

“Since open office workplace environments in a federal government law enforcement agency are new, is there a method to determine their success levels?”

Determining the Success Level of Open Office

Workplaces within a Federal Law Enforcement Agency



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Abstract

A Presidential Executive Order to reduce federal government building sizes launched a dramatic reduction in the federal government budget since the 2012 furlough and the commercial industry evolution from 1980's style system furniture to open office workplace environments and provided the perfect opportunity for a major transformation. As a result, our research team took a closer look at the old system furniture products, conducted brainstorming sessions, invited several top furniture manufacturers to provide their examples of our concepts, and used design thinking methods to create an open office workspace solution. The success of this solution, however, was unknown. Using design thinking strategies, the purpose of this study was to determine if the open office workspace solutions have successfully provided adequate privacy, increased productivity, enhanced security, and deployed efficient storage space for a specific federal government and intelligence community law enforcement agency. A secondary purpose was to design the right mix between collaborative versus focus spaces, which will define the meaning of a Balanced Office Workplace Environment (B.O.W. E.) for the agency. The level of success was determined through key design thinking methods: Fly-on-the-Wall Observations, Affinity Clustering, a Questionnaire, Contextual Inquiry, and Prototyping. Affinity Clustering of the observation

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data showed an equal amount of collaborative versus focus work among employees. Questionnaire results indicated above average scores in the areas of collaboration (mean score of 3.27 out of 5), productivity ($M = 3.19$), security ($M = 3.38$), and storage ($M = 2.99$). However, areas for improvement are needed for focus ($M = 2.76$) and privacy ($M = 2.15$). Our goal in the future is to design additional iterations of the open office workplace solution to improve focus and privacy scores while allowing for the high score in collaboration to still remain. We believe designing spaces that allow for more client involvement, flexibility, mobility, and openness, while maintaining the ability to concentrate, will allow employees to work more efficiently and effectively in the 21st century and beyond.

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Introduction

For years, the design of federal government office spaces has been based on function, maximizing the total number of people in a space, and providing a safe working environment. The federal government was acquiring buildings and “packing them in” at record numbers until 2006 (see Figure 1). This was the start of our federal government taking a closer



Figure 1 – Old style workstations or cubicles stuffed into a working environment.



Figure 2 – President Obama signing an executive order.

look at its real estate holding and overall efficiencies due to the pending budget cuts. If drastic measures were not taken to reduce the amount of spending the federal government uses each year to maintain their current real estate portfolio, furloughs or layoffs of employees would occur to maintain the current rental budget. In 2008, President Obama was made aware of this critical issue, and in his memorandum, stated “agencies shall take immediate steps to make better use of remaining real property assets as measured by

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utilization and occupancy rates, annual operating cost, energy efficiency, and sustainability” (Presidential Memorandum - Disposing of Unneeded Federal Real Estate, 2010, p. 1) (see Figure 2).

Although modern open office workplace environments were trending within commercial offices in 2008, the federal government did not seriously consider their use until an Executive Order and major budget cuts caused a reassessment of the federal government situation. Some of the leading commercial furniture manufacturers such as Haworth, Herman Miller, Kimball International, Knoll, Teknion, and Steelcase, were already implementing the open office workplace concept with their commercial customers. In late 2010, as overall federal government rentable square footage was reduced, agencies started realizing they could not maintain the same size cubicles, conference rooms, storage spaces, and private offices of the past (see Figure 1). As a result, some federal government agencies started to explore reducing the footprint of their workspaces, providing open areas for unofficial meetings, and opening up the space for more collaboration as one part of the solution to the Presidential Memorandum. Federal government agencies in the process of renovating or planning a new location revised their requirements

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and aligned themselves with the memorandum. This began the conversation about open office workplace environments and the tools they use (see Figure 3).



Figure 3 - New open office workspace environment.

Some agencies took the lead on the open office workplace environment and started experimenting with this concept on some of their active projects. The long corridors, closed-door offices, and high panel cubicles that defined the office culture of the federal government offices have given way to open spaces filled with modern style desks and furniture, which employees reserve like hotel rooms. This has become the new reality for the General Services Administration (GSA) Headquarters in downtown Washington, DC (Rein, 2013) (see Figures 4 and 5). As



Figure 4 - GSA Headquarters in Washington, DC.

illustrated above, open office workplaces have become the new norm for the federal government. Yet, whether this change has been successful is not known, especially for

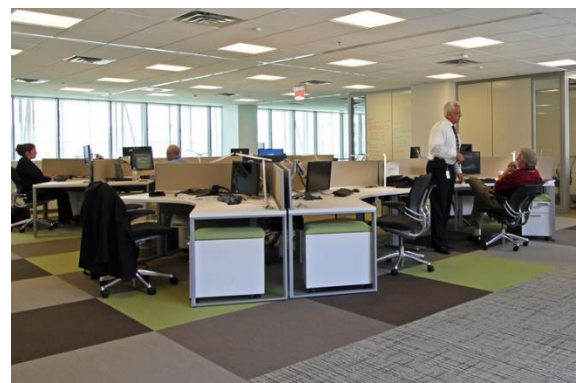


Figure 5 - GSA Headquarters in Washington, DC.

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federal government law enforcement agencies. The use of an open office workplace environment requires an understanding of what is a collaborative versus a focus space. Also, knowing how to use these spaces to help a group gain adequate privacy, increase their productivity, enhance their security, and deploy efficient storage space is the goal of this study. Non-law enforcement agencies, such as the GSA Headquarters, do not deal with heavy security protocols entrenched in law enforcement. Additionally, non-law enforcement agencies do not have a high level of people carrying a firearm to work daily and do not have elements of strong business culture compartmentalization, found in law enforcement agencies. These unique requirements are very important to the successful mission and crime fighting abilities of law enforcement agencies. Thus, the purpose of this study is to determine if the implementation of open office workspace solutions has successfully provided adequate privacy, increased productivity, enhanced security and deployed efficient storage space for our employees within a specific federal government and intelligence community law enforcement agency. A secondary purpose is to design the right amount of collaborative versus focus space. This mixture of collaborative space and focus space creates a formula for a Balanced Office Workspace Environment (B.O.W.E.). It is important to note that not all agencies will have the same mixture of spaces to be a B.O.W.E.

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Definition of Terms

1. ***Executive Order*** – a rule or order issued by the president to an executive branch of the government and having the force of law.
2. ***G.S.A.*** – Government Services Administration is an independent agency of the United States government, established in 1949 to help manage and support the basic functioning of federal agencies.
3. ***G.S.A. 20-20 Research*** – in 2002, GSA launched the Workplace 20-20 research and development program. This research and program focused its efforts on helping agencies use their workplaces as strategic resources to realign work settings into modern workplaces.
4. ***Measurement of Success*** – success is measured by reducing the overall rental budget, the acceptance of open office systems by the majority of employees, and the acceptance of open office systems as measured by productivity, efficiency, privacy, security, storage capabilities, and balance between collaborative versus focus areas.
5. ***U.S.D.A.*** – United States Department of Agriculture, also known as the Agriculture Department, was established in 1862 by President Abraham Lincoln. It is the U.S. federal executive department responsible for developing and executing federal laws related to farming, agriculture, forestry, and food.

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6. ***Federal Law Enforcement Agencies*** – Agencies authorized by the federal government under the United States Code to uphold the law and public order generally at only the federal level related to matters affecting the country as a whole.
7. ***Affinity Clustering*** – This is a method of bringing order to chaos. This method organizes items such as research data or creative ideas into logical groups. Patterns are revealed to draw insight and new ideas (Luma Institute, 2012).
8. ***Contextual Inquiry*** – This is the process of placing you in the midst of a person’s environment, so you can inquire about the person’s experience while it is happening. Responses come directly from the source who has the most knowledge (Luma Institute, 2012).
9. ***Fly-on-the-Wall Observations*** – This is an approach to conducting field research in an unobtrusive manner. This type of observation allows you to watch and listen without interfering. This type of observation gives you the chance to capture people’s natural behavior. This information is valuable in designing for the right reasons (Luma Institute, 2012).
10. ***Balance Office Workspace Environments (B.O.W.E)*** – This is the process of successfully determining the right amount of collaborative spaces and focus spaces within your office layout design.

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11. Workplace – Your workplace is the location where you go to work, such as your office building, building floor, school, or hospital. Workplaces focus on the total area experience and shared commercial work life.

12. Workspace – *Your workspace is your workstation, desk, cubicle, office pod, or table where you start working.*

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Literature Review

President Barack Obama observed the wasteful spending habits in federal government real estate leasing programs and recognized that if left unchecked, they would eventually lead to major unemployment for federal workers. The federal government owns or manages more than 900,000 buildings or other structures across the country and over 14,000 of these locations are no longer needed and are costly to maintain (Pristin, 2011). Many of these buildings



Figure 6 - A vacant federal building in Maryland.



Figure 7 - President Obama signing the executive order.

are left vacant for years (see Figure 6). President Obama ordered executive agencies to accelerate efforts to dispose of unneeded buildings and set a goal of saving \$3 billion dollars by the end of 2012 (Pristin, 2011). The Administration created an independent commission that recommended ways the government could use its space more efficiently by consolidating space or encouraging agencies to move into one building. The actions of reducing used real estate, streamlining resources, and implementing sustainable measures led

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to the conversation, creation, planning, and installation of open office workplace environments within intelligence community law enforcement agencies today. Now the biggest question is, “are they successful and effective?” (Lew, 2011, p. 2). The President wanted to start an integrated strategy towards real estate reduction and sustainability. To do so, he needed to change the federal government’s real estate footprint quickly, but with little national impact to federal government employees (Office of the Press Secretary, 2009). Real estate portfolios dominated by larger than average tenants or U.S. Federal Government tenants were affected much sooner by downsizing efforts compared to smaller private sector tenants (Miller, 2013).

In 2010, President Obama continued a more aggressive push to reduce the overall footprint of the federal government real estate portfolio. President Obama signed Executive Order 13514 (see Figure 7). Federal government law enforcement agencies following Executive Order 13514 discovered this reduction of real estate and their current employee numbers would not fit into the new facilities in their current configuration. The overall square footage of an employee’s workspace or cubicle had to be reduced; however, by how much, was not known at that time. Also in 2010, the need to dispose of unneeded real estate properties became a major issue with the federal budget collapse looming. The Chairman of the House subcommittee on public

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buildings and Republican of California Jeff Denham said, “The goal in the short term is to sell as many buildings as possible to generate some immediate cash flow to help with the debt crisis” (Pristin, 2011, p. 1). In 2011, federal agencies specific to the intelligence community law enforcement field started exploring alternate working environments that included reducing the standard traditional cubicle or system furniture size, as well as exploring open office workspace concepts.

Open Office Workplace Design: The Balance between Collaboration Space and Focus Space

Although the open office workspace products called “Benching” is relatively new to the federal government, it has been in the commercial industry since the early part of the 21st century. Commercial furniture companies such as Haworth, Herman Miller, Kimball International, Teknion, and Steelcase are just a few of the top manufacturers involved in the development of benching style furniture. The emergence of workspace benching products was due to economic challenges driving cost reductions, strong emphasis on collaboration, and increased focus on sustainable office designs in the commercial industry. There are multiple benching solutions, but they tend to fall into one of three broad groups: Benching 1.0, Benching 2.0, and Hybrid Panel-Based Benching. Benching 1.0 includes a large stand-alone

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workspace designed for open plan spaces with little flexibility (see Figure 8). Benching 2.0 is similar to Benching 1.0, but integrates with other workstation products, such as low panels, storage products, and height-adjustable components (see Figure 9).

Hybrid Panel-Based Benching is the third group and is an amalgamation of the tried-and-true panel-based system furniture or cubicles of the past, which incorporates mobile storage units, divider partitions, and rectangular worksurfaces with Benching 2.0 (see Figure 10; Carroll, 2011). This combination creates a design that reduces the overall footprint and presents greater collaboration, focus, and interaction among the users.

Benching style workstations are not the complete solution to the new open office workplace environments. Designing the best solution



Figure 8 - Benching 1.0



Figure 9 - Benching 2.0



Figure 10 - Hybrid Panel-Based Benching

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includes both collaborative concepts and focus concepts as part of the answer.

There are four key elements behind the transition toward a better understanding of collaboration: complexity, speed, insight, and mobility (Herman Miller, 2012). Under the key element of “complexity,” our workforce today is more specialized than previous generations. This specialization makes it very difficult to solve complex problems individually. Having a collaborative space offers increased opportunity to discuss complex issues with a diverse group of people in which to solve these problems. Under the key element of “speed,” technology changes so fast that it is impossible for one person to accomplish deadlines without the assistance of others. Teaming together to resolve issues provides a collection of thoughts that produce wisdom and foresight over time, which encompasses the element of “speed.” Last, under the key element of “mobility,” fast-paced technology has provided the ability to work in various locations – at home, on job sites, other areas of the office, and your local coffee shop (Herman Miller, 2012).

Creating collaborative spaces within an open office workplace environment starts with understanding the interaction between the people who will occupy the space. Based on that information and the understanding that collaborative space varies according to culture, a space can be designed to have the right collaborative solution for its users because the one constant is the need for a

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greater variety of informal areas that give the users a choice about where and how they interact.

Another set of factors in the design of a balanced space are diverse workstations and focus rooms, which help shape the solution. These different workstations include Owned Open Workstations, Shared Open Workstations, Touchdown Workstations, and Focus Rooms (Herman Miller, 2012). The combination of these workstations along with design thinking methods creates a balanced office workspace environment specifically for the client or customer.

Owned Open Workstations are dedicated for the use of one person. They are normally smaller than their conventional counterparts for two main reasons: First, modern workers need less physical storage space due to the increase in digital storage provided with their technology; and second, the use of laptops and flat screens eliminate the need for deeper worksurfaces required by the massive and antiquated CRT monitors of the past. Shared Open Workstations are the largest portion of the workstations in collaborative spaces. They are shared at a standard rate of three people for each workstation. This sharing process requires some coordination among users, but since the mobile culture has made workstations more unoccupied most of the time, it is a logical direction for organizations. Touchdown Workstations (hotel-stations)

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are unassigned, available for transient visiting executives, temporary telecommuters, or contractors that need a temporary workspace. These workstations are normally smaller than the other two workstations and located in an area off the main corridor for easy access. These workstations are normally calculated at one workstation for every four people who are likely to use them. Focus Rooms are enclosed unassigned spaces similar to private offices. These spaces are mainly for individual work that demands concentration without distractions, private conversations, or personal phone calls. Other group spaces, which are called collaboration zones, such as the coffee bar, café, and lounge, are adjacent to workstation clusters. This proximity encourages spontaneous interaction. These elements and key factors together provide a better understanding of a balanced office workspace environment, facilitating the design of a complete solution for specific groups (Herman Miller, 2012).

Open Office Workplace Design in the Federal Government

One non-law enforcement federal agency leading the way with open office workplace design was the General Services Administration (GSA). GSA



Figure 11 - U.S. Forest Service Open Office Workspace

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quickly explored options in industry that could be used in these open office concept spaces and developed test locations for assessment prior to implementing the concept across the whole agency (Gensler, 2012). During this time, other federal departments and agencies were developing their concepts and ideas, pulling inspiration from the commercial industry, which started reducing their real estate footprint by using open office workplace tools and strategies in 2009. The U.S. Forest Service reconfigured the workplace of their headquarters building in Washington, DC with assistance from GSA (see Figure 11). They deployed the open office workspace strategies that GSA was prototyping and testing in their space. The project was successful; now, the U.S. Department of Agriculture (USDA) is looking to deploy this new office design strategy in one of its major field offices in the southwest. This effect would lead to a huge reduction of space and dramatically reduce its \$8 million annual rent bill (Hardy, 2015). These federal departments and agencies visited numerous commercial, state, and international companies that had deployed open office workplace environments with much success. Their goal was to determine the winning factors and deploy them in the federal government.

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While open office workplace environments have critics, they remain the primary form of workplace design. Open office workplace environments can foster collaboration, promote learning, and nurture a strong culture. Congdon, Flynn, and Redman (2014) noted that open office environments are the right strategy, but are often executed poorly. Companies demanding collaboration space need to know workers also want moments of solitude to think and/or recharge. A successful balanced workplace environment incorporates areas of solitude away from collaborative zone.

From 2012 to the present, federal government departments and/or agencies, some of which are law enforcement focused, have been actively discussing and using open office workplace environments on their



Figure 12 - Old system furniture office environment

new projects. Through the lessons learned from the GSA test pilots and small projects deploying the open office workplace environments in 2010, the federal government was on its way to a new office environment. The old office environment of the 1960s seen by millions of people each week from the set of the TV show “Mad Men” will not work in 2015 and beyond (see Figure 12). In 1980, 85% of U.S. employees said they needed places to

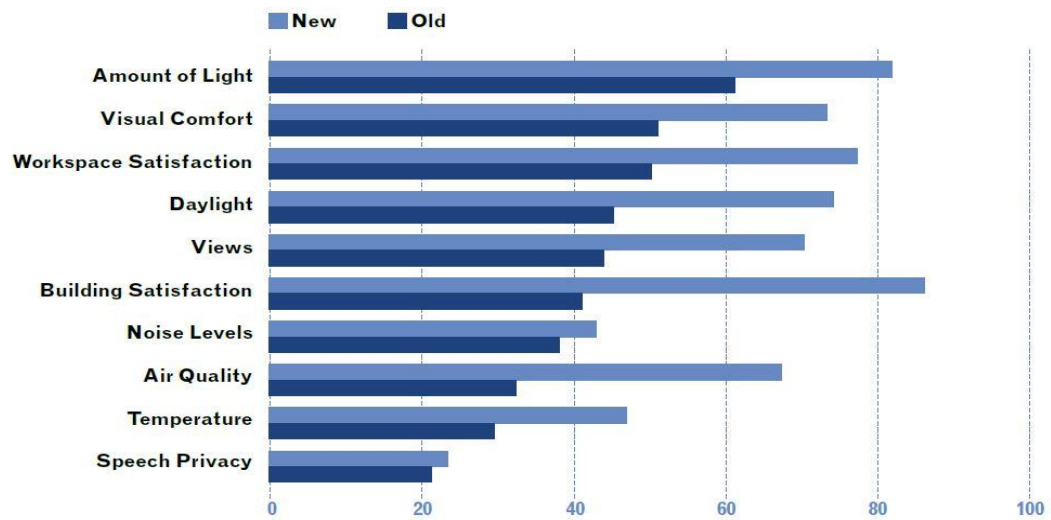
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concentrate without distractions, and 52% said they lacked such spaces. In answering their needs, thousands of high-walled cubicles were built across the corporate environment. By the late 1990s, only 23% of U.S. employees wanted more privacy. As of 2014, 50% of U.S. employees need access to other people, and 40% wanted more interaction (Congdon et al., 2014).

The open office workplace environment addresses many opportunities, including, but not limited to, enabling advanced technology to be unobstructed, preparing for changing workforce demographics, creating healthy work environments, saving money over time, and encouraging interagency collaboration and the evolution of teamwork (Vermont Government, 2013). While the G.S.A. 20-20 Research showed greater worker satisfaction in open environments, this research did not include law enforcement agencies, specifically intelligence community type law enforcement agencies (Public Building Services, 2009). A G.S.A. survey of 24,000 federal employees reflected greater satisfaction with their new open office workplace environment for light, visual comfort, noise levels, and air quality. However, speech privacy, storage capabilities, visual privacy, security, and protection were not measured (Vermont Government, 2013) (see Figure 13).

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FIG 2. PERCENT SATISFIED WITH ENVIRONMENTAL CONDITIONS



MYTH:

High cubicle partitions mean less noise, more privacy, and fewer distractions.

REALITY:

Not true. Research shows that higher cubicle partitions block standing line of sight but provide small amounts of additional acoustical shielding. But this increase in 'visual privacy' may encourage people to talk louder because they think they have more privacy. Unfortunately, there may be less privacy and more disruption.

Figure 13 – GSA survey results on environmental conditions

Open Office Workplace and Law Enforcement

At the inception of this investigation into open office workspaces, our previous research led to two major concerns from our employees: having enough storage space for employee belongings and providing enough personal privacy. Law enforcement agencies have one thing in common over non-law enforcement agencies: their connection with the justice system. Federal courts only allow specific paperwork in specific size boxes inside their courtrooms, which means an employee's workspace will have more paperwork and require

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more storage space than other typical non-law enforcement agencies that may be practicing a paperless office environment.

These same employees require more privacy to speak with clients and others that could be helpful to their case, but not overheard by co-workers. Also, privacy is an important factor in human behavior. There are some conversations you do not want your co-worker seeing or overhearing daily. Lastly, law enforcement agencies, specifically intelligence community type law enforcement agencies, have developed a few enemies over the years. Thus, an emphasis on security and the protection of employees is a high priority within these agencies. Working on specific open office balanced workspace environments and improving the overall working environment results in increased productivity from your employees or clients.

Yet, the question remains, are open office workspaces successful for law enforcement agencies that value privacy, storage, security, productivity, compartmentalized information, and protection? Can the right balance between collaborative versus focus spaces occur for law enforcement? This study aims to answer these questions.

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Method Section

History and Purpose

In 2009, a federal government and intelligence community law enforcement agency started to research open office workplace environments for multiple reasons (see Figure 14). The most important was the Presidential Executive Order to reduce overall rentable federal government space and the enormous rental budget facing the agency at that time. If the agency did not reduce its rental bill, it would be faced with layoffs of federal employees to offset the cost (see Figure 15). The path to the agency’s current open office workspace started with a closer look at its existing old system furniture workstations and a brainstorming session to develop concepts for further testing (see Appendix E for the old system furniture



Figure 14 - Typical open office



Figure 15 - U.S. citizens protesting the shutdown



Figure 16 - Typical workspace of a paper intents person

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workspace) (see Figure 16). A concept map was created from this brainstorming session that produced ideas of what we would like to see in the open office workplace environment (see Appendix C for the concept map). The concept map results led us to create the first Furniture Industry Day in the history of the agency. We requested several top furniture manufacturers to provide their vision of the new benching style workspace, with some general requirements: a 5’x 8’ workspace with storage and privacy. We also asked the federal law enforcement employees to visit the bench style workstations and complete a short survey. The survey results were used to help the team create the best solution (see Appendix F and G generation workspaces). A mind mapping session was done to determine locations to deploy these new solutions (see Appendix B for the mind map). This led to the implementation of open office workplace environments across the agency in 2014. Each location had a different set of stakeholders; a stakeholder map was created to work out their concerns about our solutions (see Appendix D for the stakeholder map). After prototyping, testing, and re-evaluating that solution, we generated several prototypes before creating the solution we use today (see Appendix H, I, and J generation workspaces).

Yet, the success of the current open office system is unknown. Success can be measured in three ways: (a) the acceptance of open office systems as

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measured by examining privacy, productivity, security, and storage capabilities; (b) the acceptance of open office systems by the majority of employees in terms of adequate collaborative / focus space for each group; and (c) reducing the overall rental budget cost. This research concentrated on the open office workspace environment’s success level in the eyes of its users under privacy, productivity, security, and storage space, along with the correct mixture of collaborative and focus spaces. The level of success was determined by using a questionnaire. A survey methodology is the best method because it directly connects the user with an evaluation process and communication pathway for improvements.

The questionnaire was developed from a brainstorming session with the team in 2013. During this brainstorming session, all suggestions were encouraged under the following framework:

1. No long questionnaires. Surveys over 10 questions are excluded within our agency, unless mandatory.
2. No complicated questionnaires. Surveys that require a lot of pre-reading to understand are ignored due to employee workloads and time constraints.

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3. No personal connection. Surveys that directly identify an employee will have a very low return rate. Our employees love being anonymous. They will identify their division and location but nothing else.

Along with the questionnaire, we completed Contextual Inquiry, Fly-on-the-Wall Observations, and Affinity Clustering. These design thinking strategies are explained in more detail under the instrument and procedure section.

Sample

The people or (subjects) that participated in this study were government employees from a specific law enforcement agency located in Chamblee, GA and Washington, DC. These employees were from various sections, units,

departments, and divisions with different professional skills and educational levels within various buildings. The subjects varied in age from 21 to 65 years old. Most employees complete a percentage of a business or office function within their space, including *sitting at your desk reading documents, keyboard*



Figure 17 - Typical office functions to be documented

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usage, hand writing thoughts or concepts, analyzing data, talking to other employees, and moving to various meetings throughout the building (see Figure 17).

Specifics regarding the sample are explained in more detail below.

Procedure and Instruments

This research study consisted of three parts. Part One included Fly-on-the-Wall Observations and Affinity Clustering. Part Two employed a survey methodology, and in Part Three, we used Contextual Inquiry and Prototyping.

Part One: The first step included Fly-on-the-Wall Observations that occurred

in newly constructed or renovated workplaces that received the current prototype in the law enforcement agency (see figure 18). It is important to note that the



Figure 18 – Fly-on-the-Wall Observation

lead researcher designed the new

workstations and that these new workspace concepts serve as the initial

prototype (see Appendix J and K). Once the employees moved into their new

workspace, the lead researcher or assigned researcher observed from

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predetermined areas without being noticed during a normal 8-hour workday. The supervisors of these spaces were fully aware of the observer and the observation periods. The researcher was introduced as an intern or analyst. This allowed the researcher to see and hear employees’ comments and behaviors around their new workspace environment. We observed business and office functions centered on our key success points of privacy, productivity, security, storage, collaboration, and focus. Unique observational behaviors included *how many items employees carry on a daily basis (adequate storage), how they set-up their desk (security), sitting at their desk reading documents (focus), keyboard usage (productivity), hand writing thoughts or concepts (privacy), analyzing data (focus), talking to other employees (collaboration), and moving to various meetings throughout the building (collaboration)* to better understand the typical day of a law enforcement employee.

The instructions for the Fly-on-the-Wall Observations were as follows:

1. The target person observed was determined by the lead researcher. The lead researcher used the numerical selection method to determine the target. Numerical selection is the process of giving each person in the observation area a number, then pooling the numbers

together in a cup and selecting one number to observe for that day.

(Random Selection)

2. Prior to completing the observations, the lead researcher coordinated with the supervisor on a date and time for the observation to ensure the target is working.

3. The observer took open-ended notes during the observation session using the Fly-on-the-Wall Observation card (see Appendix L).

4. The observer recorded behaviors related to privacy, storage, productivity, focus, and collaboration as defined on the Fly-on-the-Wall Observation card for 4 hours for 1 week.

a. Observer-recorded behaviors included:

1. Storage: observe and note use of storage items, desk layout for clutter, items brought in to work.

2. Privacy: privacy for focus work such as writing concepts or notes. Observed forms of distraction.

3. Productivity: amount of keyboard usage without disruptions.

4. Focus: amount of time devoted to focus work.

5. Collaboration: amount of time talking with other employees or moving to meetings.

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All observers went through a basic observation training and practice session before being placed in an official observational environment. Upon completion of the observations, the researcher used affinity clustering to group common themes and categories retrieved from the observation data.

Part Two: Next, the lead researcher collected a list of recently completed large building projects, small building projects, training facility office space projects, and headquarters building projects of law enforcement agencies from the program manager. From this list, the lead researcher selected four locations to conduct the online questionnaire. The selection of the four locations is non-random. The lead researcher contacted the main stakeholders of these locations and requested the names and contact information of their supervisors within the law enforcement staff,



Figure 19 - Typical person completing a digital questionnaire.

professional staff, and administrative staff. Once contact was established, the lead researcher forwarded the questionnaire to the supervisors. Each supervisor sent the online questionnaire to one to five people in his/her

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department, depending on the overall size of the department (see figure 19). The lead researcher suggested supervisors use their official employee list to determine the online questionnaire distribution. The lead researcher informed the supervisors that the questionnaires needed to be completed within 5 business days and returned to the lead researcher directly to maintain privacy. The lead researcher offered to visit the locations and answer any questions, pertaining to the questionnaire, study, or both. After 3 business days, the lead researcher sent out a reminder email to the supervisors of the survey completion deadline. On the fifth business day, the lead researcher sent another reminder to the supervisors that the completed questionnaires were due by end of the day. On the sixth business day, the lead researcher collected the returned questionnaires and started the data analysis process. The data was analyzed by using weighted averaging, which is the accurate measurement for scores that are important to each other.

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Part Three: The last part of the study included the design thinking strategy

Contextual Inquiry by visiting the predetermined five to ten locations where the questionnaires were sent and conducting meetings with five to 20 employees around a mock-up workspace (see Appendix J)



Figure 20 - Typical meeting in an open office collaboration zone

designed by the lead researcher to discuss the major concerns gathered from the questionnaires. This strategy helped reveal what people are actually saying and doing at these workspaces. This strategy also provides a deeper empathic understanding of the users’ needs inside and around the workspace units (see figure 20). Depending on the location and number of employees surveyed, this session was either a one-on-one or group open discussion, with a lead off open-ended question such as “What do you like and dislike about the new open office workstations?” The researcher listened and took notes on the discussion, encouraging the end user to talk freely in order to allow true concerns to emerge.

Once the data was collected and analyzed from the three parts of the study, the lead researcher developed a revised prototype of a workspace area

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that will be reviewed and possibly approved for deployment within the next major new building project.

Internal Validity

The strategies deployed to maintain the validity of this research were *member checking*, *spending prolonged time in the field*, and *debriefing*. The lead researcher or researcher assistants have access to the master employee roster of each location to validate that the supervisors are official, and their selectee is from their unit or department. The lead researcher spent prolonged time at these locations during the construction or renovation



Figure 21 – Construction site during furniture installation



Figure 22 - Typical meeting in an open office collaboration zone with stakeholders

phases of the project prior to full occupancy of the building (see figures 21 and 22). The lead researcher established a business relationship with the senior leadership to provide favorable acceptance of the questionnaires as

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enhancements to the overall mission of the agency. The lead researcher also agreed to ongoing debriefs of the study status to all stakeholders as an effort to establish “buy in” to the overall modernization and growth of the agency. These combined validity strategies ensured a high rate of successful participation from employees.

Results and Discussion

The relationship between people and their environments, including office environments, is symbiotic, meaning that the environment influences their behavior, desires, motivation, resolve, and pride (Kopec, 2006). Design thinking deploys empathic problem-solving principles that extend beyond the typical interior design approaches to office space design and planning. Design thinking methodology channels our client’s behaviors, desires, motivation, resolves, and pride to discover the wicked problem and create solutions that best fit the client’s situation.

This study sought to look at these relationships using key design thinking methods of Fly-on-the-Wall Observation, Affinity Clustering, Questionnaire, Contextual Inquiry, and Prototyping to create an improved success level for the deployed open office workspace environments within a federal law enforcement agency.

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Based on the baseline results below, we have achieved a surprisingly positive high score off of the round of testing within our key areas of productivity, security, storage, and collaboration. We do show areas such as privacy and focus that could use some improvement strategies as well.

Part One:

We conducted Fly-on-the-Wall Observations at location A in Atlanta, GA and directly observed 57 individual workspaces within a multiple unit section of one floor with about 20 percent

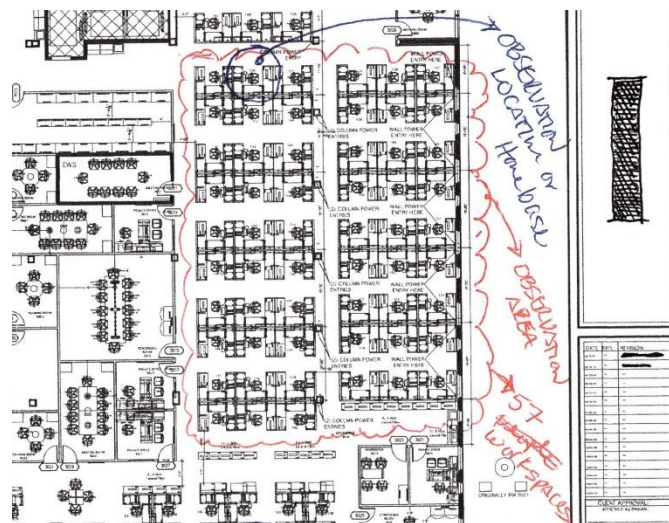


Figure 23 – Fly-on-the-Wall Observation location

of these vacant (see figure 23). These vacancies could be attributed to people on assignment, vacation, working from an offsite, or just off that day. This area has different functions that provide a diverse group of business actions, which include collaboration and full focus “heads down” activities. We conducted these observations for a full 8-hour work day. Our limitations were that we were not allowed to talk to the individuals other than general greetings and basic elevator conversations. We were not allowed to ask specific

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questions about what these people do, or any question that would place us in a security violation situation. All of our observations were non-participatory.

Once the observations were complete, the data was analyzed using Affinity Clustering to create groupings and common themes identified below.

1. Thirteen ($n = 13$) people were observed carrying at least two large bags (backpacks, purses, briefcases, lunch bags, etc.) to work daily (adequate storage).
2. Forty ($n = 40$) people arranged their desk in a neat and organized manner (security). This number is high due to the fact that this is a new facility, so for the first 2 years most people will be neat and organized because of a new space. This is based on historical observation of the past 5-10 large facilities projects.
3. Six ($n = 6$) people had their desk in a disorganized and chaotic manner (security). This is define by having papers, manuals, coffee cups, snack wrappers, and other things all over your worksurface and floor in a non-organized manner.
4. Thirty-five ($n = 35$) people cleared their desk before leaving work daily (security). Their desk is already organized and neat. These individuals were removing the items that they brought that morning.

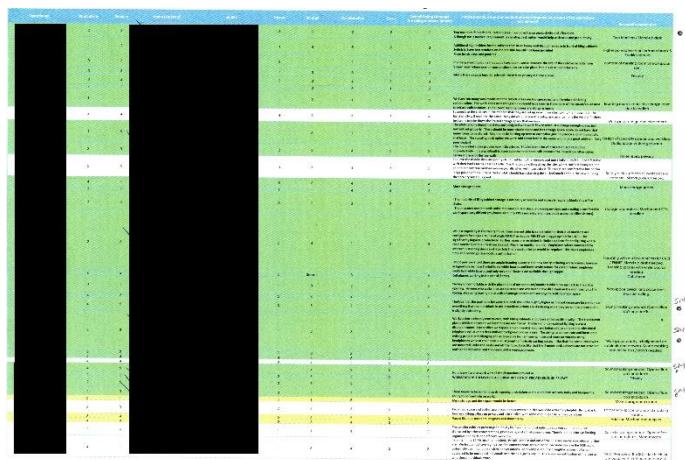
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5. Twenty-three ($n = 23$) people spent more than 4 hours of an 8-hour day reading documents and analyzing data (focus).
6. Forty-six ($n = 46$) people spent more than 4 hours of an 8-hour day on the computer (productivity and focus).
7. Forty-six ($n = 46$) people were observed hand writing notes, memos, comments, and documenting their thoughts (privacy, productivity, and focus).
8. Forty-six ($n = 46$) people were observed talking to others and moving to various meetings throughout the building (collaboration).

The summary of our Affinity Clustering method shows a large concentration of positive actions in the areas of collaboration, productivity, focus work, and security. This finding will help in the revision of the next generation workspace.

Part Two:

The questionnaire was sent out via a secure internal email message to all employees sitting in our recently designed workspaces within specific locations.



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Location A was a recently completed new office building in Atlanta, GA.

Location B was a recently completed new office building in Sacramento, CA.

We estimate that the questionnaire was sent to 350 employees within both office buildings. Participants were given 5 days to complete the questionnaire and return to our mail box. After 5 days, we received 79 completed questionnaires with comments (22.6% response rate) (see Figure 24).

The results of the questionnaire were calculated using weighted average means; this is a more accurate measurement for scores that share an importance to each other.

Field Office	Productivity	Security	Privacy	Storage	Collaboration	Focus	Overall Rating
Atlanta	2.92	3.20	2.08	3.13	3.04	2.60	2.80
Sacramento	3.30	3.50	2.10	2.93	3.50	2.83	3.00
Weighted Avg	3.19	3.38	2.15	2.99	3.27	2.76	2.95

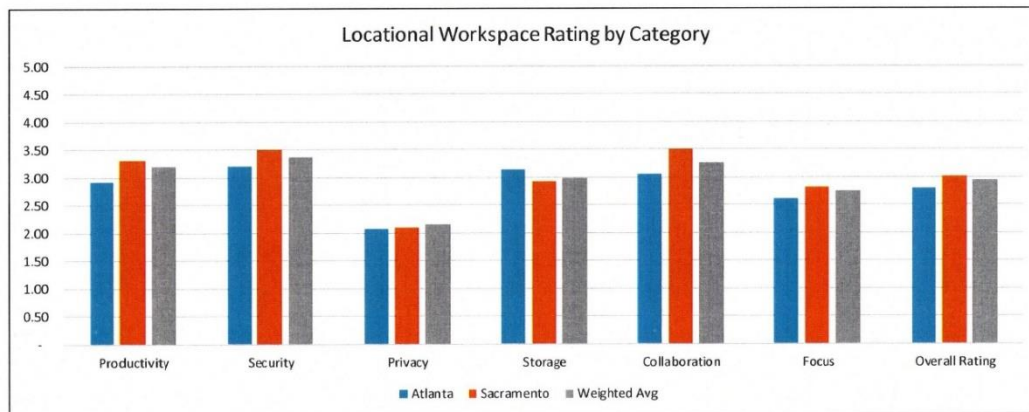


Figure 25 – Questionnaire results. (Note: questionnaire is rated 1 to 5, with 5 being excellent)

1. The total weighted average level was 2.95 out of 5.0 (see Figure 25), which was surprising to my colleagues and me since this was the first

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baseline score. Although the score was high for our first session, we still had areas that needed improvement.

2. Results showed that we are stronger in the areas of collaboration – 3.27, productivity – 3.19, security – 3.38, and storage – 2.99, but present an opportunity for improvement in the areas of focus – 2.76 and privacy – 2.15.

As noted by Congdon, Flynn, and Redman (2014), companies not only need collaborative spaces, but also want areas where their employees can recharge, focus, and think. This combination of focus and collaboration creates the balanced workplace environment and needs to be considered in the next reiteration of systems furniture design.

While focus and privacy were areas of concern, the comments section of the questionnaire revealed the need to provide sound masking or noise

I'm very uncomfortable with the placement of my computer/monitors which has my back to the office opening. Anyone who walks into our space can see whatever I have displayed on the monitors, plus the feeling of security leaving me at a disadvantage since I can't see anyone walking in our space.	Workspace design and placement. Shoulder surfing.	SM
I believe that the partitions between the desk should be slightly higher as it is not necessary for me to hear everything that the individuals in my immediate vicinity are discussing while they are on the phone and it is slightly distracting.	Sound masking needed. Open office do's and don'ts.	SM
Workstation is cheaply constructed, with flimsy cabinets and drawers that easily misalign. The translucent plastic dividers between workstations are also flimsy. The lack of under-cabinet lighting is also a disappointment. Open office workspace environment is loud, and being able to conduct a professional telephone call at one's desk without background noise is rare. The ability to concentrate and focus on a writing project is challenging and as time goes by, I am seeing more and more co-workers using headphones while at their desk in an attempt to mute distracting noises. I like that the computer towers are mounted under the desks and off the floor; I also like that the 2 under desk cabinets are not attached and can be moved to suit the needs of the workspace user.	Workspace quality, misalignment on cabinets and drawers. Sound masking and office do's / don'ts required.	SM
Sound masking needed. Open office		SM

Figure 26 – Questionnaire results comments section

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reduction materials in large open office space (see Figure 26), for sitting and standing or raising or lowering worksurfaces within each workspace, for more storage space and ergonomic product training for chairs, and for keyboard trays and monitor arms. This information provided adequate data and key points of discussion for part three, where we conducted our series of meetings in the locations with actual users of these workspaces. Our limitation on this research was that I was the only observer due to our travel budget and internal re-organization within our agency.

Part Three:

The design thinking strategy of Contextual Inquiry was used to provide a deeper understanding of the items within the workspace that need improvement. This design thinking strategy is heavy on empathic methods and is used to connect more with the client’s emotions about the topic. We invited people who had completed the questionnaire to attend various meetings around an actual workspace to discuss their concerns, comments, feelings, and ways to improve the design. The comments from the questionnaires gave us a foundation for our meetings (see Appendix M for the questionnaire results comments). We also conducted random impromptu meetings with people that were standing around the various workspaces during the general conversation. This provided us with information from actual users with various jobs within

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the agency. This diverse meeting gave us a deeper understanding of how each employee has a strong emotional connection with his/her workspace.

We had four meetings with twenty ($n = 20$) people at location A. The researcher used an “open-ended” question as an ice breaker at all of the locations to engage participants: “What do you like or dislike about the new workspace?” The areas of concern were sound masking / noise reduction materials, optional raise desk features that allow people to stand during the day, additional physical storage outside of the virtual storage products being offered, and ergonomic product training.

The most asked question was about sound masking. A number of people want sound masking to quiet down the office work environment. While the workspaces have sound-masking materials specified within the individual panels, the need for additional products to break up large open spaces where sound travels and vibrates is a concern. This result involves overall interior design of the space and provides valuable data for the design team.

The areas of the workspace that were well received and got the most compliments were collaboration, productivity, storage, and security, corroborating the results from the questionnaire. The success of collaboration contributes to Herman Miller’s (2012) definition of the balanced work environment where collaborative design strategies are equalized with focus

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elements as well. The request for additional sound masking may relate to the need for this focus work. According to Herman Miller (2012), while collaboration is on the rise due to increases in group work and talent to solve complex issues, focus work cannot be neglected. The fact that our employees suggest additional sound-masking features and increased acoustics for a quiet space suggests that our next workstation reconfiguration must employ features for improved employee concentration.

Using design thinking methods to discover the key areas of concern can result in solutions that are spot-on in resolving specific challenges and wicked problems. The key is discovering the root problem or concern and working on ideas that present solutions. Using the combination of design thinking methods showed the research team that productivity was another highly ranked area of success. A well-balanced and designed collaborative space normally could result in a positive feeling within the people working in that space. This positivity in the work force may directly relate to increases in productivity. A positive employee is more likely to stay later and work harder than one who is dissatisfied with the office environment and cannot wait to leave to get to a better environment (Leonard, 2018).

In addition to productivity success, the positive ratings for storage did not surprise the research team. We contribute the success of better storage to

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technology improvements that offer better access to virtual storage products, an agency-wide internal campaign on reducing the use of paper, and the increased use of mobile devices. Security was also rated high, which was not a surprise as this study was done in a federal government law enforcement agency. Security is a high priority for these types of agencies and all employees are fully aware of this important design element.

Conclusion:

Creating a new office environment design solution that everyone is positive about is a daunting task. There are many variables to consider and many methods to follow. The purpose of this study was to use design thinking methods to determine if open office workspace solutions have successfully provided adequate privacy, increased productivity, enhanced security, and deployed efficient storage space for a specific federal government law enforcement agency. The success level of these key elements helped create the definition of a “Balanced Office Workplace Environment” (B.O.W.E.) within this agency. The overall layout of the workspaces, collaboration zones, and focus spaces were all reviewed numerous times with the client during the design phase. This provided ample time for the creation of a balanced office workplace environment specific to the client.

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Based on the results from the observations, questionnaires, and contextual inquiry, we achieved positive results and surprisingly high scores in areas such as collaboration, productivity, storage, and security. However, there are areas for improvement in privacy, focus, and sound masking. The five design thinking strategies of Empathize, Define, Ideate, Prototype, and Test are not meant to be used exclusively once. This strategy provides a pathway to resolving the wicked problems and may take multiple cycles and iterations before we get it right. The surprisingly high results achieved, along with the new challenges discovered, provide the motivation to increase the 2.97 overall score to a perfect 5.0. This research has shown that there is a process to determine the success level of key areas (Privacy, Productivity, Security, Storage, Collaboration, and Focus) within an open office workplace environment.

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Appendix- A (Survey/Questionnaire)

Workspace Questionnaire					
Employee Information					
Department					Date
Job Title					
1. How would you rate your open office workspace environment (workstation) base on the following?					
	1 = Poor	2 = Fair	3 = Satisfactory	4 = Good	5 = Excellent
Privacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments					
Productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments					
Security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments					
Storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments					
Collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments					
Focus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments					
Overall Rating (average the rating numbers above)					
2. Please provide a few comments that would improve your open office workspace environment.					
ADDITIONAL COMMENTS					
Government Building					
Government Building					Date
Address					

MIND MAP

GREEN LIST EACH LOCATION

FIRST LOCATION - FIRST PROTOTYPE

LOCATION A

- 1ST GEN 5X8 OPEN OFFICE WORKSPACES
- 50 PEOPLE USING THESE WORKSTATIONS
- OPEN FLOORPLAN WITH VERY LITTLE PRIVATE SPACES

SUCCESS LEVEL

ONLINE QUESTIONNAIRE

LOCATION C

- 3RD GEN 5X8 WORKSTATION DEPLOYED AS A PROTOTYPE SPACE

SUCCESS LEVEL

3RD PROTOTYPE AT 3ND LOCATIONS

LOCATION D

APGE FACILITIES

- 3RD GEN 5X8 WORKSTATION
- OVER 800 PEOPLE TO TEST
- OVER 7 DIFFERENT ENVIRONMENTS WITHIN ONE BUILDING USING THIS VERSION OF THE WORKSTATION IN OPEN OFFICE ENVIRONMENT
- BUILDING DESIGN IS NOT OUR TYPICAL DESIGN

SUCCESS LEVEL

KEEP MAKING CHANGES TO THE PROTOTYPES AS WE RECEIVE RESPONSES

HOW MANY LOCATIONS DO WE NEED DATA FROM TO GET A TRUE SUCCESS LEVEL READING?

WHAT'S THE TARGET USEABLE SQUARE FOOT NUMBER PER PERSON IN REGARDS TO THE PRESIDENTIAL EXECUTIVE ORDER

2ND LOCATION - 2ND PROTOTYPE WITH IMPROVEMENT

LOCATION B

- 2ND GEN 5X8 OPEN OFFICE WORKSTATIONS
- 100 PEOPLE USING THESE WORKSTATIONS
- 3 DIFFERENT DEPARTMENTS
- PAPER INTENTS ENVIRONMENT

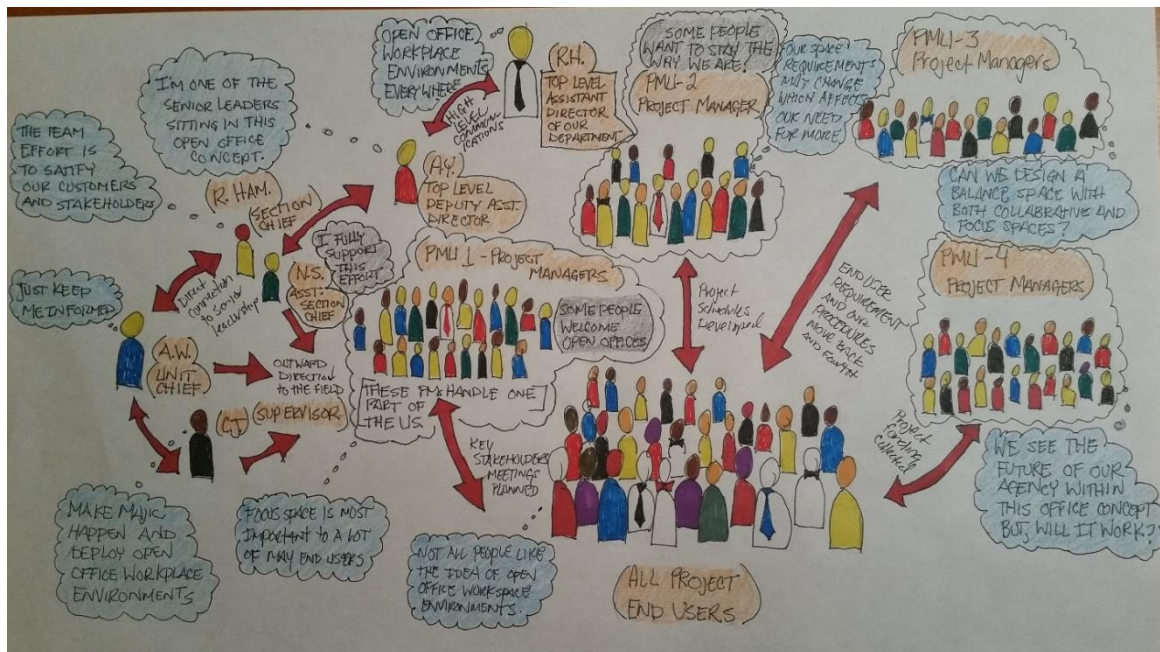
SUCCESS LEVEL

BT. J. H. K.

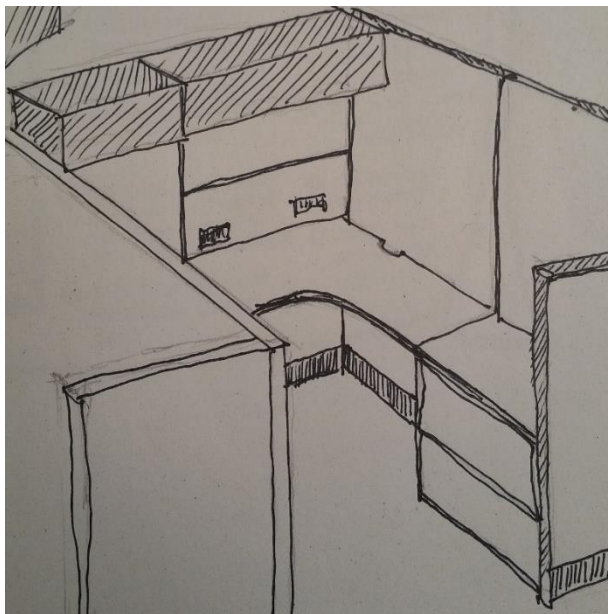
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Appendix- D (Stakeholder Mapping)

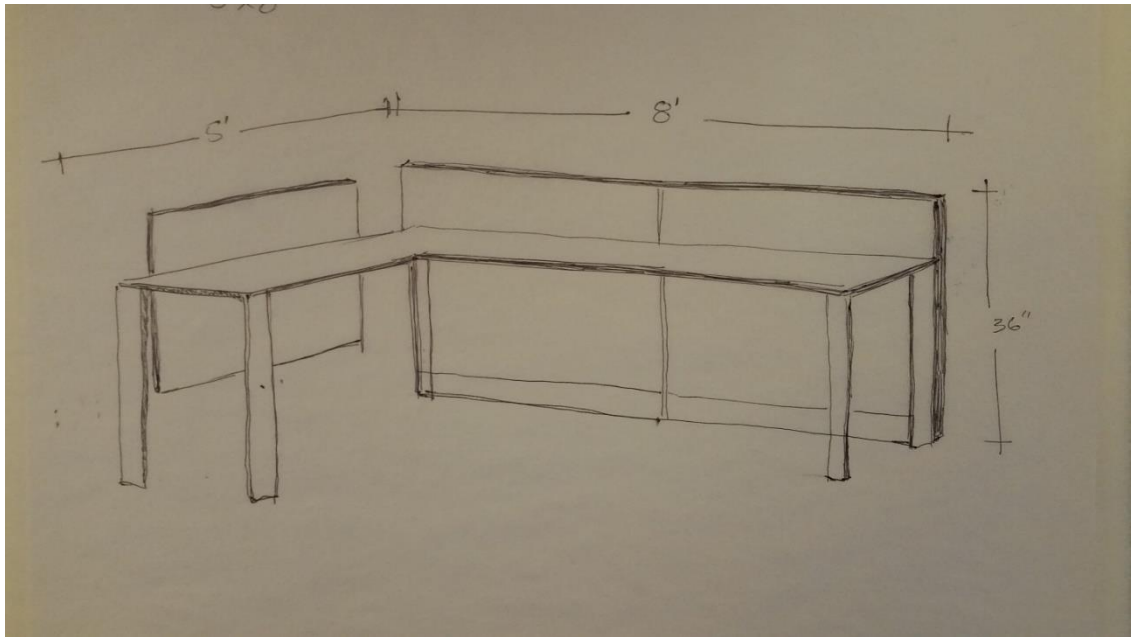


Appendix- E (Old System Furniture Workspace)

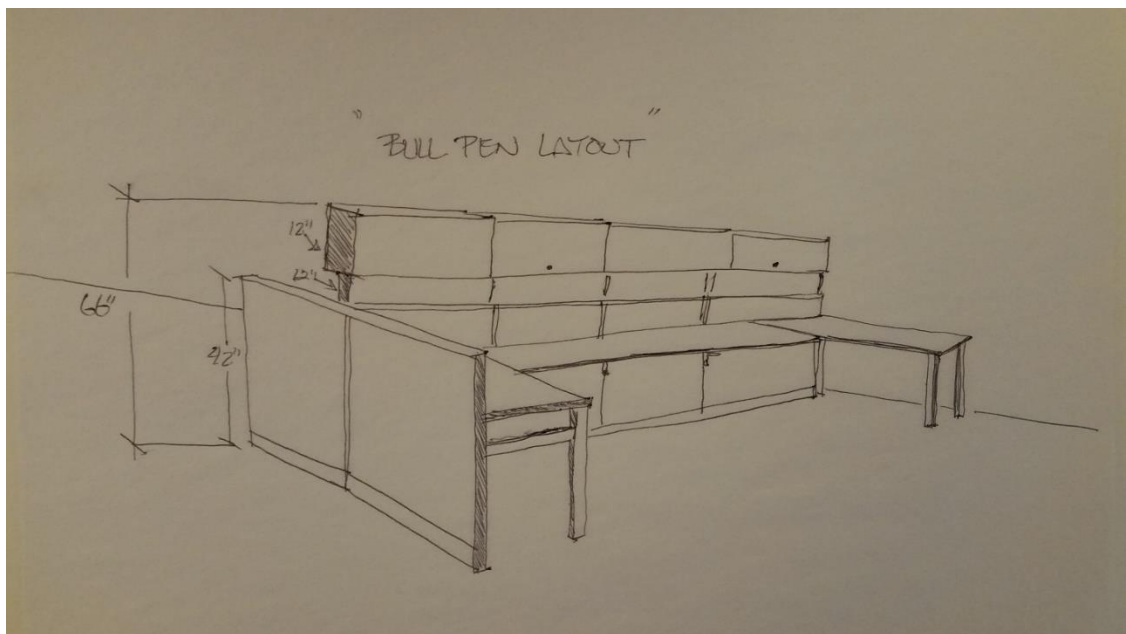


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Appendix- F (First Generation Workspace)

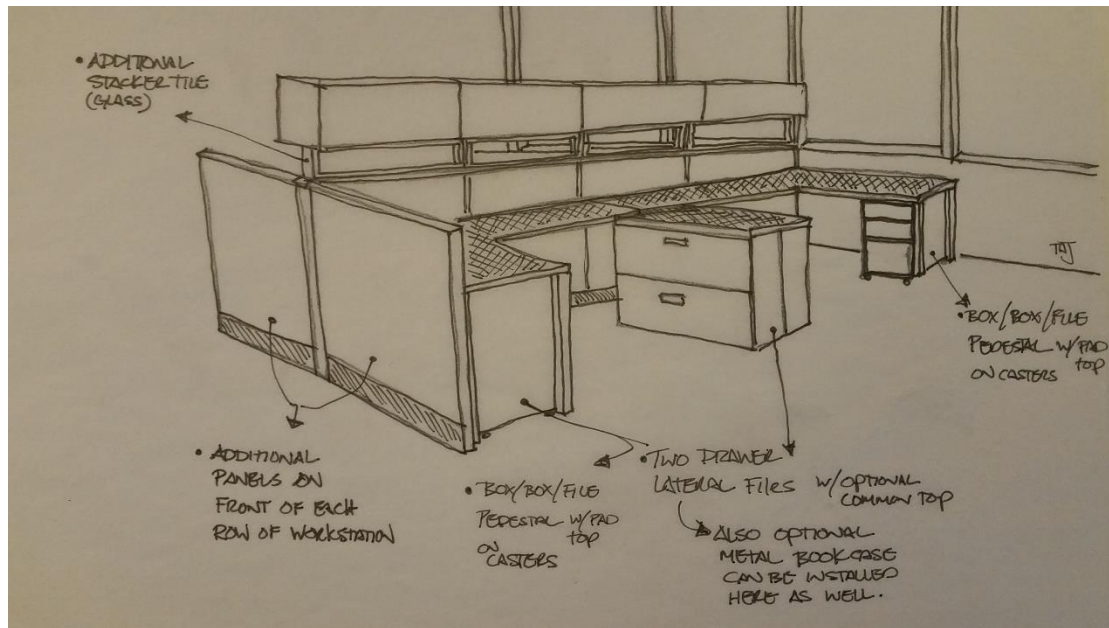


Appendix- G (Second Generation Workspace)

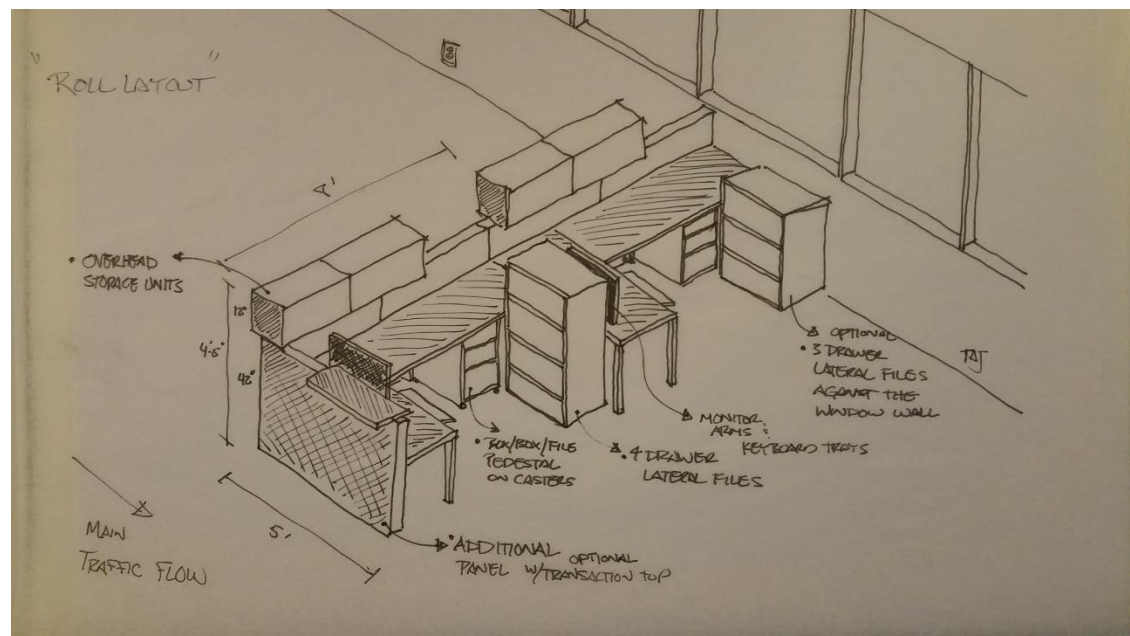


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Appendix- H (Third Generation Workspace)



Appendix- I (Fourth Generation Workspace)



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Appendix- J (Fourth Generation Workspace Prototype)



Appendix- K (Fourth Generation Workspace Prototype 2)



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Appendix- L (Fly-on-the-Wall Observation Card)

User No. _____ Fly On The Wall Observation Card Time _____

Directions: Note where your observation target is sitting. Observe the target for 4 hours each day for a week and note or comment (use additional cards if needed) on behavior that is centered around privacy, productivity, security, storage, collaboration and focus.

Notes:

Sample note: Target 001 was observed hanging in garment bags with a change of clothing for federal court 3 times this week and not having space to storage these items.

Comments: _____

Comments: _____

User No. _____ Fly On The Wall Observation Card Time _____

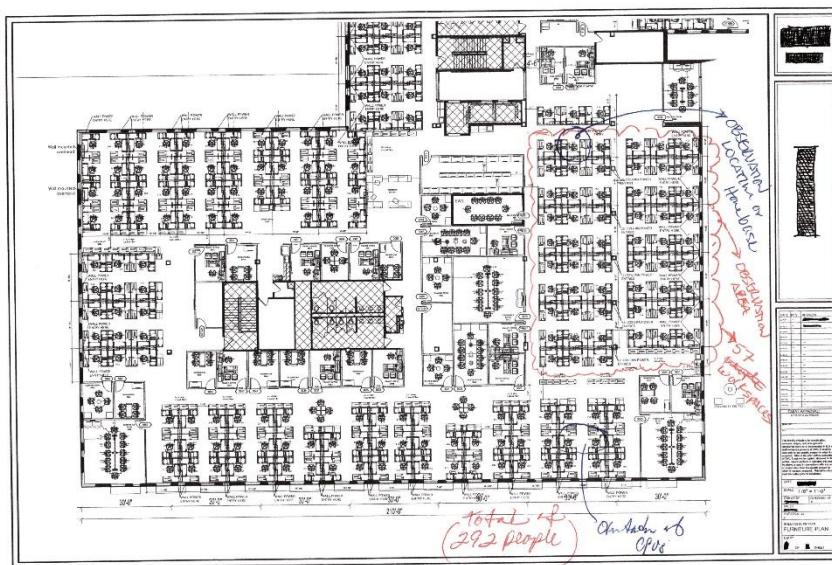
Directions: Note where your observation target is sitting. Observe the target for 4 hours each day for a week and note or comment (use additional cards if needed) on behavior that is centered around privacy, productivity, security, storage, collaboration and focus.

Notes:

Observation target 002, was observed needing privacy for focus work such as writing reviews on financial documents. He was observed being distracted on many occasions. He is the target of this Fly On The Wall observation session.

Comments: _____

Comments: _____



Appendix- M (Questionnaire result comments – sample)

[illegible]