictions established by initial case study. In contrast the theoretical replication is a case study that produces contrasting results but for the predictable reasons (Yin, 1994). The researcher chose multiple case studies because the nature of the theoretical question is narrower in scope for this study and the researcher would like to include all factors of importance and variations and choosing multiple case studies would allow for that.
An initial contact was made in Spring 2016 with several interior designers on International Interior Design Associate (IIDA) and American Society of Interior Designers (ASID), Northland board to find case studies which would have characteristics described above. The author learned from the board that there are were two architecture firms which recently designed their spaces on the strategy of alternate workplace with 100% unassigned/non-territorial workspace. The employees of these firms could choose where they want to sit based on their work for the day. These office feature bench-style workstations, conference rooms, and semi-enclosed lounge seating. The offices were move in ready almost at the same time, i.e. end of January. This would make a perfect case, as they share similar spatial characteristic, are same typology, i.e. architecture/design firms and would be move in ready at the same time i.e. in January 2016. The employees would have been in the space for six months by July 2016, making it ideal time frame to conduct this research. Approval was sought from the company representatives to make observations, conduct in-depth interviews with the designers and management and send survey/questionnaire to the employees to learn about their experience of this newly designed workplace. See Appendix A through D for the correspondence letters.

Here is the brief description of the two firms:

**Description of Firm A:**

*Employees*: 35 employees in downtown Minneapolis; 10,000 worldwide

*Business*: Full-service engineering and architecture firm

*Office Location*: Minneapolis

*Office Opened*: February 2016

*Size*: 9,050 square feet, *Floors*: One
Description of Firm B:

Employees: 60

Business description: Interdisciplinary architecture and design firm

Address: Minneapolis

Office opened: February, 2016

Size: 11,500 square feet, Floors: One
The study was conducted upon receiving approval from Iowa State University, Institutional Review Board (IRB) on July 19th, 2016. Please refer to Appendix F for the approval letter from IRB. The data was collected in seven working days in successive weeks. Since every participant had different schedules such as working out of office, attending off-site meeting, or field trips, the starting and finishing date for the data collection of each participant varied. Overall, the data were collected from July 20th, 2016 to August 1st, 2016.

**Data Collection**

The tools adopted for data collection were: observation and mapping of the case studies, in-depth interview with the lead designer and one of the key management personnel to understand the business driven and cost driven approach for this decision and how their approach has translated into an effective workplace. An in-depth interview was conducted with the senior designer not involved in the project to understand the intent and perception of the space and the spatial experience. Further, an online questionnaire/formal survey was send to the employees to understand their experience about their workplace. The questionnaire consisted of four parts: 1) demographic information, 2) overall work environment, 3) effectiveness and 4) opinion about the non-territorial workspace and one open ended question about the effectiveness of the workplace. This section elaborates on these data collection methods.

Ethical clearance were obtained from the Institutional Review Board at Iowa State University prior to all data collection on July 19th, 2016. The name of the architectural/design firms will not be disclosed in the study. They will be referred as Firm A and Firm B throughout the study. The participants were aware that their involvement in the study was completely voluntarily and confidential. Participants were informed that they were
free to withdraw from the study at any time without comment. Approval from the employees to participate in the study was obtained.

**Observations**

The two case studies selected for the study had following characteristics:

- **Open Layout**
- Alternate Workplaces characteristics including- A variety of settings for concentrated individual work as well as group situations
- **100% Non-Territorial workstations and offices**
- Employees working in nomadic situations
- Opened their office at the same time
- Approximately in the similar range of usable sqft
- Similar typology- architectural/design firm

The researcher interviewed the designer of each firm to understand the design intent and strategy, concept and how this translated into design. The researcher made observations of the two case studies for 3 hours total (one in morning, one in afternoon and one late afternoon). While the interview with the designer helped the researcher gain overall sense of design, the observations helped gain firsthand experience with participants and record information as it is revealed. Informed consent documents for observation and in-depth interview are included in Appendix B and C.

The POEMS framework is an observational research framework developed by Kumar in 2013, is used to make sense of elements present in context. The five elements of this framework are: People, Objects, Environment, Messages, and Services. Application of POEMS framework encourages researchers to examine these elements independently as well
as interrelated system (Kumar, 2013). This strategy is used for making the field observations of the two case studies. The researcher created a note taking template based on the POEMS 4 categories. An observation was made of the environment (overall environmental and spatial characteristics, circulation, and distinct features), objects (things that support the daily tasks), message (message each firm and space communicated) and people (routine, modes of working, activity pattern, and space utilization by employees). The service category will be ignored for this purpose as it is irrelevant to the study. A description of overall context of place and people will be understood through the POEMS framework. The benefits seen of this methodology is it broadens the mindset, encourages comprehensiveness, gives focus to the process, helps understand the context and helps focuses on the details (Kumar, 2013).

**Questions for the Designer:** These questionnaires were developed based on Nussbaumer’s (2009) Evidence Based Design for Interior Designers. These questions gave an insight into the design intent.

1. How did you decide on the alternative workplace model with non-territorial workspace model? Was it cost or business driven?
2. Did you research the effectiveness of this model? What were your findings? How did you implement them in the new space?
3. What is the main concept for this space?
4. How was the spatial distribution and utilization determined?
5. What are the full gamut of spatial genre provided to the employees?
6. How effective do you think is this workplace?
7. How positively has this workplace contributed to overall employee satisfaction, productivity and engagement?
8. What are some of the strengths and weaknesses of this workplace and what opportunities can be provided in future to make it more effective?

**Interviews**

“The interview is a flexible and adaptable way of finding things out. The human use of language is fascinating both as a behavior in its own right, and for the virtually unique window that it opens on what lies behind our actions.” (Robson, 2002, p.272). Interviews become a powerful tool to understand the human actions. Interviews can be structured, semi-structured and unstructured (Fontana & Frey, 1994; Robson, 2002). Yin (1994), identifies three key form of interviews, they are open ended nature, focused and formal surveys. Open ended nature interviews ask key respondents for facts and opinions on a given issues and events. Focused interviews are usually intense for a short period of time- for example an hour. Formal surveys are more highly structured and usually have pre-determined questions. Both open ended and formal surveys were adopted for this study.

**In-Depth, Open-Ended Interviews:** Initial in-depth interviews were designed as informal and open ended nature with one key management personnel and senior interior designer not involved in the design process. This was considered most appropriate approach for revealing the intent behind adopting this design strategy and also to understand perception of their and their employees’ experience of their physical work environment. The interviews were conducted in the case site of firm A and B. This provided them with a familiar context- one in which they were more likely to remember the details of their experiences. Before conducting the interviews the matters of participant’s freedom to withdraw and confidentiality of information were informed to each participants. Informed consent documents for observation and in-depth interview are included in Appendix C.
The interview was structured in three parts- initial, primary and secondary questions.

The three stages of interview format is as follows:

*Initial Questions:* Please give me a little bit of your information- such as position, role of your work, general work pattern and work tasks. The purpose of this initial question was to understand the background of each interviewee and to induce their various experiences in the workplace rather than the design of the workplace only.

*Primary Questions:* The research questions inquired in this study were:

*What spatial characteristics in a non-territorial alternate workplace make them effective workplaces?*

*Do these spatial characteristics contributed positively to employees’ engagement, satisfaction and retention?*

This led to the following primary questions:

1. Why was the alternate workplace model with unassigned workspace chosen for this new space? Was it cost driven or business driven?

2. Is a full gamut of spatial genres— from focus rooms to collaborations zones— provided for all employees? Are any utilized to their full potential or underutilized?

3. How does the design of the office impact opportunities for effective collaboration?

4. How does the design of the office impact opportunities for effective individual work?

5. What design and spatial elements of the office provide opportunities for learning for the employees?

6. What design and spatial elements of the office provide culture of trust for the employees?

7. What design and spatial element of the office provide autonomy for the employees?
8. Has the new design led to better employee engagement, satisfaction and retention?

*Secondary Questions:* The following secondary questions that supported the primary questions were further discussed in depth:

1. What is the overall physical health level of your workforce? Have you seen it improve in the new space?
2. Are mental-health problems (stress, anxiety, etc.) an issue among employees? Have you seen it improve in the new space?
3. What are attendance and absenteeism rates (as related to the physical environment or consequences of ambient conditions and workstations) in this new space? Has the employee time needed to work at home (versus working at the office) ratio gone up or down in this new space?
4. Do you find the employees more engaged in their work and with each other in this new space?
5. How high is employee satisfaction overall?
6. What are employee retention and turnover rates in the new space?
7. Do you frequently have to mediate disagreements between employees? Do you field many complaints about interpersonal interactions (for instance loud coworkers)?
8. How profitable has the organization been since the re-design/relocation? How much growth has the company experienced in that same period?

At the end of the interview, the question- ‘do you have any comments about your workplace design’ was asked. The length of each interview varied from 45 minutes to one hour. These interviews were conversational and informal with the view to initiating as natural response as possible. The focus of these in-depth questions was to understand the
contribution of spatial attributes to the three categories of effectiveness (opportunities of learning, autonomy and culture of trust) selected for this research and how this leads to the outcomes of effectiveness: work satisfaction, employee engagement and retention (http://www.familiesandwork.org).

**Quantitative Research Methodology**

The main focus of this study is to understand the effectiveness of alternative workplaces with non-territorial workspace through employees’ everyday experience. This research further investigates if effective workplaces leads to increase in employees’ productivity, satisfaction, engagement with work and peers and retention. This research obtained themes and specific statements from the participants in an initial qualitative data collection. In the next phase, these statements as specific items and themes for scale as well as other survey instruments from Families and Work Institute (FWI), Work Design Questionnaire (WDQ) and Interior design professional organizations were used to create a survey instrument that is grounded in the views of the participants. This survey was send to all the employees of both the corporations to be completed in seven business days.

Formal surveys are more highly structured and usually have pre-determined questions (Yin, 1994). Survey, is one of the instrument for quantitative research methodology. It provides a quantitative or numeric description of trends, attitudes, or opinions of the population by studying a sample of that population. From the sample results, the researcher generalizes or makes claims about the population (Creswell, 2003). The employees’ of both firm A and B were asked to complete an online questionnaire (see Appendix E). The Questionnaire consisted of four parts: 1) demographic information, 2) overall work environment, 3) effectiveness of workplace and 4) opinion about the non-territorial
workspace and one open-ended question about the effectiveness of the workplace. A questionnaire asked the subject’s demographics, such as gender, age, number of years he or she has worked in the firm.

**Design of the Questionnaire:** Several questionnaires and surveys from various sources were researched to develop this formal survey/questionnaire. Family and Work Institute categorizes six components of an effective workplace. As mentioned earlier they are: opportunities for learning, supervisor support for work success, autonomy, culture of trust, work-life fit and satisfaction with earnings, benefits and opportunities for advancement. When Work Works is a nationwide initiative which brings research on workplace effectiveness and flexibility into community and business practice. It is a project of Families and Work Institute (FWI) and the Society for Human Resource Management (SHRM). Since its inception in 2003, When Work Works has partnered with an ever-expanding cohort of communities from around the country to: share rigorous research and employer best practices on workplace effectiveness and flexibility; inspire local employers to create more flexible and effective workplaces to benefit both business and employees; and recognize exemplary employers through the When Work Works Award and local community events. All their surveys were studied but the focus was primarily on management, operations and policies. Author didn’t find any relationship between spatial attributes and workplace effectiveness.

Work Design Questionnaire (WDQ) was developed by Morgeson, F. P., & Humphrey, S. E. in 2006 to learn more about the characteristics of different jobs. It has three main characteristics: the motivational, the social, and the contextual characteristics, and under three characteristic categories, 76 questions were developed (Morgeson & Humphrey, 2006). To be specific, the motivational characteristics cover ten different concepts
(autonomy, information processing, problem solving, skill variety, task variety, specialization, significance, task identity, feedback from job, and task simplicity); the social characteristics cover four concepts (interdependence, interaction outside organization, feedback from others, and social support); contextual characteristics cover four features (ergonomics, physical demands, work conditions, and equipment use) (Morgeson & Humphrey, 2006). From the work context category, under the subcategory of Ergonomics, two questions were used.

Other surveys studied were from report and white paper published by IIDA and ASID. IIDA held its 18th roundtable with industry professionals involved workplace design and strategy in Chicago in 2015. Thirty members of the interior design community assembled over a weekend in January to parse the phenomenon of well-being in the workplace, a timely and multifaceted subject with myriad implications for manufacturers and practitioner’s alike (iida.org). They came up with the workplace well-being index which included a set of questions for employees and employers. The questions focused on work environment characteristic to holistic well-being of the employees. ASID published a white paper on productive workplaces, based on the research they had conducted on office productivity in 1998. The purpose of the research project was to identify overall factors that help improve office productivity, as well as specific ways that interior design helps create a more productive workplace (www.asid.org). It had several questionnaires which can be provided to the employees and employers to understand their work environment and relationship of environment and productivity. Several questions were borrowed from the report and white paper for the overall work environment section in an alternate workplace model.
The survey questions were broken into four categories. Category 1, focused on the demographic information, Category 2 focused on type of work environment and whether it aligns with all the strategies of alternate work environment. Category 3 focused on understanding how effective this workplace is with some open ended questions and Category 4 was aimed to learn their opinion about the non-territorial workspace. The majority of questions for this questionnaire used a five point Likert-type scale to record the participants’ responses, using a scale of “1” as strongly disagree to “5” as strongly agree with “3” as neither agree nor disagree. In the end the employees were encouraged to leave any additional comments they have about the effectiveness of the workplace. This is very open ended and the results will be coded later. See Appendix E for the survey questionnaire.

An email (see Appendix D) was sent to the primary contact of both Firm A and Firm B, to be forwarded to all the employees at that office location. The email included the details of the study with the links to the online survey. Detailed step-by-step instructions were given to be followed in order to participate in the study. Seven working days were allotted to complete this online survey. The survey platform used is Qualtrics. Qualtrics and all other Qualtrics product or service names are registered trademarks or trademarks of Qualtrics, Provo, UT, USA. http://www.qualtrics.com.

Analysis of Data

This section describes how data were deconstructed and reorganized to provide an understanding of contribution of spatial attributes to the effective workplace and resultant behavioral outcomes. Strauss and Corbin (1990) describe data analysis from a grounded theory perspective as the process of breaking down, conceptualizing and putting back together data in new ways to develop a different understanding of phenomena. There are three coding
procedures outlined by Strauss and Corbin: open coding, axial coding and selective coding. Strauss and Corbin (1998) state that the purpose of open coding is to begin the process of breaking down the data into concepts or representations of object, incident, events, behavioral actions, thoughts, ideas, and meanings. They propose that axial coding is “to begin the process of reassembling data that were fractured during open coding” (Straus & Corbin, 1998, p.124). Hence, the analysis begins by grouping the categories into main and subcategories. Selective coding is the process of integrating and refining the categories (Strauss and Corbin, 1998).

Further the survey results will also be discussed. First the demographic information of each firm will be discussed followed by mean, variance and standard deviation of the categories of effectiveness and the outcomes like productivity, satisfaction, engagement and retention. This survey report will expand and assist in interpretation of the qualitative findings. The open ended questions asked about the relationship of space and categories of effectiveness will be assessed and mapped on Figure 14 (discussed in detail below). The findings of spatial attributes from the in-depth interviews will be integrated with these open ended questions asked on survey during the interpretive phase.

The goal of this step is to develop an overarching theoretical scheme for integrating the categories and for describing the employee’s experiences and attitudes of their work environments from various perspectives. The method implemented for the data analysis is open coding, axial coding, and selective coding.

First step of the data analysis is open coding. The three categories of effectiveness of the workplace taken into consideration for this study were: opportunities of learning, autonomy and culture of trust. The attributes of spaces were explored in this study and need to be coded and aligned with respect to the categories of effectiveness. All the open ended interview
answers were thoroughly studied to get a general sense and then broken down into phrases and sentences representing the main idea. After studying the similarities and differences they were arranged into similar groups and main ideas of space like privacy, access etc. will be derived from them. This will help code and arrive at the spatial attributes for this study. Table 3, indicates how these will be deconstructed.

Table 3. Coding Spatial Attributes

<table>
<thead>
<tr>
<th>SPATIAL CHARACTERISTIC CODES OR CATEGORIES</th>
<th>TRANSCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>Example:</td>
</tr>
</tbody>
</table>

Now the spatial attributes and behavioral actions need to be coded with respect to the categories effectiveness. In this step the spatial attribute are aligned with respect to the work effectiveness. Further, a relationship between effectiveness, spatial attributes and behavioral outcomes is established. Figure 13 and Figure 14, talks about how this will be done. Both open ended questions from in-depth questionnaires and surveys were used to arrive at this.

![Diagram](image_url)

Figure 13. Establishing a relationship between effectiveness and spatial attributes
The categories will be further filtered based on the employee surveys to select those relating to each of the category of effectiveness. The primary goal of this step of analysis is to develop an overarching theoretical scheme for integrating categories and for describing the employees’ experiences of their work environment from the various perspectives. In this analytical step the main categories and subcategories are examined for their commonality and the results are presented in a tabular form.

Table 4. Theoretical Scheme for Workplace Effectiveness in an Alternate Work Environment with 100% Non-Territorial Workspace

<table>
<thead>
<tr>
<th>CATEGORIES OF EFFECTIVENESS</th>
<th>SPATIAL ATTRIBUTES</th>
<th>EMPLOYEE ATTITUDES (DEFINED AS SATISFACTION, ENGAGEMENT AND RETENTION FOR THIS STUDY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunities for Learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomy</td>
<td></td>
<td></td>
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<tr>
<td>Culture of Trust</td>
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<tr>
<td>Flexibility</td>
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</table>
Summary

This chapter describes how grounded theory one of the strategies of qualitative methodology and case study method were implemented for this study. It commences by highlighting the relevance of the methodology to the aims and intention of the study. Further data collection and analysis in adherence with the tenets of the methodology, the ethical standards for research involving humans, and the rigor and quality guidelines for qualitative research is discussed. The results will be discussed in the following chapter.
CHAPTER 4. RESULTS AND DISCUSSION

Overview of Data Analysis

The purpose of this thesis is to understand the contribution of spatial attributes to the effectiveness of alternative workplace strategy with non-territorial workspaces through employees’ everyday experience. The observation of two case studies were made for an hour at different time intervals for three consecutive days. POEMS, an observational research framework developed by Kumar (2013) was utilized for analysis of environment and activities. Informed by grounded theory, one of the instruments of qualitative research methodology, the data were collected from ten employees of two different case studies. This was followed by a survey (an instrument of quantitative research methodology), which was send to total ninety-five employees. The data gathered from the survey will assist in interpretation of the qualitative findings.

The observation results of the two firms will be discussed first. The primary focus of this study is to explore phenomena of effectiveness of the non-territorial workspaces in alternative workplace. Strauss and Corbin (1990) describe data analysis from a grounded theory perspective as the process of breaking down, conceptualizing and putting back together data in new ways to develop a different understanding of phenomena. There are three coding procedures outlined by Strauss and Corbin: open coding, axial coding and selective coding that were utilized to break down the data collected from the in-depth interviews. The quantitative data gathered from the survey is integrated with the qualitative findings. Integrating the data from two methods help researcher will gain broader perspectives on this phenomena.
Results of Observations

Observations of the two case studies were made for the total of three hours (one in morning, one in afternoon and one late afternoon) on three consecutive days. These observations helped gain firsthand experience with participants and record information as it is revealed. The POEMS framework, an observational research framework developed by Kumar in 2013, was utilized to study the space, space utilization and activity pattern. The five elements of POEMS framework are: People, Objects, Environment, Messages, and Services. An observation was made of the environment (overall layout, space utilization, circulation and distinct features), objects (furniture in objective and relational manner), people (space usage, utilization, activity pattern and palette of posture), and the message (message each firm and space communicated) in that order. The services element of the framework was ignored as it is irrelevant to the study. Observation made based on this framework, helped researcher understand the context of the alternative workplace strategy with 100% non-territorial spaces and key aspects like workplace modes, space types, space type utilization etc.

Environment: Alternate Workplaces are typically ‘go to spaces’ used for work and distributed throughout the office environment. They are generally used by individuals for concentration activities, project teams for collaboration activities, and as connection spaces for informal sharing or social activities (Knoll, 2013). Traditionally, Alternate Workplaces are associated with conference rooms, meeting rooms, training rooms, resource rooms, and libraries. Today, these places are more likely to be referred to as enclaves, hives, hubs, huddles, hotels, pods, team rooms, focus-booths, scrum rooms, and more (Knoll, 2013; Langhoff, 2007; New South Wales Government Workplace Guidelines, 2005; Steelcase,
Since, these two offices were designed on the model of alternative workplace, the employees undertake their work not at the workstation tasks in a wide variety of work setting inside the office like project rooms, huddle rooms, café, living room etc. As described previously, in these two work environment, the individual employee has no dedicated personally assigned office, workstation or desk.

The main environmental characteristic of the two firms included:

- Open designation of use where an available workstation is selected that best meets the requirements of the employees at the time required.
- Non-dedicated workspace where workstations are not assigned.
- Variety of spaces: like quiet rooms to café to breakout rooms (huddle, project rooms) are provided in each firm for use.
- Communal ownership of the facility
- Technology- One of the important feature is the white noise machine which maffles the office noises so that the workspace is quiet enough for people to be able to concentrate. In addition all employees have a headset to allow for hands-free talking. When employees log on to their computers, their laptops and phone numbers follow them.

The main spatial characteristic of the two firms included:

- Open plan, with no formal barriers or physical screens. Figure 15 and 16 show the floor plan of both the spaces.
• Workstations configuration was in rows (benching style), two groups of workstations were organized in both the firms’ and they were positioned with one side near the main traffic flow and other side near the windows. They had 8 inch panel separating them. Every workstation was equipped with two monitors and
docking station. Figure 17 and 18 show the workstation configuration of the two firms.

- The huddle rooms, project rooms, phone booths, variety of lounge furniture were positioned as clearly defined areas within the larger work area. The enclosed rooms can be checked out for 3 hours by the employees and the lounge furniture can be used anytime. The huddle and project rooms had transparent boundaries but were acoustically sealed (see figure 19 & 20).
Circulation- Workstations are positioned on one side of the main circulation path in both firms for easy access. On the other side of the main circulation aisle is writable and pinable vertical surfaces for display of work. The main circulation leads easily to all the prominent destinations and is fluid and efficient. See Figure 21 and 22 for the main circulation pattern.

Figure 21. Circulation Path, Firm A Main Path indicated with arrow

Figure 22. Circulation Path, Firm B Main Path indicated with arrow
- Material Library is positioned at a quiet corner at both the offices for focus work and organizing meetings with the representatives. Refer to Figure 15 and 16 for the location of material library.
- Copy/Print/Plotter spaces are provided for all the printing needs. Refer to Figure 15 and 16 for the location of material library.
- Lockers are provided for the employees for storage of their personal items. Refer to Figure 15 and 16 for the location of material library.
- Variety of collaboration and Interaction nodes were strategically placed throughout rather than clubbed together. See Figure 23 & 24 indicate various focus, collaborative, social and knowledge sharing zones for Firm A and B.

Figure 23. Location of focus, learning/sharing, collaboration, socializing zones in Firm A
At both the firms the café was considered the hospitality space and was located at the front.

Both firms had a big conference enclosed space.

Other space defining characteristic include open floor plan, high level of transparency, seamless boundaries between the different spaces with no opaque edges.

The space offers variety and choice to the user, to work where they would like to today, except the restriction that enclosed spaces like huddle and enclave spaces that can be checked out for not more than three hours.

**Objects** included in the objects/furniture/accessories at workplace that support daily tasks to be conducted:

- Workstation- benching style
- Variety of furniture (lounge, conference, café style)
Personal and project cubbies were located at Firm B, see figure 25.

Project Drawers/Storage were located at both the offices.

![Figure 25. Wall dedicated to project and personal cubbies along with pin up space- Firm B](image)

**People:** the people present in the space are employees. Their daily routine, work modes, utilization of space and activity analysis in relation to the space is discussed in this section.

**Normal Daily Routine:** In terms of the work practices the normal daily routine is as follows:

- Arriving at the work area
- Choosing a seat
- Collecting personal items
- Setting the workstation
- Carry out the tasks
- Packing everything
- Cleaning
- Returning to lockers
- Departing the workplace.
Work Mode: Work mode is a combination of observed work activities and the number of people performing the activities (Gensler, 2008). In-depth interview with the two designers from Firm A and B, identified four primary work modes in work environment. They are; 

*collaborate and interact*: includes both virtual and in-person collaboration for groups, and virtual collaboration (phone, video conference) for individuals; *

*focus*: one person working alone, either on the computer, reading or writing; *

*socialize*: a group of two or more eating or hanging out and *

*learn*: knowledge sharing, either via listening, looking at projects, collaborating or talking to employees. Besides the workstations and focus rooms at the two firms, there are ‘go to’ spaces for employees’ like lounge furniture grouping, café, phone booths, huddle rooms etc., which supports these work modes and provide a choice to the employees to carry their tasks efficiently. The different types of spaces are indicated in Figure 15, 16, 23 and 24.

Utilization of Space: Observations of the two case studies were made for the total of 3 hours (an hour each in morning, mid-morning and late afternoon) on three consecutive days. This section focuses on the number of people utilizing key spaces for the time duration the spaces were observed. The average sharing ratio of workstation/individual focus space is 1.2 to 1 (people to seats). The utilization study for Firm A, revealed that 58% of employee workstations/focus areas were occupied during the morning, and the percentage of utilization increased in mid-morning and late afternoon. Firm B revealed similar patterns. The huddle rooms and red conference room was utilized 100% in morning and mid-morning, but the utilization declined in afternoon. Firm B, showed contradictory results, with low utilization of huddle rooms but the utilization increased to 100% in mid-morning and late afternoon. On the three occasions when the spaces were observed, the big conference room were not
utilized at all. Café was consistently used and range varied between 6%-11% for firm A and 11%-33% for firm B.

The other type of seating such as broody, living room space, reclining low chairs at Firm A were not utilized except the Brody cluster was utilized 50% consistently when observations were made. Firm B indicated that high top seats (high top tables with two bar height chairs around) were utilized to their maximum capacity, however the other lounge pieces were not utilized that much.

Table 5 and 6, further indicate the space utilization for both the firms and Appendix G and H describes the space utilization diagrammatically.

Table 5. Space Utilization Firm A

<table>
<thead>
<tr>
<th>SPACES</th>
<th>UTILIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8:30 to 9:30</td>
</tr>
<tr>
<td>Focus (workstations + focus room)</td>
<td>58%</td>
</tr>
<tr>
<td>Collaboration (Huddle Rooms)</td>
<td>100%</td>
</tr>
<tr>
<td>Socialization</td>
<td>33%</td>
</tr>
<tr>
<td>Broody- Phone booth</td>
<td>50%</td>
</tr>
</tbody>
</table>

Table 6. Space Utilization Firm B

<table>
<thead>
<tr>
<th>SPACES</th>
<th>UTILIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8:30 to 9:30</td>
</tr>
<tr>
<td>Focus (workstations + focus room)</td>
<td>53%</td>
</tr>
<tr>
<td>Collaboration (Huddle Rooms)</td>
<td>33%</td>
</tr>
<tr>
<td>Socialization</td>
<td>25%</td>
</tr>
<tr>
<td>Other Miscellaneous seats used for focus and collaboration</td>
<td>18%</td>
</tr>
</tbody>
</table>
Activity Analysis: Activity implies, what is happening in a space. Activities responded to the four work modes identified by the designers of two firms. Activity is a fundamental characteristic of the fabric of work, and is completely integral to the four work modes identified by the designers of the two firms, i.e. focus, collaborate, learn and socialize. This section focuses on the how many employees are involved in what activity for the time frame observed while they were in the office. The table below indicates percentage of employees involved in different modes of work. The researcher was unable to quantify the learning/knowledge sharing work mode as learning happened at all the places, when they were interacting with each other in café, working at the workstation and listening to others or listening over meetings and/or gathering around the pin up area. The results indicate that mean of focused activities was 59%, while collaboration activities were 26% (mean) and socialization was 9% (mean) as recorded over three different time periods for Firm A. The usage of broody was categorized under learning as they were used for meetings, virtual or one on one. For firm B, the results indicate that mean of focused activities was 60%, while collaboration activities was 28% and socialization was 12% as recorded over three different time periods. Figure 26 and 27 indicates pie charts for the activity distribution and the activity analysis diagrams and graphs are shown in Appendix G and H.

![Pie chart](image)

Figure 26. Activity Pattern in Firm A
Figure 27. Activity Pattern in Firm B

**Message:** As told the designer of the two firms and observed by the researcher, the design and spatial layout represents fluidity and flexibility offering variety and choice. The spaces should truly represent how employees work in the space. This was the underlying message which was conveyed.

**Qualitative and Quantitative Data Analysis**

Extensive qualitative data was collected through observations and in-depth interviews with five participants at each firm. The interview questions focused on the contribution of spatial attributes to the effectiveness of the alternative workplace strategy with 100% non-territorial workspace and how it influences the attitude of the employees. These interviews were analyzed through the extraction of codes (words and phrases) to produce themes. It is expected that in qualitative research that the investigator/researcher includes some of their own views in their interpretation of the findings because they can never completely remove themselves from interpretation and personal experience. The researcher is a professional in the field of Interior Design and has extensive experience as a practicing interior designer and interior design educator.
Sequential exploratory strategy is characterized by an initial phase of qualitative data collection and analysis, which is followed by a phase of quantitative data collection and analysis. The priority is given to the qualitative aspect of the study (Creswell, 2003). The finding of the two phases are then integrated during the interpretation phase. The primary focus of this study is to explore phenomena of effectiveness of the non-territorial workspaces in alternative workplace. The qualitative findings will be analyzed and coded first. At the second stage, the results of quantitative data gathered from the survey will be discussed. This design is appropriate to use when testing elements an emergent theory resulting from qualitative phase and that it can be used to generalize quantitative findings to different samples. Utilizing the two methods, the researcher will gain broader perspectives as a result of using the different methods as opposed to used predominantly one.

**Stage 1: Analysis of Qualitative Data**

**Step1: Emergence of Spatial Strategies, Patterns and Elements**

First step of the data analysis is open coding. The three categories of effectiveness of the workplace taken into consideration for this study were: opportunities of learning, autonomy and culture of trust. As per the Family and Work Institute, flexibility is also one of the category for effective workplaces. Hence, flexibility is also taken into account as one of the categories of effectiveness for this research. The attributes of spaces were explored in this study and need to be coded and aligned with respect to the categories of effectiveness. There were total ten interviews conducted at firm A and B. Each participant was asked primary questions focusing on the effectiveness of alternative workplace strategy and non-territorial workspace and how the design promotes the two main modes of working, collaboration and focus. The questions further focused on contribution of spatial elements to each category of effectiveness. This was
followed by questions of their perception of the impact of this new space on employees’
attitude and behavior. The designers of the firms were asked these questions and also, why they
chose this strategy and what was the main idea/concept behind the design. The interviews were
completed in two week time period and each interview took approximately 45 minutes to an
hour.

All the open ended interview answers were thoroughly studied to get a general sense
and then broken down into phrases and sentences representing the main idea. After studying
the similarities and differences they were arranged into similar groups and main ideas of space.
Based on further analysis of these, the researcher was able to constitute them into three main
categories: spatial strategy, spatial pattern and spatial concept. Table 7, explains these
categories in detail. This table was further refined and space types were derived from them as
indicated parenthesis.

Table 7. Spatial Strategy, Patterns and Concepts codified from the Interviews:

<table>
<thead>
<tr>
<th>CATEGORIES &amp; SPACE TYPES</th>
<th>TRANSCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPATIAL STRATEGY</td>
<td></td>
</tr>
<tr>
<td>Alternative Workplace</td>
<td>The interviewees concurred that this is the model they preach to the clients as we understand how people work. They want mobility and flexibility in the environment rather than being always at their desks. Also, their work demands collaboration all the time. Hence, this strategy lends itself to both. (Effectiveness: flexibility, culture of trust, engagement with others)</td>
</tr>
</tbody>
</table>

(Choice and variety of spaces for focus work and collaboration, mobility and flexibility)
| Non-Territorial Workspace (collaboration, mobility, flexibility, access) | It was business and operation driven. Our old space failed to bring people together naturally and there was a lack of collaboration and we were kind of embarrassed of our new firm. Moreover we noticed that not all desks are occupied all the time. We also sell this model to the clients all the time and we talk about the benefits of it so why not implement it and so that this space starts serving as a live model and we can not only talk but show our clients how work is done. We wanted it to be an authentic space, authentic to who we are and how we operate and this captures us and gives our employees an empowerment and choice rather than ‘a seat’. |
| Threats: lack of privacy and control, and loss of identity | (Effectiveness: flexibility, culture of trust, autonomy Threats: Lack of engagement with their work and satisfaction) |

| CATEGORIES & SPACE TYPES | TRANSCRIPTION |
| SPATIAL PATTERN |

| Community (space types- open meeting and conferencing, café space, library, color, texture, vibrancy in the environment) | We created is open kitchen or café as an arrival point to represent that you are welcome in the space like you are at home and this triggers conversations. Also, the café opens into the big conference room with garage doors, which can bleed into the café. We host so many programs for our employees like movie night, happy hours etc. |
| (Effectiveness: engagement with colleagues, flexibility, culture of trust, opportunities to learn) |

| Collaboration (variety of space to collaborate, equipped with white boards, surfaces to pin up and technology is embedded) | (Effectiveness: engagement with colleagues, flexibility, culture of trust, opportunities to learn) |

| Concentration (enclosed spaces, controls- mechanical, lighting and acoustics) | Now with greater mobility, the individuals are provided with a variety of choices to select the kind of settings that best suits the changing activities and needs at the various times- rather than being limited by working in an assigned, single purpose space which underserves most of their needs most of the time. |
| (Effectiveness: engagement with their work and satisfaction) |

| CATEGORIES & SPACE TYPES | TRANSCRIPTION |
| SPATIAL CONCEPT |
Table 7. (continued)

| Access | If I have to do a heat map of my step, every ten step is different space where I can either continue a focused task or interact with colleagues or collaborate. We strived to provide this easy access in our office. This provides both *freedom* to use any space as well as *flexibility*.  
The location of project filing giving an access to all the projects to all, rather than bothering someone at their office or workstation about the documents.  
*Effectiveness: flexibility, collaboration, autonomy, engagement with colleagues* |
|---|---|
| **Transparency** | We can sit next to our project team and are able to crank out the projects fast as there is a *seamless and fluid collaboration*. *Transparency* has led to an open culture where people have visual access to the entire workplace, work and their coworkers. This has promoted *trust* in their workplace and people they are working with.  
*Effectiveness: flexibility, trust, effective collaboration, engagement with colleagues* |
| **Boundaries** | We wanted to keep the structure raw, and the objects to fulfill functional aspects and just one space flow into the next.  
*Effectiveness: flexibility, trust, effective collaboration, opportunities to learn, engagement with colleagues* |
| **Surfaces** | The projects and inspiration behind the projects are constantly visible through the tackable and writable vertical surfaces. This is providing an *opportunities to learn* and promoting seamless *interaction and collaboration*.  
*Effectiveness: flexibility, trust, opportunities to learn, engagement with work and satisfaction* |
| **Positioning** | We strategically located these one of the huddle room at the far end with two opaque surfaces to provide some *quietness* and *privacy* if you need it for focus work or private conversation.  
Three of our private offices are around corner at the farther end so that confidential phone calls can be taken and meeting which need privacy can be conducted without disruption  
*Effectiveness: flexibility, effective for focus work, privacy, satisfaction* |
| **(clarity of primary/main path, legibility, central filing system)** |  |
| **(open designation of workspaces and visual connectivity, central filing and locker locations)** |  |
| **(furnishing, finishes, edges)** |  |
| **(pin up space, white boards, horizontal surfaces for work)** |  |
Table 7. (continued)

| **Juxtaposition**  
| *(open office plan, flexible objects, juxtaposing private and active spaces throughout the space )* | Individuals can now turn in their chair to speak to colleague or walk few paces to see what their other colleagues on the same team is doing, it seems like an ideal relationship. If person changes from group to individual task, there is sufficient flexibility to meet this new requirement: a different workspace, a different room, some furniture moving and the association is quickly transformed to privacy.  
| *(Effectiveness: culture of trust, engagement and autonomy)* |

| **Flattened Hierarchy**  
| *(open floor plan, use of glass, no designated rooms, variety of spaces)* | I am knowing other people in my workplace and I am gaining skills and experience of everyone rather than just one person. Other day I was sitting next to my architecture colleague while in the old office we were segregated by disciplines. I learnt all about curtain wall by listening to his conversation. I am not only making new friends but learning a lot.  
| *(Effectiveness: culture of trust and engagement)* |

| **Control**  
| *(different types of work areas, amenities, hard boundaries, acoustics)* | There is no overall supervision here. You can sit anywhere and we know you are getting work done. This is the level of trust and openness we want to promote by providing variety. Moreover, we want an employee to be in control of their setting and we know they will be productive then.  
| *(Effectiveness: flexibility, satisfaction, autonomy  
| Threat: privacy and identity)* |

| **Variety & Choice**  
| *(variety of seating, areas and zones)* | The employees have a variety of spaces to choose from in this office. They are now more aware of their surroundings and work the firm is involved in.  

This is not my personal office, this firm’s office, they own it, and we don’t. The firm has understood how you work and provided places to sit, stand, interact, collaborate, focus, relax and all these variety of spaces are accessible to all. This provides employees a freedom to choose.  

There are total 62 employees, 50 workstations and 2 focus/flex spaces and there are 190 total seats. There are project rooms, huddle rooms and there are also big conference rooms provided along with variety of lounge furniture/seating, there is a big conference room and a café. Employees like the choice which is provided to them. This has not only given them autonomy but builds a culture of trust as employees are assured the management is promoting their workstyle and trusting where they work in the space.  
| *(Effectiveness: flexibility, autonomy and opportunities to learn)* |
Table 7. (continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Privacy</strong></td>
<td>The spatial concept of privacy is sometime compromised in an open transparent environment especially with no dedicated workspace. However, the representatives from both the firms said that this strategy is about providing a variety of options to the employees so that they can chose where they would like to work. The white noise machine which muffles the office noises so that the workspace is quiet enough for people to be able to concentrate is utilized in both the firms. There are two focused rooms in both firms and some quiet spaces which help employees carry their work.</td>
</tr>
<tr>
<td><strong>Threats:</strong> Visual and Acoustics</td>
<td>(Effectiveness: Threats: autonomy, engagement and satisfaction)</td>
</tr>
<tr>
<td><strong>Personalization</strong></td>
<td>There is so much diversity of work setting providing variety and choice. The employees can create an individualized experience, tailored to how they work rather than a pictures in the frame on the desk. It is like empowering people. People are personalizing the office space with their work and inspiration behind their work. This should give a feeling of pride and sense of belonging that I am part of this family- this firm.</td>
</tr>
<tr>
<td><strong>Threats:</strong> Lack of Personal Identity</td>
<td>(Effectiveness: Threats: autonomy, identity and satisfaction)</td>
</tr>
</tbody>
</table>

**Content of the Categories as Transcribed from the Interviews:**

**Spatial Strategies**

**Alternative Workplace:** The employees undertake their work not at the workstation but in a wide variety of work setting inside the office like project rooms, huddle rooms, café, living room etc. As described previously, the individual employee has no dedicated personally assigned office, workstation or desk and the two firms offer variety of settings to conduct work. One of the interviewees from Firm A and Firm B said respectively:

Our old space was a cluttered chaos, collaboration was enforced and high panel workstations were not conducive to interaction. Past five years, there was a corporate cultural shift in the way we worked so we wanted the new office to reflect this. Hence, we chose alternate workplace model as it provides choice, variety and flexibility.

People don’t often like to work at one place, they like to move around and why not provide that variety to people, a fluid and flexible workplace. Also, we wanted an
environment where teams if needed can sit together and work rather than exchanging emails and IM.

Other interviewees concurred that this is the model they preach to the clients. The employees these days want mobility and flexibility in the environment rather than being always at their desks. Also, our work demands collaboration all the time. Hence, this strategy lends itself to both.

**Non-Territorial Workspace:** In a non-territorial workspace the employees don’t have a dedicated workspace but this setting offers mobility and flexibility to choose to work from any place in the office. This is what interviewees from Firm A and B said:

There were initial anxieties and fears related to the idea of ‘my space’, storage, technology from both the higher management and employees. The management said it is a great idea but not feasible but we started working out all the details and it became reality. We did a survey after 10 days of moving and employees were really liking this environment.

It was business and operation driven. Our old space failed to bring people together naturally and there was a lack of collaboration and we were kind of embarrassed of our new firm. Moreover we noticed that not all desks are occupied all the time. We also sell this model to the clients all the time and we talk about the benefits of it so why not implement it and so that this space starts serving as a live model and we can not only talk but show our clients how work is done. We wanted it to be an authentic space, authentic to who we are and how we operate and this captures us and gives our employees an empowerment and choice rather than ‘a seat’.

Some of the challenges seen with this strategy were storage of projects, their personal belongings and technology and its use. There is also a risk in creating a sense of anonymity among the employees as this model lacks the notion of ‘my space’. This is typically combatted by treating the whole space as their own. This space departs from the idea of standardization and uniformity to a stronger sense of identity for the individual. The nature of the entitled shifts from ownership to access: people are entitled to access to the space and equipment they need to get their work done.
Spatial Patterns

There were three spatial patterns which emerged from the interviews and observations:

**Community:** The workspace is designed with vibe and energy that attract people to gather thereby creating serendipitous collisions of individuals and their ideas. Firm A interviewee said:

We purposely chose bright paint colors, lively art (not incorporated at this point) and living room concept to encourage a vitality, leading to the conversation and socialization.

Firm B’s interview said that:

We created is open kitchen or café as an arrival point to represent that you are welcome in the space like you are at home and this triggers conversations. Also, the café opens into the big conference room with garage doors, which can bleed into the café. We host so many programs for our employees like movie night, happy hours etc.

This model does bring people close to each other, and foster them to interact with each other. The firms said that people interact with each other more and have lunch together and have started hosting more socials here.

**Collaboration:** The workspace is designed to support self-organizing teams working together in person, sometimes joined virtually by collaborators. All the interviewees agreed this pattern includes choices for teams to select either shared enclosed and shared open spaces for face to face interactions to group of various sizes.

**Concentration:** The workspace design must support individuals working alone quietly in presence of others. There should be an option where an individual may work in fully enclosed space for privacy or confidentially. Now with greater mobility, the individuals are provided with a variety of choices to select the kind of settings that best suits the changing activities and needs at the various times- rather than being limited by working in an assigned, single purpose space which underserves most of their needs most of the time.
Spatial Concepts

**Access:** The primary path is flanked with workstations on one side and communal spaces on the other side in firm A and firm B is has the pin up wall on one side and workstations and huddle room on other side. The clarity of the primary path leads to easy and direct access to all the spaces in the each office. Work areas are not bisected and all the collaboration zones have a clear access.

If I have to do a heat map of my step, every ten step is different space where I can either continue a focused task or interact with colleagues or collaborate. We strived to provide this easy access in our office. This provides both freedom to use any space as well as flexibility.

The location of project filing giving an access to all the projects to all, rather than bothering someone at their office or workstation about the documents. This has also saved printing, as employees have started saving everything electronically now.

This has led to autonomy and flexibility. The employees can easily visually scan the entire office and see who is where and where would they like to be stationed for the day.

**Transparency:** Open communication is enhanced due to the transparency and open designation of the workspace, where the employees are able to choose their own seat in turn allowing employees to sit with the coworkers working on common projects. This facilitation of communication was understood to increase the work efficiency. During the interview one of the project manager mentioned:

We can sit next to our project team and are able to crank out the projects fast as there is a seamless and fluid collaboration now rather than wasting time over technology to communicate and trouble shoot. The transparency has also lead to open communication, visibility of work, and camaraderie.

Transparency has led to an open culture where people have visual access to the entire workplace, work and their coworkers. This has promoted trust in their workplace and people they are working with. Now they talk to each other more and the overall camaraderie at workplace has increased.
Hence the spatial element of transparency has led to seamless collaboration, flexibility and culture of trust and also enhanced work efficiency. These were some of the emerging themes which came up from the interviews. The space types or strategies as discussed which promote transparency are: visual access and open designation of workspace.

**Boundaries:** Boundaries help determine how places are physically related to one another. In both the firms, to create an effective place based on this model the boundaries between spaces were seamless. The spaces were separated public vs private with change in material or transparent edges like glass. The open access and this transparency created by open seamless edges fosters collaboration and culture of trust in the two offices.

Firm A interviewee: We wanted to keep the structure raw, and the objects to fulfill functional aspects and just one want to see the space flow into the next.

**Surfaces:** Interviewees from both the firms confirmed that the vertical tackable surface promotes knowledge sharing. Employees are encouraged to pin up their drawings related to project and there are conversations around it.

The projects and inspiration behind the projects are constantly visible through the tackable and writable vertical surfaces. This is providing an opportunities to learn and promoting seamless interaction and collaboration.

It was also noticed when the researcher was making observation that employees chose high tops and other agile seating with surface over the lounge seating. The horizontal surfaces are adequate to keep laptops and carry on the tasks. Hence, a good mix of surfaces to encourage collaboration, knowledge sharing and continue the focus is need to make the office palette effective.

**Positioning:** Although both the firms have an open office floor plan, direct confrontation, eye to eye is avoided by providing two monitor system and small panel between the workstations.
Some of the huddle rooms are located towards the back end of the office for more private conversation. Noisy machines, like plotter and printer in this case is zoned away from the work zones.

We strategically located these one of the huddle room at the far end with two opaque surfaces to provide some quietness and privacy if you need it for focus work or private conversation.

Three of our private offices are around corner at the farther end so that confidential phone calls can be taken and meeting which need privacy can be conducted without disruption. Strategic positioning of spaces like this and zoning the floor plan with active and passive areas give a sense of privacy and less disruption.

**Juxtaposition:** Open office plan ensures that individuals and group that need to be associated are in fact adjacent to each other. In large it is possible to make whatever juxtaposition is required. One of the interviewee from Firm A said:

Individuals can now turn in their chair to speak to colleague or walk few paces to see what their other colleagues on the same team is doing, it seems like an ideal relationship. If person changes from group to individual task, there is sufficient flexibility to meet this new requirement: a different workspace, a different room, some furniture moving and the association is quickly transformed to privacy.

Interviewees from Firm B had similar thoughts. Hence with the amount of flexibility the alternative workplace offers with unassigned seating, it is possible to make whatever juxtaposition – privacy or associations as needed to conduct a task. This leads to an effective work environment as not only provides sense of autonomy but a climate of respect and trust.

**Control:** As told by the interviewees of both the firms, the employees are able to express themselves in their particular workspaces. No two work areas are alike in both firms, hence an employee is provided with a choice and can control their work space based on their need to complete the task. Café or Kitchen is available to the employees all the time. Research
indicates that most people benefit from natural breaks from work about once every two hours, and such breaks are best of they are they are spontaneous (Duffy, 1992). As noted by one of the interviewees of firm A:

There is no overall supervision here. You can sit anywhere and we know you are getting work done. This is the level of trust and openness we want to promote by providing variety. Moreover, we want an employee to be in control of their setting and we know they will be productive then.

**Variety and Choice:** Employees are more productive when given multiple workspace options (focus, formal and informal collaboration, social interaction).

The employees have a variety of spaces to choose from in this office. They are now more aware of their surroundings and work the firm is involved in.

This is not my personal office, it’s firm’s office, they own it, and we don’t. The firm has understood how you work and provided places to sit, stand, interact, collaborate, focus, relax and all these variety of spaces are accessible to all. This provides employees a freedom to choose.

There are total 62 employees, 50 workstations and 2 focus/flex spaces and there are 190 total seats. There are project rooms, huddle rooms and there are also big conference rooms provided along with variety of lounge furniture/seating, there is a big conference room and a café. Employees like the choice which is provided to them. This has not only given them autonomy but builds a culture of trust as employees are assured the management is promoting their workstyle and trusting where they work in the space.

Hence, a design solution incorporating the right combination of space types, furnishings enhances choice. Both Firm A and Firm B provides variety of spaces to their employees. Also, both the firms provide this range to spaces to carry the focus work, to collaborate and to socialize. Also, variety and choice enables employees to choose their own seats providing opportunities to site with different colleagues every day. This enables the employees to get to know their fellow employees they would normally not interact with. This also provides an opportunity to learn new skills.
**Hierarchy:** This strategy has led to flattened hierarchy in the office environment. People don’t own any space, but can sit anywhere where they can get work done. The teams can be together now to get work accomplished seamlessly. This has also provided opportunities to learn new skills but seeing and listening.

I am knowing other people in my workplace and I am gaining skills and experience of everyone rather than just one person. Other day I was sitting next to my architecture colleague while in the old office we were segregated by disciplines. I learnt all about curtain wall by listening to his conversation. I am not only making new friends but learning a lot.

This was one of the comments from one of the interviewees at Firm A. Hence, this flattened hierarchy of making everything accessible to all has led to a more engaged work culture.

**Privacy:** The spatial concept of privacy is sometime compromised in an open transparent environment especially with no dedicated workspace. However, the representatives from both the firms said that this strategy is about providing a variety of options to the employees so that they can chose where they would like to work. The white noise machine muffles the office noises so that the workspace is quiet enough for people to be able to concentrate is utilized in both the firms. There are two focused rooms in both firms and some quiet spaces which help employees carry their work. The huddle rooms in Firm B are acoustically sealed and the noise doesn’t transmit. However the noise is an issue in Firm A with walls not going all the way upto the deck.

One of the interviewees also said that there is self-policing, if you are loud then go to phone booth or focus room to talk. Also you have a choice, if someone is loud, to not sit next to them.

**Personalization:** Employees generally tend to personalize their space through artifacts to make it their own. This is turn gives them a sense of identity and comfort. However there is a lack of
personalization as they don’t have their defined territory but every space is shared. This might give employees a lack of sense of identity and control. The interviewee of firm A responded to this by saying:

The employees might not have a space to put their artifacts and family pictures but sense of personalization comes from freedom of choice here. The entire space is very refreshing, inspiring now as it offers variety, choice and freedom. We want to come and work here. It is also clutter free. Also, the relationship are building more organically. People are closer to one another now. This is healthier than just having a picture of your family on frame at your dedicated desk. Moreover, you can put images on the computer as screen savers.

One more interviewee from Firm A said that there is a mind shift with this model. Employee shouldn’t think that their desk is their space, but this entire office is their space. They are free to work where they feel like.

Interviewee from firm B said:

There is so much diversity of work setting providing variety and choice. The employees can create an individualized experience, tailored to how they work rather than a pictures in the frame on the desk. It is like empowering people.

Another interviewee from the same firm added: People are personalizing the office space with their work and inspiration behind their work. This should give a feeling of pride and sense of belonging that I am part of this family- this firm.

To give a sense of personalization Firm B, has provided the personalized cubbies to each employee, where they can personalize. Their café is more like a open family kitchen concept, where people interact, talk, make meals together and socialize. This in a way personalize the space.

The loss of the ability to personalize your workstation or office, in this context, is replaced with much more powerful work tools and the opportunity to personalize your work not with family photos but with choices about how to use the office.
Step 2: Relationship between the Categories of Effectiveness and Spatial Strategies, Patterns and Elements:

The goal of step 1 was to derive workplace strategies, spatial patterns and concept based on the observations and in-depth interviews. These were then coded, the naming of the codes is quite broad in recognition of the complexity of the concepts, however, through categorization process these become more focused. These codes are highlighted in Table 7. As stated the goal of this research is to establish a framework for effectiveness for alternate, non-territorial workplaces. In order to do that the categories of work place strategy, spatial pattern and concept were filtered to select those relating to the four different categories of effectiveness- flexibility, opportunities to learn, culture of trust and autonomy. Table 8 summarizes this relationship. The primary goal of this step is to develop an overarching theoretical scheme for integrating the categories and describing the effectiveness of this environment in relationship to the spatial pattern and concept. The relationship between effectiveness and spatial attributes are highlighted in Table 8.

Table 8. Relationship between Effectiveness and Spatial Attributes

<table>
<thead>
<tr>
<th>CATEGORIES OF EFFECTIVENESS</th>
<th>WORKPLACE STRATEGY, SPATIAL PATTERN AND CONCEPTS</th>
<th>SPATIAL ATTRIBUTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunities to Learn</td>
<td>Surfaces, Transparency, Community, Positioning, Variety and Choice</td>
<td>Vertical Pinable surfaces, white boards, Employee Award wall, Employee Personalized wall, Presence of Media, different types of spaces to interact and collaborate, unassigned workspace</td>
</tr>
</tbody>
</table>
Table 8. (continued)

<table>
<thead>
<tr>
<th>Autonomy</th>
<th>Access, Control, Variety and Choice, Privacy, Personalization, Concentration, Juxtaposition, Control</th>
<th>Different types of seating, Open floor plan, technology, unassigned work space, different types of spaces to interact and collaborate, Controls such as mechanical, acoustics and lighting.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture of Trust</td>
<td>Positioning, transparency, Juxtaposition, Seamless boundaries, Flattened Hierarchy, Variety and Choice</td>
<td>Open Floor Plan, variety of seating, pinable and writable surfaces, no private offices, and various interaction nodes.</td>
</tr>
</tbody>
</table>

**Step 3: Relationship between the Categories of Effectiveness, Spatial strategies, Patterns and Elements and Employee Attitude**

Based on the 2008 National study of Changing Workforce data, the six categories of effectiveness were identified, all of which benefitted both employees and the organization. In the same study empirical relationship was established between these six workplace effectiveness and work related outcomes. The work related outcomes were, employee engagement, job satisfaction and turnover retention.

The result of effective workplace dimensions and work outcomes based on the survey are summarized in Table 9:

Table 9. Effective workplace dimensions significantly predicting work outcomes rank ordered by relative importance

<table>
<thead>
<tr>
<th>GREATER ENGAGEMENT</th>
<th>GREATER JOB SATISFACTION</th>
<th>GREATER PROBABILITY OF RETENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Climate of Respect</td>
<td>8. Work-Life Fit</td>
<td>7. Work-Life Fit</td>
</tr>
<tr>
<td>12. Supervisor Task Support</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
After careful study of this table and the in-depth interview the work outcomes were integrated with Table 10. The primary goal of this step of analysis is to develop an overarching theoretical scheme for integrating categories and for describing the employees’ experiences of their work environment from the various perspectives. In this analytical step the main categories and subcategories are examined for their commonality and the results are presented in a tabular form.

Table 10. Relationship between the Categories of Effectiveness, Spatial strategies, patterns and elements and Employee Attitude

<table>
<thead>
<tr>
<th>CATEGORIES OF EFFECTIVENESS</th>
<th>WORKPLACE STRATEGY SPATIAL PATTERN AND CONCEPTS</th>
<th>SPACE TYPES AND STRATEGIES</th>
<th>WORK OUTCOMES EMPLOYEES ATTITUDE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flexibility</strong></td>
<td>Alternate Workplace Model, Non-territorial workspace, Variety and Choice, Access, Transparency, Seamless boundaries, Control, Collaboration</td>
<td>Un-assigned workstations, Different types of office seating landscapes, Central Filing System, Open Floor Plan and its Legibility</td>
<td>Greater job satisfaction, Engagement, Greater probability of retention</td>
</tr>
<tr>
<td><strong>Opportunities to Learn</strong></td>
<td>Surfaces, Transparency, Community Positioning, Variety and Choice</td>
<td>Vertical Pinnable surfaces, white boards, Employee Award wall, Employee Personalized wall, Presence of Media, different types of spaces to interact and collaborate, unassigned workspace</td>
<td>Engagement, Greater job satisfaction, Greater probability of retention</td>
</tr>
<tr>
<td><strong>Autonomy</strong></td>
<td>Access, Control, Variety and Choice, Privacy, Personalization, Concentration, Juxtaposition, Control</td>
<td>Different types of seating, Open floor plan, technology, unassigned work space, different types of spaces to interact and collaborate</td>
<td>Engagement, Greater job satisfaction, Greater probability of retention</td>
</tr>
<tr>
<td><strong>Culture of Trust</strong></td>
<td>Positioning, transparency, Juxtaposition, Seamless boundaries, Flattened Hierarchy, Variety and Choice</td>
<td>Strategic locations, visual barriers, open floor plan, Open Floor Plan, variety of seating, pinnable and writable surfaces, no private offices, various interaction nodes</td>
<td>Greater job satisfaction, Engagement</td>
</tr>
</tbody>
</table>
Stage 2: Analysis of Quantitative Data

The survey was sent to all the employees at the two firms designed recently on the model of Alternative workplace Strategy with 100% non-territorial workspace. Of the thirty five employees, thirty employees participated in the survey at Firm A and of the sixty one employees at firm B participated in the survey and thirty eight completed all the responses on the survey.

Demographic data requested from participants included age, gender and years worked in the office.

**Firm A Results:**

The majority of participants were between the age of 26 and 35 years (60.0%). 44.83% females responded to the survey. Majority of employees were either employed from 6-10 years (33.33%), followed by 11-20 years which was 20% employees.

**Firm B Results:**

The majority of participants were between the age of 26 and 35 years (36.1%). 68.3% females responded to the survey. Majority of employees were either employed from 6-10 years (19.7%), Less than 6 months (19.7%) followed by 2-5 years, which was 18% employees.

Figures below indicated these results:

![Figure 28. Firm A: Age distribution](image)

![Figure 29. Firm B: Age distribution](image)
Figure 30. Firm A: Male/Female %

Figure 31. Firm B: Male/Female %

Figure 32. Firm A: Years of Employment
The overall survey results were analyzed with the aid of the Statistical Package for Social Sciences (SPSS) software. To calculate the mean of subjective evaluations (strongly disagree to strongly agree questions), statements were given numerical values of 1 to 5, with 1 being the least important and 5 being the most important. The means of responses ranges from as high as 4.98 to as low as 3.19.

Category 2 of survey questions focused on the characteristics of the work environment and whether it aligns with the strategies of alternate work environment. The results of this category are summarized in Table 11. The questions used a five point Likert-type scale to record the participants’ responses, using a scale of “1” as strongly disagree to “5” as strongly agree with “3” as neither agree nor disagree. Mean range for Firm A was 4.81 and Firm B was 4.5, indicating that employees agree that variety of workspaces suitable to carrying out diverse tasks were provided, workspaces were adequate to support the daily
job functions, technology was integrated well into the workspaces and the seating arrangements at the workplace are adequate. Mean range for Firm A was 3.59 and Firm B was 3.63, indicate that employees somewhat disagree that the level of privacy from auditory and visual distractions are at a comfortable range and areas of deep thinking or brief period of regeneration are adequately provided. However the employees strongly agree (mean range for Firm A was 4.93 and Firm B was 4.70) that this office provides the spaces for business interaction and collaboration and social interactions and collaboration.

The employees were asked to rank where they interact with their coworkers the most. The results of the two firms came to be very similar. Employees at Firm A like to interact with their coworkers the most- workstations (ranked number 1, by most), kitchen (ranked #2) and big think or open meeting space (ranked #3). Employees at Firm B ranked Workstation as number one, café as number two and open meeting space number three. The employees were asked to rank the places where they conduct most of their daily tasks. Firm A ranked workstations as number 1, small meeting rooms as number 2 and brody chairs spaces as number 3. Firm B ranked workstations as number 1, huddle rooms as number 2 and open meeting spaces as number 3.

Table 11. Category 2: Descriptive Statistics to gain insight into the workplace
Note: There were 27 respondents from Firm A, 3 respondent skipped. There were 48 respondents from Firm B and 13 respondent skipped the question.

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRM A</td>
<td>FIRM B</td>
</tr>
<tr>
<td>A variety of work spaces suitable to carrying out diverse tasks are available.</td>
<td>4.82</td>
</tr>
<tr>
<td>These work spaces are adequate to support daily job functions.</td>
<td>4.55</td>
</tr>
</tbody>
</table>
Category 3 focused on understanding how effective this workplace is with some open ended questions. The results of this category are summarized in Table 12. The questions used a five point Likert-type scale to record the participants’ responses, using a scale of “1” as strongly disagree to “5” as strongly agree with “3” as neither agree nor disagree. Means range varies between 4.0 and 5.0, indicate that employees agree that they feel more connected, engaged with their work and coworkers, productive, comfortable, satisfied and sense of autonomy in this workplace. However, means indicate that employees were neutral at Firm B, with mean of 3.33 and 3.66 and agree at Firm A, with mean of 4.35 and 4.0 for opportunity to learn and enjoy mindfulness and the new workplace has changed their perspective to stay with the firm respectively.
Table 12. Category 3: Descriptive Statistics to gain insight on the effectiveness of the overall workplace and how it influences employees’ job satisfaction, engagement and willingness to stay with the corporation.

Note: There were 26 respondents from Firm A, 4 respondent skipped. There were 39 respondents from Firm B and 22 respondent skipped the question

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRM A</td>
<td>FIRM B</td>
</tr>
<tr>
<td>There was enough communication from the management regarding the new/remodeled space. In particular, regarding how it would differ from the former premises, and how to navigate any complications that might arise from those changes.</td>
<td>4.42</td>
</tr>
<tr>
<td>I feel more connected and engaged about my work at this workplace.</td>
<td>4.46</td>
</tr>
<tr>
<td>I feel more productive in this workplace than outside of it (i.e., working at home, in a coffee shop, etc.).</td>
<td>4.15</td>
</tr>
<tr>
<td>I feel more comfortable in this workplace.</td>
<td>4.38</td>
</tr>
<tr>
<td>This workplace provides opportunities for learning.</td>
<td>4.50</td>
</tr>
<tr>
<td>I feel a sense of autonomy at this workplace.</td>
<td>4.23</td>
</tr>
<tr>
<td>I feel more engaged with my coworkers in this new space.</td>
<td>4.69</td>
</tr>
<tr>
<td>There are opportunities during the workday to enjoy mindfulness.</td>
<td>4.11</td>
</tr>
<tr>
<td>My overall work satisfaction has increased in this workplace.</td>
<td>4.35</td>
</tr>
<tr>
<td>This workplace has changed my perspective to stay with this corporation for a longer time.</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Three open ended questions were asked to the employees. First one focused on which space makes them most productive. The responses in both the firms were very similar.

Around 60% of the employees were most productive at their work stations. Some of the emerging themes which came up were, really depends on the task. The employees felt that they if they like to carry on the focused activity they were productive at workstations, focused room, broody (firm A) or High top peripheral seats (Firm B). If they would like to collaborate they were most productive either in the huddle rooms or open collaborative areas.
Second open ended questions focused on which space makes them feel the most autonomous? Most of the employees felt that their workstation and small collaborative areas like huddle rooms gave them most autonomy. Some of the other emerging concepts were- entire open office, unassigned seats, variety etc. One of the participant responded:

I feel the entire office can help make feel that way depending on the day, my tasks and my mood. I have found I really do enjoy moving daily so I can feel in control of how I am going to work that day. Most days I do use a workstation for majority of the day but having the option to change that is helpful on days I need to focus more on quiet tasks.

Another participant felt that:

Everywhere -I feel like I am empowered to make choices based on what fits my needs at any given moment during the workday

Hence, their ability to use any space in the office provided them with autonomy.

Last question focused on opportunity to learn, which space makes it most conducive to their learning. Most of the employees said the open collaborative area, big think for firm A and huddle rooms provided opportunity for learning. Two of the participant responded:

Knowledge sharing / transparency in the design. Sitting in workstation pods next to multiple disciplines.

The shared knowledge, both in what is pinned up or floating in the air of the collaborative studio and also the culture of learning and sharing that is exhibited through IDT, DX, M3 etc. and mentorship on projects. I love the resource library, I wish we could expand it to have more of a design library/business books as well to highlight knowledge and self-development even further.

Some of the emerging concepts which came from these were openness, visibility, access to colleagues, pin up spaces to display work, strategic location of main conference area and where display of work is left as is to go and see it.

Category 4 was aimed to learn their opinion about the non-territorial workspace. The majority of questions for this questionnaire used a five point Likert-type scale to record the
participants’ responses, using a scale of “1” as strongly disagree to “5” as strongly agree with “3” as neither agree nor disagree. Based on the mean the employees strongly agree (see table 13) that non-territorial workstations provide opportunity to engage with their work and coworkers, flexibility. Mean indicates that employees feel that agree it provides satisfaction, autonomy, healthy morale, creativity and innovation. However employees disagreed (see table 13) that they provide a sense of visual and acoustic privacy.

Table 13. Category 4: Descriptive Statistics to gain insight on the effectiveness of 100% non-territorial/unassigned workspace

Note: There were 26 respondents from Firm A, 4 respondent skipped. There were 39 respondents from Firm B and 22 respondent skipped the question

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FIRM A</td>
</tr>
<tr>
<td>Provides an opportunity to engage with my coworkers.</td>
<td>4.84</td>
</tr>
<tr>
<td>Provides an opportunity to be engaged with my tasks</td>
<td>4.46</td>
</tr>
<tr>
<td>Provides flexibility</td>
<td>4.92</td>
</tr>
<tr>
<td>Provides a sense of visual privacy.</td>
<td>3.30</td>
</tr>
<tr>
<td>Provides a sense of acoustical privacy.</td>
<td>3.20</td>
</tr>
<tr>
<td>Supports productivity.</td>
<td>4.00</td>
</tr>
<tr>
<td>Supports work satisfaction.</td>
<td>4.11</td>
</tr>
<tr>
<td>Supports a sense of autonomy.</td>
<td>4.57</td>
</tr>
<tr>
<td>Supports healthy morale.</td>
<td>4.54</td>
</tr>
<tr>
<td>Supports creativity and innovation.</td>
<td>4.58</td>
</tr>
</tbody>
</table>
Some of the emerging concepts which came from the survey were that employees did find the alternate workplaces do provide a variety of work spaces to carry their diverse tasks, provide spaces for interaction and collaboration. However, means indicate that level of privacy from auditory and visual distractions in not in a comfortable range. Survey also indicated that employees find that three categories of effectiveness autonomy, opportunity to learn, and flexibility were being met. Some of the concept like transparency, openness, lack of boundaries, open plan, variety and choice were confirmed in the surveys to make it effective which emerged in in-depth interviews. Employees found the same about the non-territorial workspaces. Some of the other space types which provided this were peripheral seating, library space, big think space etc. They felt that they were more productive, engaged and satisfied in this setting. However, means indicate that this concept didn’t provide opportunity during the day to enjoy mindfulness and a sense of visual and acoustical privacy.

This study highlights the importance of various spatial elements in facilitating and impeding workplace effectiveness and employee outcome such as satisfaction, engagement and retention. In the last open ended question in the survey the employees were asked if they had suggestions to change anything to make this workplace more effective.

Both firm’s employees suggested more training on the use of technology in conference/project room/small breakout space. One of the survey participant commented:

While I feel the technology is sufficient, it seems that the start of every meeting is struggling with how to connect.

Almost 100% of the participants from both the firms suggested better lighting and thermal control for the workplace. Some of the other suggestions from employees from Firm A were: better acoustical control in the private spaces and more pinnable spaces to display their work.
Employees from Firm B suggested that the TV screen need to be smaller, they are big and too close the chairs, phone room are claustrophobic, better access to office supplies, making perimeter seating more user and technology friendly, by adding more power outlets.

**STAGE 3: INTEGRATION OF THE FINDINGS**

The results of the quantitative surveys where integrated to come up with spatial attributes for effective workplace and how they facilitate or impeded employee productivity, satisfaction, engagement and possibility of retention. The table describes the categories of effectiveness and which spatial attributes lead to what behavioral outcome associated with that. The findings reveal that spatial patterns and types related to alternate workplace strategy in non-territorial workspace successfully delivers elements of effectiveness hence providing satisfaction, engagement and retention. However some of the goals of effectiveness are compromised in this environment.

Table 14. Integration of the Findings

<table>
<thead>
<tr>
<th>CATEGORIES OF EFFECTIVENESS</th>
<th>WORKPLACE STRATEGY, SPATIAL PATTERN AND CONCEPTS</th>
<th>SPACE TYPES AND STRATEGIES</th>
<th>WORK OUTCOMES EMPLOYEES ATTITUDE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flexibility</strong></td>
<td>Alternate Workplace Model, Non-territorial workspace, Variety and Choice, Access, Transparency, Seamless boundaries, Control, Collaboration</td>
<td>Un-assigned workstations. Different types of office seating landscapes. Central Filing System Open Floor Plan and its Legibility</td>
<td>Greater job satisfaction Engagement Greater probability of retention</td>
</tr>
<tr>
<td><strong>Opportunities to Learn</strong></td>
<td>Surfaces, Transparency, Community, Positioning Variety and Choice</td>
<td>Vertical Pinable surfaces, white boards, Employee Award wall, Employee Personalized wall, Presence of Media, different types of spaces to interact and collaborate, unassigned workspaces, <strong>hallways, material/resource library</strong></td>
<td>Engagement Greater job satisfaction Greater probability of retention</td>
</tr>
<tr>
<td></td>
<td>Impede- lack of pinnable surface at Firm A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 14. (continued)

<table>
<thead>
<tr>
<th>Autonomy</th>
<th>Access, Control, Variety and Choice, Privacy, Personalization, Concentration Juxtaposition Control</th>
<th>Different types of seating, Open floor plan, technology, unassigned work space, different types of spaces to interact and collaborate Controls such as mechanical, acoustics and lighting.</th>
<th>Engagement Greater job satisfaction Greater probability of retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Impede: Lack of privacy- visual and auditory Lack of Personalization</td>
<td>Impede: Lack of control over lighting, mechanical controls</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Culture of Trust</th>
<th>Positioning, transparency, Juxtaposition, Seamless boundaries Flattened Hierarchy, Variety and Choice</th>
<th>Open Floor Plan, variety of seating, pinable and writable surfaces, no private offices, various interaction nodes.</th>
<th>Greater job satisfaction Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack of privacy- visual and auditory privacy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Summary**

In this study there is evidence that the alternate workplace with 100% non-territorial workspace enhances interaction, collaboration and social activity and challenges the hierarchical structure of the workplace. This model is effective as it provides flexibility, autonomy, opportunities for learning, creates a culture of trust. The research also reveals that it is not just the operation and policies but the spatial attributes that have successfully delivered these elements of effectiveness hence provide satisfaction, engagement and retention. However some of the goals of culture of trust and autonomy like privacy, personalization and lack of control are compromised in these environments.

This chapter presents the results of data collected from the qualitative and quantitative studies. The results of the quantitative surveys where integrated to come up with spatial attributes for effective workplace and how they facilitate or impeded employee productivity,
satisfaction, engagement and possibility of retention. Chapter five discusses the significance of these findings in relation to the previous as well as future research and their subsequent implications for workplace design.
CHAPTER 5. SUMMARY AND CONCLUSION

Overview

Chapter One proposed the rationale and purpose of this research, noting how the presence of alternative workplace with assigned and unassigned workspaces in work environment grew out of the trends. There was a lack of research on how effective these spaces are on employees’ engagement, satisfaction and retention. The purpose of this thesis is to understand the contribution of spatial attributes on the effectiveness in 100% non-territorial workspaces based on the strategy of alternate workplace through employees’ everyday experience. Chapter Two outlined the 20th and 21st century office highlighting the significant characteristics and organizational and cultural shifts. The research also revealed the relationship between physical environment and organizational effectiveness and the need for these relationships especially in non-territorial environments to be explored further. The study described in this thesis responds to this need. Chapter Three outlines the process and method used to explore the effectiveness of alternate workplace strategy with 100% non-territorial/unassigned workspaces. This chapter first explains the research methodology adopted for this study and then defines and explains how the case studies were selected. The process of data collection using semi structured/open ended interviews and survey is explained followed by data analysis. Chapter Four presented the results from observations, interviews and surveys.

Chapter Five presents the final discussion with a goal to provide a more comprehensive understanding of the overall workplace environment. Considerations for future research on alternate workplace with non-territorial workspace are presented.
Relationship of the Findings to the Workplace Design Research

In the two case studies the employees undertake their work not only at the workstation but at variety of work settings inside the office like project rooms, huddle rooms, café, living rooms etc. The individual employees’ do not have a dedicated personally assigned office, workstations or desks. This study responds to the need for research on effectiveness of the 100% non-territorial workspaces based on alternate workplace strategy. It makes its contribution through the description and analysis of employees’ grounded experience of these two specific non-territorial case studies. The primary research questions driving this study are: *What spatial characteristics in an unassigned alternate workplace make them effective workplaces? Do these spatial characteristics contribute positively to employees’ engagement, satisfaction and retention?* The thesis is aimed to reveal the participants’ perspectives and interpretations of their own actions/behavior and their physical environment on effectiveness in relation to the unassigned alternate workplace. The information helped in development of an overarching theoretical scheme for integrating categories and describing the employees’ experiences of their work environment from the various perspectives.

Findings and Spatial Considerations

The findings highlight the importance of various spatial attributes in facilitating and impeding the effectiveness and employee outcome such as satisfaction, engagement and retention. Some of the emerging concepts/considerations which came from this research were highlighted in the tables in previous chapter. The relationships of study’s findings to effective workplace design research were:
Flexibility: According to Alfred P. Sloan Foundation, national workplace flexibility initiative, "Flexibility is about an employee and an employer making changes to when, where and how a person will work to better meet individual and business needs. Flexibility enables both individual and business needs to be met through making changes to the time (when), location (where) and manner (how) in which an employee works. Flexibility should be mutually beneficial to both the employer and employee and result in superior outcomes.” (Aequus Partners, 2010)

Based on the interviews and survey, both alternate workplace strategy and non-territorial workspace offer that flexibility allowing employees to work better to fulfill the individual and business needs. The workplace is transparent, all the spaces are accessible to all, and equipped with technology making it conducive to carry out both individual and group work. Also, the employees felt they were offered choice and variety and could conduct work from diverse spaces and settings.

Opportunities for Learning: A job where the meaning and importance of the work is clear; that encourages learning and creativity; and has enough task variety to keep you interested provides opportunities for learning (Gallinsky, 2010). Alternative work strategy with un-assigned workspaces is an ideal method for this as it offers employees access to the projects and their coworkers. Synthesis of results from the two case studies revealed that the spatial concepts like transparency, seamless boundaries, variety and choice, positioning offer employees’ to learn from the environment as well as from each-other. Spatial attributes like writable surfaces, pin up areas to demonstrate projects, proximity of conference and meeting spaces to the work areas all provided with an opportunity to learn. However, in the survey and also based on observation, it was noticed that there was a lack of pin-up spaces in Firm A
and they could be a provision made for these so that the employees get an opportunity to learn from different ongoing projects.

**Culture of Trust:** A workplace culture where supervisors are trustworthy, ethical, and seek your input to improve performance (Gallinsky, 2014). According to Becker and Steele (1995), non-territorial workplace setting promotes informal and spontaneous communications among staff who sits in different location each day, thereby widening their circle of contacts and friendships. They also reinforce minimal status distinction between the workers. Based on the interviews and survey the unassigned workstations and transparency foster friendships, camaraderie and collegiality. The employees are more aware of their colleagues and the projects the firm is producing. This surely fostered the culture of trust and making the retention rate high.

**Autonomy:** The ability to decide or have input into what your job entails, how it is done, and to be true to yourself while doing it. McCoy (2002), autonomy is the important factor for creative work in relation to the physical environments and involves the ability to take action, to later or regulate the environment. Duffy (1997), also supports the importance of autonomous work particularly in the creative work areas, where the workspace needs to offer rich and complex settings for both concentrated and group interactive work. Here, the individuals and teams occupy the space on as need basis, moving around to take advantage of a wide range of the facilities thus giving the employees of both the firms a sense of autonomy.

Becker and Steele (1995), recognize that non-territorial workspaces represent the loss of dedicated, personally assigned workspace and that this contributes to a sense of homelessness, and they believed that it would be possible to shift the focus of spatial identity
from the individual to the group creating a sense of family identity. It was understood from the in-depth interviews that the focus of was on spatial identity than family identity. However, the Firm B, had an employee award and celebration wall, along with the personalized cubbies with visual access. Firm A, didn't have any of these elements.

Sundstorm (1986) highlights the proximity between coworkers and visual accessibility as important factor for facilitating communication, the lack of physical enclosure for workspaces was associated with a difficulty to hold confidential conversations. This study concurs with this. The issues of personalizing of workspaces, participation in the design process for making decisions about the workspace, control of ambient conditions such as lighting, heating, or noise and the ability to change workspace furnishings are all connected to the sense of control of the work environment (Sundstorm 1986, O’Neill 1994, Vischer 2005 et. al.). Interviews and survey revealed that all the employees of the firm were involved in design process for making decisions about the workspace. The idea of personalization of workspace was perceived differently, the employees’ believed in not personalizing the workspace with artifacts and memorabilia but with their own work. However, the lack of control over lighting, mechanical system and, acoustics which leads to dissatisfaction at the workplace at both the firms.

**Space Utilization and Activity Analysis:** The observation revealed that employees were mostly involved in the focused activity while some were involved in the collaborative activities and others in socializing/interaction with coworkers. The space utilization results for Firm A indicate that 58% of the employee workstations/focus areas were occupied during the morning and the percentage of utilization increased in mid-morning and late afternoon. The huddle rooms and red conference room was utilized 100% in morning and mid-morning,
but the utilization declined in the afternoon. Firm B, showed the contradictory results, with low utilization of huddle rooms in morning but the utilization increased to 100% in mid-morning and late afternoon. The large conference rooms were not utilized the times the observations were being made. The utilization of these rooms depended on the social and business event. Café was consistently used in both the spaces. The results of the activity analysis and space utilization studies aligned.

An analysis of workplace design trends shows attempt to enhance social activity, increase controllability and flexibility, improve visual appeal, and de-emphasize the hierarchical structuring (Duffy 1997, Turner and Myerson 1999). In this study, there is evidence that nomadic and non-territorial work environment enhances social activity, collaboration, interaction, autonomy, provides learning opportunities and builds a culture of trust by challenging the hierarchical status. However, it would appear overall sense of visual and acoustic privacy is compromised making the workplace little less effective and affecting productivity and satisfaction on those grounds.

**Implications of the Study**

Gensler’s (2013) workplace studies suggested that an employee’s ability to choose their workspaces and tools to fit their responsibilities strengthens ability to make meaningful and successful decisions in their job. Creating a workplace environment that affords employee’s satisfaction and engagement by providing them a variety of spaces to work should be important to the organizational success. The findings of this study have implications for workplace design which are relevant for a range of stakeholders including interior designers, workplace strategist, facility managers, organizational psychologist etc. The study highlights the importance of various environmental elements and establishes the
relationship between the environmental elements and the categories of effectiveness and how they impede or facilitate engagement, satisfaction and retention of the employees in nomadic and non-territorial work environment. The study revealed that there is a level of transparency, flattened hierarchy, choice and variety of space to focus and collaborate, access to the entire workplace and employees, surfaces to express themselves and their work offering the employee’s flexibility, opportunity to learn and autonomy over the space and fostering a culture of trust. The level of collaboration, interaction and engagement with their work and with the co-workers is more prevalent in this environment as compared to the previous assigned workspace they were residing. However, it would appear overall sense of visual and acoustic privacy is compromised making the workplace little less affecting productivity on those grounds. Some of the employees indicated a loss of dedicated, personally assigned workspace contributes to a sense of homelessness. However interviews and open ended responses revealed that they were adapting themselves to this shift from the individual identity to the group identity.

The purpose of the nomadic environment to improve collaboration, productivity and engagement through more efficient communication was achieved through having a flexible spatial arrangements and shared facilities. Research results revealed that these environments provide greater adaptability and fit, equal access, ample provision of space and resources and all these leads to diverse parameters of effective workplace like autonomy, culture of trust, flexibility and opportunity to learn. However, when providing these environments attention need to be paid to psychological flexibility, provision of personalization and visual and acoustical privacy and a sense of permanency.
Limitation of the Study

The focus of the research was restricted to one business typology. Since many workplaces today are based on this model, this research could be conducted with other workplace typologies. The results of the study may vary if the participants were put in a different work environment, or if a different sample set were chosen from a different work environment. However, this research does provide rich data to give in-depth understanding of the concepts but this is not generalizable. More extensive research of similar nature across a variety of work environments in process of enhancing the validity and applicability of the findings. The observations to study employees’ activity and space utilization should be increased to better understand this phenomena better and make it more generalizable.

Future Direction

The findings of this study have implications for effective workplace design and as such are relevant for the range of the stakeholders. The study creates a foundation for the development of informing workplace design, particularly the theory that recognizes the human nature of work a need recognized by several seminal researchers. The study highlights the need for a greater understanding of how people manage and adapt in dynamic work environments. As this study was exploratory, further research is needed to continue studying the usefulness of the spatial attributes for effectiveness as a design and evaluation tool. The spatial attributes which emerged for effectiveness can be translated into quantifiable data and send to the employees as survey to learn about their productivity, satisfaction, engagement and retention. Additionally, testing these spatial attributes of effectiveness on employee satisfaction, engagement, retention across other work typologies would further validate its benefits as a design tool. This will help prove the validity of these attributes and help
understand the relation between these attributes and behavioral outcome. A further research on which generation be most effectively engaged, both as individuals and as members of teams and participative processes can be investigated in this model.

The insights obtained from this study will provide designers, architects, and facility managers with a new design tool to aid in making the non-territorial workspaces in alternate workplace model more effective.
APPENDIX A. INITIAL CORRESPONDENCE WITH THE FIRMS

Hello Everyone-

Hope you all had a good start to the summer! Things are good at this end, I am enjoying my summer with family and working on some research assignments.

Some of you might know that I have my Master’s Degree from Iowa State and I have been pursuing MFA (Master of Fine Arts) from there since last couple of years. Slowly and steadily I have been able to complete all my course work and I have started working on my Thesis project. Professor Çigdem T. Akkurt is my faculty advisor and I am copying her on the email as well.

My area of research interest has always been workplace design. For my thesis I want to focus on alternate workplace and I am particularly interested in exploring the effectiveness of non-territorial workspace at alternate workplace. The purpose of this study will be to explore the interior spatial characteristics of a workplace and to understand how those characteristics do or do not facilitate effective workspace for a non-territorial office utilizing alternate workplace strategy/concept.

Your new office space is modelled on this concept and I was wondering if I can use your office space as a case study for my thesis study. This entails:

1. I would like to interview one of the designer’s to understand the design strategy and utilization of floor plate. Make observation of the space and space usage.
2. Do an in depth interview with Senior Interior Designer/Director of Interior Design, who was not involved in the project, HR and VP/Manager to understand the overall effectiveness of this newly designed workplace.
3. Send a survey to your employees utilizing Qualtrics to understand the effectiveness of this newly designed workplace and how it has impacted engagement and job satisfaction.

I am approaching another architecture firm in town which has recently moved into a new space which is designed on the similar model to understand this phenomena more broadly. I want to assure you that there will be no comparative analysis done between the firms.

Couple of things I would like to mention:

Time commitment: Step 1: Interview with the designer: 45 minutes, observation of the space: 45 minutes.
If you can provide floor plans, drawings and allow me to take pictures that would be great!
Step 2: In-depth Interview, the questions will be provided to you ahead of time. The interview will take approximately 30-40 minutes of your time.
Step3: Interview via Qualtrics will be send to your employees and it will take them approximately 20 minutes to take it. Employee can do this within a given time frame as their leisure.

Privacy of Information: I will not disclose the identity (name, address) of the two firms in my thesis but will provide a general description of the firm. I will refer the firms as Firm A and Firm B. I will not disclose the names of anyone I will interview in my thesis report. The employee survey will be confidential to ensure candid responses. No individual data will be reported back to the organization. All responses will be grouped and a feedback report will be created across all participants. I will retain all completed surveys.
I will provide a copy of my thesis report to you after completion of my study. Thesis is typically deposited to the graduate college and a copy is kept in the University library for public use.

In future if my advisor and I plan on submitting this study for publication or presentation, we will get your consent to publish it and again the identity of your firm or any personnel will not be disclosed.

Your participation will really help me add depth to my study as I will first-hand experience and write and document about your workplace and its effectiveness based on the strategy of alternate workplace and non-territorial workspace. This will further contribute towards the body of interior design knowledge. Attached you will find my thesis proposal and questionnaire design for review.

Please let me know at your earliest convenience that you would be willing to participate in this study.

Thank you
Tina Patel
APPENDIX B. INFORMED CONSENT DOCUMENT - OBSERVATION OF WORKSPACE

EXPLORING THE EFFECTIVENESS OF NON-TERRITORIAL WORKSPACE AT ALTERNATE WORKPLACE

Investigators
Tina Patel- Graduate Student, Department of Interior Design
Cigdem Akkurt- Associate Professor, Department of Interior Design

Introduction
Based on current trends in workplace design and research, my graduate thesis focuses on assessing the effectiveness of alternate workplace model with 100% non-territorial/unassigned workspaces and exploring the spatial attributes that contribute positively to effective workplace in this setting. Your workplace has been selected as one of the case studies for this study. As a part of my research, I am observing the space for one-hour interval to assess space types and utilization.
You are being invited to participate in this study because you are utilizing the space designed as a non-territorial work space at one of the two firms selected for this study.

Description of Procedures
If you agree to participate, I will observe you and your colleagues in the redesigned work space for an hour. I will not be taking any detailed notes on individuals but rather notes on how space is being utilized and notes on the type of space.

Risks or Discomforts and Benefits
There are no foreseeable risks or benefits to you for being in this study. However, your participation will help further understand considerations and outcomes of using a non-territorial design in the work place.

Costs and Compensation
There are no costs to you from participating in this study. You will not be compensated for participating in this study.

Participant Rights
Participating in this study is completely voluntary. You may choose not to take part in the study or to stop participating at any time, for any reason, without penalty or negative consequences. You can choose to leave the space if you are uncomfortable with the observation. Any report we publish; we will not include any information that will make it possible to identify any individual in the results. Your employer will not have access to these records.

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.
Confidentiality
Your employer will receive a report of the overall analysis of the workspace, however individual data will not be included. Any records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available.
To ensure confidentiality to the extent permitted by law, the following measures will be taken: Your name will not be collected, the Firm will be known as Firm A or Firm B, observations will not contain individual identifying information.

Questions
You are encouraged to ask questions at any time during this study. For further information about the study, contact Tina Patel at tpatel@umn.edu or Prof. Çigdem Akkurt at akkurt@iastate.edu.
APPENDIX C. INFORMED CONSENT DOCUMENT - IN-DEPTH INTERVIEWS

EXPLORING THE EFFECTIVENESS OF NON-TERRITORIAL WORKSPACE AT ALTERNATE WORKPLACE

Investigators
Tina Patel- Graduate Student, Department of Interior Design
Cigdem Akkurt- Associate Professor, Department of Interior Design

Introduction
Based on current trends in workplace design and research, my graduate thesis focuses on assessing the effectiveness of alternate workplace model with 100% non-territorial/unassigned workspaces and exploring the spatial attributes that contribute positively to effective workplace in this setting. Your workplace has been selected as one of the case studies for this study. As a part of my research, I have in-depth questions which focus on assessing the effectiveness of your workplace based on the model of alternative workplace with 100% non-territorial spaces. I also want to understand the design intent from you and your perception about the space.

You are being invited to participate in this study because you are the management or the designer involved in the design of a non-territorial work space at one of the two firms selected for this study.

Description of Procedures
If you agree to participate, you will be asked to participate in an in-depth interview aimed to understand how design decisions are impacting employees. Your participation will last for approximately 45 minutes.

Risks or Discomforts and Benefits
There are no foreseeable risks or benefits to you for being in this study. However, your participation will help further understand considerations and outcomes of using a non-territorial design in the work place.

Costs and Compensation
There are no costs to you from participating in this study. You will not be compensated for participating in this study.

Participant Rights
Participating in this study is completely voluntary. You may choose not to take part in the study or to stop participating at any time, for any reason, without penalty or negative consequences. You can skip any questions that you do not wish to answer. Any report we publish; we will not include any information that will make it possible to identify any individual respondent in the results. Your employer will not have access to these records.
Confidentiality
Your name will not be revealed and only your rank will be mentioned in final reports (ie designer at Firm A or B, Manager at Firm A or B). Individual confidentiality will be maintained and none of the quotations will be referred to a particular participant. Your employer will receive a report of the overall analysis of the workspace, however individual responses or data will not be included. Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available.
To ensure confidentiality to the extent permitted by law, the following measures will be taken: Your name will not be used, the Firm will be known as Firm A or Firm B, Individual responses will not be quoted.

Questions
You are encouraged to ask questions at any time during this study. For further information about the study, contact Tina Patel at tpatel@umn.edu or Prof. Çigdem Akkurt at akkurt@iastate.edu.
APPENDIX D. SURVEY INVITATION AND REMINDER

Message 1: Survey Invitation
Dear………………..,
Hope you had a great weekend. Please see the below email with links to the survey for you to forward it to all your employees. It will be great if you can please send the survey, today, Monday July 25th, 2016. Also, if you can take time from your schedule as well and complete the survey that would be appreciated. The survey will be open for 7 business days. Please let me know if you have any questions/suggestions. Thank you for all the help!
Tina Patel
Hello Participants,
I am a graduate student pursuing my Master of Fine Arts (MFA) degree in Interior Design at Iowa State University. Based on current trends in workplace design and research, my graduate thesis focuses on assessing the effectiveness of alternate workplace model with 100% non-territorial/unassigned workspaces and exploring the spatial attributes that contribute positively to effective workplace in this setting. Your workplace has been selected as one of the case studies for this study. As a part of my research, I have a survey questionnaire which focuses on assessing the effectiveness of your workplace. Your firm is referred as Firm A in this survey.
I am inviting your participation, which will involve filling this online survey. If you agree to be in this study, please complete the online questionnaire. Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. Your responses will remain anonymous. The results of the study may be used in reports, presentations or publications but your name will not be known. Your employer will receive a report of the overall analysis, but no data or individual responses will be included. There are no foreseeable risks or benefits to you for being in this study. The records of this study will be kept private and stored securely; only researcher will have an access to the records. Any report we publish, we will not include any information that will make it possible to identify any individual respondent in the results. Your employer will not have access to these records.
The survey is very simple and self-explanatory. It has five sections. It takes approximately 20-25 minutes to complete the entire survey. Please complete one survey per person. I would appreciate you completing the survey by July 25th, 2016. In case of any questions/concerns please contact Tina Patel at tpatel@umn.edu or Prof. Çigdem Akkurt at akkurt@iastate.edu. If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.
I appreciate your time and feedback!
Tina Patel

Message 2: Survey Reminder
Greetings!
Early this week you were sent an invitation to participate in the survey that is being conducted of your workplace to assess its effectiveness. This is a friendly reminder to complete the survey before the end of day, on August 1st, 2016. If you have not already done so.

The survey is accessible online through the following link send to you in the previous email and can be completed during your work time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. Your responses will remain anonymous. The results of the study may be used in reports, presentations or publications but your name will not be known. Your employer will receive a report of the overall analysis, but no data or individual responses will be included. There are no foreseeable risks or benefits to you for being in this study.

The records of this study will be kept private and stored securely; only researcher will have access to the records. Any report we publish, we will not include any information that will make it possible to identify any individual respondent in the results. Your employer will not have access to these records.

The survey is very simple and self-explanatory. It has five sections. It takes approximately 20-25 minutes to complete the entire survey. Please complete one survey per person. I would appreciate you completing the survey by July .........................

In case of any questions/concerns please contact Tina Patel at tpatel@umn.edu or Prof. Çigdem Akkurt at akkurt@iastate.edu. If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

We thank you for your participation with this research!

Tina Patel
APPENDIX E. SURVEY ON EFFECTIVENESS OF WORKPLACE-FIRM A & B

CONSENT
Answer YES to provide your consent and complete the questionnaire.
☐ Yes (1)
☐ No (2)

DEMOGRAPHICS
Q1 What is your gender?
☐ Male (1)
☐ Female (2)

Q2 What is your age?
☐ 18-25 yr-old (1)
☐ 26–35 yr-old (2)
☐ 36-45 yr-old (3)
☐ 46-55 yr-old (4)
☐ 55-65 yr-old (5)
☐ More (6)

Q3 How many years have you worked at this corporation?
☐ Less than 6 months (1)
☐ 6 months-1 year (2)
☐ 1 -2 years (3)
☐ 2-5 years (4)
☐ 6-10 years (5)
☐ 11-20 years (6)
☐ 21-30 years (7)
☐ More than 30 Years (8)

OVERALL WORK ENVIRONMENT
Q4. The purpose of the following statements is to get an insight into your current workplace. (Using the scale below, please indicate the extent to which you disagree or agree with each statement. 1 = Strongly Disagree, 2 = Disagree, 3= Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree)

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<th>Strongly Disagree (1)</th>
<th>Disagree (2)</th>
<th>Neither agree nor disagree (3)</th>
<th>Agree (4)</th>
<th>Strongly Agree (5)</th>
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<td>1. A variety of work spaces suitable to carrying out diverse tasks are available.</td>
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<td>2. These work spaces are</td>
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adequate to support daily job functions.

3. Technology is adequately integrated into most of the work spaces.

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4. The seating arrangements at the workplace are adequate (e.g., ample opportunities to sit, comfortable chairs, good postural support).

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5. The level of privacy from auditory and visual distractions is at a comfortable level to carry out focused tasks.

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6. There are spaces which allow deep thinking or a brief period of regeneration.

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7. There are spaces which allow for business interaction and collaboration.

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8. There are spaces which allow for social interaction and collaboration.

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**Q5 Rank the top 3 spaces at your workplace where you interact with coworkers during the day.**

- Small Meeting Rooms (Minney, Mo- used for Firm A)
- Phone Booth (Eeny, meeny- used for Firm A)
- Open Workstations
- Café (Kitchen used for Firm A)
- Materials Library
Q6 Rank the top 3 spaces at your workplace where you conduct your daily tasks.

1. Small Meeting Rooms (Minney, Mo- used for Firm A)
2. Phone Booth (Eeny, meeny- used for Firm A)
3. Open Workstations
4. Café (Kitchen used for Firm A)
5. Materials Library
6. Printer and Copy Area
7. Conference Room (Red Conference room –used for Firm A)
8. The Big Conference Room (The Big Think –used for Firm A)
9. Mail Room
10. Corridor
11. Other

Q7 The purpose of the following statements is to get an insight on the effectiveness of the overall workplace and how it influences your job satisfaction; engagement; and willingness to stay with the corporation. (Using the scale below, please indicate the extent to which you disagree or agree with each statement. Remember to think only about your job, rather than your reactions to the job. 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 =)

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<tr>
<th>Statement</th>
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<th>Disagree (2)</th>
<th>Neither Agree or Disagree (3)</th>
<th>Agree (4)</th>
<th>Strongly Agree (5)</th>
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<td>1. There was enough communication from the management regarding the new/remodeled space. In particular, regarding how it would differ from the former premises, and how to navigate any complications that might arise from those changes.</td>
<td>○</td>
<td>○</td>
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<td>2. I feel more connected</td>
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and engaged about my work at this workplace.

3. I feel more productive in this workplace than outside of it (i.e., working at home, in a coffee shop, etc.).

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4. I feel more comfortable in this workplace.

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5. This workplace provides opportunities for learning.

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<thead>
<tr>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
</tbody>
</table>

6. I feel a sense of autonomy at this workplace.

<table>
<thead>
<tr>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
</tbody>
</table>

7. I feel more engaged with my coworkers in this new space.

<table>
<thead>
<tr>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
</tbody>
</table>

8. There are opportunities during the workday to enjoy mindfulness.

<table>
<thead>
<tr>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
</tbody>
</table>

9. My overall work satisfaction has increased in this workplace.

<table>
<thead>
<tr>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
</tbody>
</table>

10. This workplace has changed my perspective to stay with this corporation for a longer time.

<table>
<thead>
<tr>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
</tbody>
</table>

*Agree, 5 = Strongly Agree*
Q8 Amongst the variety of spaces provided at your workplace which space makes you most productive?

Q9 Amongst the variety of spaces provided at your workplace, in which space do you feel most autonomous?

Q10 Which element of your workspace makes it most conducive to your learning?

**EFEFCTIVENESS OF NON-TERRITORIAL WORKSPACE**

Q11 The purpose of the following statements is to get an insight on the effectiveness of 100% non-territorial/unassigned workspace at your workplace. Using the scale below, please indicate the extent to which you disagree or agree with each statement. Remember to think only about your job, rather than your reactions to the job. 1 = Strongly Disagree, 2 = Disagree, 3= Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree)

**NON-TERRITORIAL WORKSPACES IN THIS OFFICE:**

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Somewhat disagree</th>
<th>Neither agree nor disagree</th>
<th>Somewhat agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provides an opportunity to engage with my coworkers</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Provides an opportunity to be engaged with my tasks</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Provides flexibility</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Provides a sense of visual privacy.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Q12 Any suggestion on how else this workplace can be made more effective for you?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>5. Provides a sense of acoustical privacy.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>6. Supports productivity</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>7. Supports a sense of autonomy</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>8. Supports healthy morale</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>9. Supports work satisfaction</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>10. Supports creativity and innovation</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>
Date: 7/19/2016
To: Tina Patel
1247 Ray Pl.
Falcon Heights, MN 55018
From: Office for Responsible Research
Title: Exploring the Effectiveness of Non-Territorial Workspace at Alternative Workplace
IRB ID: 16-310
Approval Date: 7/19/2016
Date for Continuing Review: 7/19/2018
Submission Type: New
Review Type: Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- Use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- Retain signed informed consent documents for 3 years after the close of the study, when documented consent is required.
- Obtain IRB approval prior to implementing any changes to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences involving risks to subjects or others; and (2) any other unanticipated problems involving risks to subjects or others.
- Stop all research activity if IRB approval lapses, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- Complete a new continuing review form at least three to four weeks prior to the date for continuing review as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. Approval from other entities may also be needed. For example, access to data from private records (e.g., student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. IRB approval in no way implies or guarantees that permission from these other entities will be granted.

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 202 Kingland, to officially close the project.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.
APPENDIX G. SPACE UTILIZATION AND ACTIVITY ANALYSIS FOR FIRM A BASED ON THE OBSERVATIONS

58%
Workstations were occupied/ people working and focusing

100%
The collaborative areas- project rooms, conference room and material library

33%
Interacting and getting coffee

50%
Taking phone calls and answering emails

TIME: 8:30 AM-9:30 AM | how spaces were utilized

62% (WS) + 50% (FOCUS ROOM)
Workstations were occupied/ people working and focusing

100%
The collaborative areas- project room, conference room and material library

66%
Interacting and getting lunch

50%
To take phone call and answering emails

TIME: 11:30 AM-12:30 PM | how spaces were utilized
70%
Workstations were occupied/ people working and focusing

50%
The collaborative areas- huddle room and conference room

33%
Interacting

50%
To take phone call and answering emails

TIME: 3:30 PM-4:30 PM | how spaces were utilized

<table>
<thead>
<tr>
<th>Time</th>
<th>Workstations</th>
<th>Meeting</th>
<th>Focused</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 AM-9:30 AM</td>
<td>55%</td>
<td>6%</td>
<td>33%</td>
<td>6%</td>
</tr>
<tr>
<td>27 employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:30 AM-9:30 AM</td>
<td>51%</td>
<td>6%</td>
<td>30%</td>
<td>13%</td>
</tr>
<tr>
<td>33 employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:30 PM -4:30 PM</td>
<td>70%</td>
<td>6%</td>
<td>15%</td>
<td>9%</td>
</tr>
<tr>
<td>26 employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

modes of work

ACTIVITY ANALYSIS
APPENDIX H. SPACE UTILIZATION AND ACTIVITY ANALYSIS FOR
FIRM B BASED ON THE OBSERVATIONS

53 %
Workstations were occupied/ people working and focusing

33%
The collaborative areas- huddle room

25%
Interacting, people had stationed themselves at workstation but were mingling

18%
Other seats occupied for focus and collaboration

TIME: 8:30 AM-9:30 AM | how spaces were utilized

76%
Workstations were occupied/ people working and focusing

100 %
The collaborative areas- huddle room and conference room

25%
Interacting, people had stationed themselves at workstation but were mingling

28%
Other seats occupied for focus and collaboration

TIME: 11:30 AM-12:30 PM | how spaces were utilized
69%
Workstations were occupied/people working and focusing

66%
The collaborative areas—huddle room

12%
Interacting, people had stationed themselves at workstation but were mingling

15%
Other seats occupied for focus and collaboration

TIME: 3:00 PM-4:00 PM | how spaces were utilized

<table>
<thead>
<tr>
<th></th>
<th>Modes of Work</th>
<th>Activity Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 AM-9:30 AM</td>
<td>64%</td>
<td>20%</td>
</tr>
<tr>
<td>49 employees</td>
<td></td>
<td>16%</td>
</tr>
<tr>
<td>11:30 AM-12:30 AM</td>
<td>57%</td>
<td>31%</td>
</tr>
<tr>
<td>76 people present</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>(employees and guests)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00 PM-4:00 PM</td>
<td>60%</td>
<td>33%</td>
</tr>
<tr>
<td>63 employees</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>(employees and guests)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPACE UTILIZATION
REFERENCES


Hua, Y., Oswald, A., & Yang, X. (2011). Effectiveness of daylighting design and occupant visual satisfaction in a LEED Gold laboratory building. *Building and Environment, 46*(1), 54-64. doi: 10.1016/j.buildenv.2010.06.016


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