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Connecting the Physical and Psychosocial Space to Sandia's Mission

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Connecting the Physical and Psychosocial Space to Sandia's Mission

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Abstract

Sandia Labs has corporate, lab-wide efforts to enhance the research environment as well as improve physical space. However, these two efforts are usually done in isolation. The integration of physical space design with the nurturing of what we call "psychosocial" space can foster more efficient and effective creativity, innovation, collaboration, and performance. This paper presents a brief literature review on how academia and industry are studying the integration of physical and psychosocial space and focuses on the efforts that we, the authors, have made to improve the research environment in the Cyber Engineering Research Lab (CERL), home to Group 1460. Interviews with subject matter experts from Silicon Valley and the University of New Mexico plus changes to actual spaces in CERL provided us with six lessons learned when integrating physical and psychosocial space. We describe these six key takeaways in hopes that Sandia will see this area as an evolving research capability that Sandia can both contribute to and benefit from.

ACKNOWLEDGMENTS

This work would not been possible without the support from Center 1400 management: Rob Leland (director), LeAnn Miller (senior manager), and John Wagner (manager). We also have been encouraged by the participation of the Cyber Engineering Research Lab (CERL) occupants in this research endeavor. Finally, Jeff Tsao (1120) has helped tremendously through his coordination of the Art and Science of Science and Technology Forum and Roundtable, hosted by Sandia Labs in July 2013. This SAND Report is concurrent to the Forum and Roundtable's conference proceedings:
http://belfercenter.ksg.harvard.edu/publication/23766/art_and_science_of_science_and_technology.html.

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NOMENCLATURE

CERL	Cyber Engineering Research Laboratory
DOE	Department of Energy
Sandia	Sandia National Laboratories

1. INTRODUCTION

This topic of connecting work performance to the work environment first became of interest when Group 1460, Information and Cognitive Sciences moved to a new research environment. The group was relocated to the Cyber Engineering Research Lab (CERL) building, located in Sandia's Science and Technology Park. CERL's major goals target interdisciplinary science and internal/external collaboration. Although already existing projects and programs were collaborative and interdisciplinary, we (the authors) felt like CERL's research environment could be improved to better serve 1460. This stimulated the current research endeavor. We aimed to enhance the working research environment by focusing on the infrastructure that would support not just the individual researcher but the community of researchers.

The purpose of this report is to discuss how we have leveraged existing empirical literature, conversed with experts in the field, and conducted pilot research projects to address how Sandia could improve its craft of science by enhancing the physical and psychosocial work environment.

At the start of 2013, we shared this research idea with Center 1400 management and were provided with the opportunity and funding support to enhance CERL's working environment. To date we have met with Sandia's management, over 100 staff members, and experts in the field from industry and academia (e.g. David Haygood, Vice President of IDEO) to understand various elements of the working environment. We have also changed the physical working environment in two strategic areas in CERL, collected data from CERL's occupants on work community and satisfaction, and nurtured activities that enhance the psychosocial space (we define this term below).

The aim of this paper is to inform and discuss:

1. the activities that have been accomplished to date,
2. the lessons learned
3. the nature of this evolving research capability, and
4. burgeoning research pursuits.

ABOUT THE AUTHORS

Austin Silva has academic training in electrical engineering and educational neuroscience.

Glory Emmanuel has academic training in experimental/quantitative psychology and business management.

The **integration of these disciplines** has allowed this team to approach this topic from multiple perspectives (e.g. technical staff, management, facilities, human resources).

2. LITERATURE REVIEW

Our review of the empirical literature as well as visits to companies famous for their approaches to space taught us that there are two types of space: physical and psychosocial.

- **Physical space** is the actual appearance of a working space, its infrastructure, and the resources available to support its workers.
- **Psychosocial space** is the atmosphere in a building that motivates employees to achieve their best, become experts in their field, and collaborate with their colleagues.

Regarding the research literature on physical space, Marquardt, Veitch, and Charles (2002) discuss how features of furniture design and layout communicate a company's mission and, therefore, should be tailored to help employees achieve that mission. Three areas are specifically addressed by physical space arrangements: 1) physical and task needs [e.g. location, furnishings, chairs, storage, and adjustability]; privacy needs [e.g. partition, shape, and height]; and need for recognition, which is the space one has to display personal items, furnishings, and equipment reflective of one's status. Haynes (2007) connects the physical environment directly to productivity, "It is the behavioral environment that has the greatest impact on office productivity" (p.97). He argues that layout and resources dynamic elements that can either influence employees to interact, or serve as distractions that positively and negatively influence productivity. Leaman and Bordass (2005) estimated that the impact of the physical infrastructure of office space on employees' personal *productivity is estimated to be approximately 20%.* These findings in the open literature are elements within Sandia's environment. Space is a significant part of the reward structure at Sandia. Employees are provided with more personal space through private offices and better furnishings (e.g. having a window or a couch) as they are promoted. Buildings with specific layouts may also be assigned to certain programs to enable the technical work. Therefore, physical space is an element that can communicate how employees are performing as well as reflect how employees are interacting.

The research also discusses psychosocial space, which has been found to be equally if not a more critical component of the working space. Davis, Leach, and Clegg (2011) reviewed contemporary and emerging issues in the work environment. Their review of the literature found that the office environment has a powerful role in shaping a diverse range of psychological and behavioral outcomes, including individual work motivation (e.g., Oldham & Brass, 1979), job satisfaction (e.g. Veitch, Charles, Farley, & Newsham, 2007), and patterns of interactions (e.g. Ives & Ferdinands, 1974; Sundstrom & Sundstrom, 1986). Interaction between coworkers and teaming has also been found to enhance the working environment. "TeamSpace" is a term that has been defined as a collaborative workspace system to support work that transitions between individual through, social interaction, working meeting, and forward progress. TeamSpace fosters awareness of team activities and is supported by the physical environment through communication tools and distinction between different types of spaces. It also helps to facilitate intentional and serendipitous interactions (Fush, Poltrock, & Whetzel, 2001). Emotions such as happiness also positively impact organizations' environment. Yano, Lyubomirsky, & Chancellor (2012) found that people who are happy also report higher levels of creativity, productivity, and earn higher salaries because they are better equipped to take advantage of their mental states (also see Robertson, 2011). In the past Sandia has fostered psychosocial space through its

emphasis on multidisciplinary teaming through LDRDs and community engagement (e.g., United Way program). Sandia has more recently begun to explicitly address the psychosocial space by formally rewarding model behaviors. Model behaviors encourage employees to think strategically, be flexible and supportive in changing environments, team with others, and act with excellence and integrity.

Haynes (2008) has studied the interaction between the physical and psychosocial environment. He developed a validated theoretical framework for the evaluation of office productivity that is comprised of two components. The first represents the physical aspects and the second includes the behavioral (psychosocial) components of the environment. Using two large datasets, he found that interaction between colleagues was the primary work component that most positively affected productivity. Distractions were found to be the most negative. The results of Haynes' work provide support for this paper and the overall hypothesis that it is the behavioral components of the office environment that have the greater impact on office productivity. Although Sandia has addressed physical and psychosocial space, it is most often done in an isolated manner. There is opportunity for Sandia to integrate the two areas in order to advance the creativity, innovation, and collaboration conducted in its research environment.

Concurrent to empirical literature, the greater public is recognizing that enhancing physical and psychosocial space positively affects companies' productivity and performance. In 2013, both the *New York Times* and the *Wall Street Journal* reported on advancing work spaces. One article, "In Defense of Collisions in the Workplace" [NYTimes, March 27, 2013], discussed the floor plan of the company *What If!*. What If! has two types of working environments: the Beehive and the Library. The Beehive has open table seating in order to produce "collisions," or unexpected communication between people who do not otherwise communication, to cross-pollinate ideas. The Library is a place that nurtures a quiet, deep thinking, focused atmosphere.

Another article, "Engineering Serendipity" [NYTimes, April 5, 2013], discusses Silicon Valley's approach to creativity. Engineering serendipity refers to the mysterious means by which ideas enter the world. The NYTimes maps out 5 principles that enable organizations to foster this type of creativity:

1. maximize "casual collisions of the work force
2. rooftop cafes will offer additional opportunities for close encounters
3. no employees in the complex will be more than a 2.5 minute walk away from one another
4. a MIT study showed you are four times more likely to talk to someone size feet from you than 60 feet from you, and almost never with colleagues in other buildings
5. structural holes are created when colleagues are consistently out of sight, and therefore out of mind.

"Tracking Sensors Invade the Workplace" is another article published by the Wall Street Journal [March 7, 2013] which discusses how sociometric badges and sensors are used to quantify attributes of positive and negative working environments. Data representing 50 large companies revealed that the most productive workers belonged to close-knit teams and spoke frequently to their colleagues. Also, *productivity increased by an average of 10%* when groups scheduled

breaks into their meetings. A strong relationship was found between higher productivity and face-to-face interactions. One company found that social activity dropped during lunch since many would retreat to their desks. To address this, the company remodeled their cafeteria with better lighting and better food as well as created a 3pm daily coffee break to boost sagging energy levels and promote interaction.

- **Physical space** is the actual appearance of a working space, its infrastructure, and the resources available to support its workers.
- **Psychosocial space** is the atmosphere in a building that motivates employees to achieve their best, become experts in their field, and collaborate with their colleagues.

3. INTERVIEWS WITH EXPERTS IN THE FIELD

After reviewing the research literature and media communication, we scheduled tours and meeting with management at IDEO, Google, Stanford's design school (the d.School), and the University of New Mexico's School of Architecture and Planning. These organizations were targeted due to their reputation for addressing the physical and psychosocial aspects of workspace. IDEO is a company that has the mission to design space using a human-centered approach that enables organizations to integrate the needs of people, the possibilities of technology, and the requirements for business success. We met with IDEO's Vice President, David Haygood, and learned that it is important to tailor the design of space to a collective people, not to the physical infrastructure, traditional expectations, or individual's needs. From Stanford, Executive Director of Interaction Design Research at the Center for Design Research, Wendy Ju showed us that information can be protected through movable, transfigurable workspaces. The use of transportable, hand-carry whiteboards, for instance, allows an initially open topic to become a protected idea by moving the board to a private space. At Google, we were impressed by the facility, the impact of accessible (and free) food, and the loyalty employees expressed towards Google. However, we learned through this visit that Sandia has very different goals and strengths from Google and other industry organizations. While Google is content with their 3 to 5 year turnover rate and spending billions of dollars on extravagant spaces and luxuries, Sandia is devoted to innovative solutions for national security as well as offers work-life balance and long-term career planning. Lastly, we visited UNM's School of Architecture and Planning and learned the importance of mentorship, expectation, design feedback, and reward-structure. The building is designed so that students can display their work for feedback, professors can give oral exams to classes as visitors are passing by, and seniority is instituted by the location of your workspace: senior students are on the top floor and younger classes strive to achieve top floor status over time.

From our visits to these organizations, the primary lesson we learned was that although elements could be drawn from these various organizations Sandia has its own unique organizational mission and values. Instead of mirroring other businesses' models for space, Sandia needs to tailor its approach to enhance its personal research and mission impact.

After visiting these four organizations, we used the principles we learned to begin efforts to enhance the working environment. In CERL, we designed and constructed the two physical spaces to use as experimental platforms for examining how space affects innovation, creativity, collaboration, and performance. These are described in the subsequent section.

4. THE COOP AND THE BRIDGE

Every summer, Sandia often has a large influx of students that requires access to computer equipment and storage. The existing student area in CERL included 12 cubical spaces that were sequestered from one another, creating a sense of isolation. Some of the students in their spaces reported never having met their neighbors through the tall cubical walls. There were two motivating factors to change this area: 1) to create more space to accommodate the growing inflow of summer students, and 2) to design a space where students would be able to interact with one another and build community as well as share ideas more freely.

The cubicles were reimagined to consist of two open space areas where the seating and communications links would be situated on the outside, leaving the middle area space for a table where group/communal work could be performed. Figure 1 shows the newly designed layout. Although the primary purpose of the space was to accommodate more students and provide a more open, collaborative working environment, when the students were gone, Sandia's researchers could also utilize the space as an ad-hoc scrum room. This space was entitled "The Coop" as a dual-function definition. The Coop can mean "The Cooperative (aka the "Co-Op"), meaning a cooperative society, business, or enterprise, as well as the "Coop," which is an area full of energy, activity, and production.

CERL is divided into two building wings with minimal crossflow. The second space that was renovated in CERL was also a reconfiguration of cubicle space situated between the two building wings. This space was entitled "The Bridge" because it serves as a bridge between the two wings of the building and alludes to a command center, such as Star Trek's Enterprise. The design offers communal space that fosters informal collaborative work without the hassles of scheduling standard conference rooms. The space is highly configurable with movable, colorful seating block, and various levels of technologies to express your ideas to others. There are paper easels, easy connect monitors for laptop screen sharing, as well as hanging whiteboards that can be stored in personal offices to protect OUO information. Figure 2 shows The Bridge.
These two spaces are dramatically different from the traditional appearance of Sandia's working space. They are not viewed solely as physical space but as areas that can leverage its physical attributes to foster the psychosocial space.

5. **A VISION AND A NEW RESEARCH CAPABILITY**

It is difficult to report quantitative and measurable data that demonstrates how the changes to CERL's research environment have impacted the quality of 1460's technical work. Open research in this area at large is also limited and domain specific. Using the principles that we have learned along the way in conjunction with the positive feedback we have received from the residents and visitors of CERL, we foresee an opportunity for Sandia to nurture a new research capability that targets the impact of the physical and psychosocial space on performance in the workplace. Sandia also has such different requirements, conditions, and policies than what is being studied in industry and academia, which provides an opportunity to perform novel research in this field. This could further lead towards the improvement across other DOE and sister organizations. With current investments in the cognitive sciences, Sandia's research environment through the Chief Technology Officer's (CTO) area, facilities management, and human resources (specifically hiring/retention), Sandia can leverage existing personnel and spaces to conduct human subject research.

As indicated by the media articles mentioned earlier, industry and academia are integrating physical and psychosocial space to improve their working environment. However, there is still relatively little empirical research to provide a scientific rigor to validate findings. Sandia should enter into this research space to 1) enhance its own research environment to more efficiently and effectively foster collaboration and innovation; and 2) because it has the resources as well as a unique mission space to empirically contribute to this knowledge space.

6. THE SIX MAIN TAKEAWAYS – LESSONS LEARNED

This endeavor has profited in two new adaptive spaces for CERL and momentum for Sandia to think differently about the research environment. We have also learned lessons along the way that has shaped how to tailor physical and psychosocial space in a manner that is unique to Sandia. We outline six key takeaways, which were presented at the Fall Leadership Forum in November 2013. Each of these is defined in greater detail below.

Six Key Takeaways

1) Address the physical and psychosocial space
2) Design spaces that maintain various types of personal and collaborative spaces
3) Use a "Moneyball" strategy
4) Utilize research to support and enhance the researchers' research
5) Cross all levels horizontally and vertically to be fully integrative
6) Obtain resources

6.1. Address the physical and psychosocial space

When we first approached the research environment, we were focused on updating the physical space. Our approach came from a "build it and they will come" mentality. We realized very quickly how inaccurate this was. We began to incorporate new activities in CERL to build community. At our first communal activity, "Communi-TEA" which asked CERL occupants to meet in the breakroom for 20-30 minutes every other Thursday to discuss solutions to specific CERL issues, we initially had very low attendance. This began to grow as we had face-to-face conversations encouraging people to attend. Concurrently, we hosted a pie competition for March 14^{t} - Pi-Day. We personally went to each office and invited everyone in the building. The turnout was about 80% of the building occupancy. This was our first impression of how trust and community towards the research environment needed to be nurtured. It was not just about changing the building's physical appearance but personally engaging individuals.

We also conducted a building survey (endearingly entitled "CERL-vey") where 1460 staff filled out three questionnaires in May 2013 and then again in November 2013. Results from this showed that there is a very strong, significant relationship between work environment/community and work satisfaction; work environment/community was found to be a predictor of work satisfaction; 1400 staff have not been reportedly impacted by the current CERL environment changes; and overall, work satisfaction and work environment/community are multifaceted constructs.

6.2. Design spaces that maintain various types of personal and collaborative spaces

When we first started this research and began interviewing the occupants of CERL, one of the most common sentiments was that people are afraid to have their offices revoked and turned into open offices with hot seating (first-come-first-served seating arrangement). One of the reasons

why people get very defensive about maintaining their personal offices is that Sandia has made offices and space as a major part of the reward structure. A window office can be a way of saying that an employee has a high status and performed well to earn their office space. If we want to change the research environment to be more collaborative and open, Sandia must slowly alter the reward structure. Private offices can be an incentive for good work, but other reward structures can be established to reward teaming, collaboration, and interdisciplinary science, such as being awarded well-designed team space areas. Updating the reward structure for space is in alignment with Sandia's corporate Strategic Objective #5, which states the goal to create a more productive "learning, inclusive, engaging environment for our people".

Additionally, rather than thinking of employee's "office/labspace" solely as personal space, we believe more emphasis should be placed on the summation of an employee's personal space and communal space. Personal space has designated storage and controlled access. On the other hand, communal space is space that is open for any occupant or visitor to use. The lobby and break room are only a small fraction of what some buildings have as communal space. By incorporating more communal space within a building (e.g., reading rooms, scrum rooms, and drop-in team rooms) the building occupants' space per user increases.

While writing this report we were initially in a large two person office that was in the center of CERL, difficult to find, and did not have easy access to helpful resources such as whiteboards. We moved to a single person office that was located next to the Bridge. Although the square footage of our personal office space decreased, we have more natural lighting, a larger accessible whiteboard, and are closer to our colleagues. Our overall space feels much larger because we have more functional space and are a few feet from the Bridge which has whiteboards, a standing station, and open informal meeting space.

6.3. Use a "Moneyball" strategy

When we first began this project, it had a dream title of "Out-Google Google." Google is known for drawing highly talented employees because of its innovative and luxurious workspaces. However, after visiting Google and the Silicon Valley area, it was obvious that there are major differences between Google and Sandia's culture. We do not want to out-Google Google because a) we do not have to financial resources, and b) we do not want to mimic Google's culture. Sandia is founded on its commitment to national security, interdisciplinary research for technical excellence, retention of highly talented researchers, and work-life balance. To support this foundation, Sandia can benefit from a "moneyball" strategy.

The "Moneyball" strategy is based on Michael Lewis' book, The Art of Winning an Unfair Game (2003). The book describes the Oakland Athletics (A's) baseball team's analytical, evidence-based, sabermetric approach to assembling a competitive baseball team, despite Oakland's disadvantaged revenue situation. The A's determined its goal (runs) and then built a strategy that focused on acquiring players that collectively would be able to achieve more runs or simply get on base. This was different from the traditional method of buying the most expensive baseball players who solely could make homeruns.

Similarly, Sandia does not have the resources to build lavish facilities and tailor space to single researchers. However, it does have the ability to improve the research environment by choosing

low-hanging fruit to design spaces to nurture innovation and collaboration. For example, food is a huge motivator (one of the few that causes people to drop everything that they are doing to grab a bagel from the break room). We leveraged this principle and arranged for Food Trucks to regularly visit Sandia's Science & Technology Park (schedule is currently coordinated by Alisan Napier). Over 500 employees regularly visit the Food Trucks from in and out of the tech area. This helps to facilitate opportunity for serendipitous collisions and cross-pollination and contributes to Sandia's mission for a connected, energizing environment.

6.4. Utilize research to support and enhance the researchers' research

As research in this area becomes more available and validated, it will prove useful for management and researchers to listen to the data. It is important to have members in each organization that can stay up to date on the latest insights to try to consider their implementations within the existing infrastructure. One caveat to this is the fact that no "silver bullet" exists in the realm of innovation. Just because a modification worked for one location or department there is no guarantee that the same results will be gained for a different team. You must *tailor the approach* to match the type of work you are conducting, and more importantly, the people you are hoping to augment.

As mentioned before, industry is now becoming a large test bed for researchers to gather information from employees. However, the metrics that they are collecting may not be as operationally relevant for a national laboratory setting. For instance, a company may be extremely successful but they do not need to establish a quantitative explanation because their focus is on profits and increased business is their metric of success. Yet, the Sandia culture lives off of quantitative research and validated testing. Therefore, we have an opportunity to develop new metrics and means of capturing the innovative process used at Sandia. Many of the subject matter experts we talked to from industry and academic said that they were looking to Sandia to "figure out the science."

Sandia can accept novel data collection techniques, both qualitative metrics (surveys, interviews, feedback, etc.) and quantitative (sociometric badges, text analytics, etc.), to extend research in this area.

6.5. Cross all levels horizontally and vertically to be fully integrative

We believe that in order to have a fully functioning institution, there must be integration across all levels of the employee. All opinions are needed both vertically (student to management) and horizontally (across colleagues). Management buy-in is crucial since superiors will look to management for cues of behavior. When we had management using our spaces and participating in our feedback sessions not only did it validate support of the research being conducted, it allowed for people to see it was permissible and encouraged in these spaces. Once the "first followers" were established, the project started gaining the inertia needed to propel into the next stages of development.

Receiving input from different levels and experience in the institution offers different insights and helps disband the smoke and mirrors (not to mention policy). Trust was identified to be one of the largest components in the psychosocial space. By developing the space and being

transparent about the outcomes and the design, we were able to develop a communal effort that was able to think big (and realistically scale down) and provide the crucial feedback that made the design work for the specific use case. People do not like change, so if they see how it will benefit them directly, they are more willing to be a part of the process (or at least will not argue against it).

6.6. Obtain resources

Resources are needed to accomplish any sort of change in the research environment. The most common resource is financial support to fund researchers' time to develop meaningful questions and perform the subsequent data collection and analysis. Center 1400 management were highly supportive by providing us with $100K to design two new spaces, visit subject matter experts, collect/analyze data, and launch this research capability. With high facilities and furniture costs, this was a challenge. However, we were able to accomplish our tasks by targeting low hanging fruit and making small but impactful changes (e.g. use of color and whiteboard paint).

There are other non-funding resources that prove to be invaluable in this process of change. Management support can go a long way with establishing new norms through modeling desired outcome behaviors. Openness to big ideas requires a large amount of risk, and with management buy-in that risk is understood as a means of tactful trial and error. For example, to further develop transparency and trust in our changes to both the physical and psychosocial spaces, we designed a website that was inspired by a system at Google called TGIF where staff is able to ask anonymous questions to the CEOs through an anonymous online social voting website. Questions are posted on the TGIF website by all levels of employees (interns to management) and are socially voted up or down. Every week, on Friday, or TGIF day, management answers the most up-voted questions. We have found that implementing that same system here in our center has led to more rich conversation from upper management to staff since they feel they are able to anonymously ask difficult questions.

When the spaces were built we knew that it would take some time before we could truly understand the impact of the building modification. Therefore, the next resource is time. We do not see our spaces as final products, but merely prototypes that are in constant flux depending on who uses them. Even the technologies within a space can be viewed as a prototype when understanding how different levels of fidelity (i.e. paper versus white boards versus digital displays) can change the ways ideas are shared. Understanding the impact of the changes takes time; but it is not time wasted. This time also allows for trust to develop across the research team and those impacted by the changes.

7. CONCLUSION

Overall, Sandia Labs has corporate, lab-wide efforts to enhance the research environment as well as improve physical space. However, these two efforts require a human-centric approach that integrates physical space with the psychosocial space. The integration of physical space design with psychosocial space can foster more efficient and effective creativity, innovation, collaboration, and performance.

In this paper we have presented a brief literature review on how academia and industry are studying the integration of physical and psychosocial space, interviews with subject matter experts from Silicon Valley and the University of New Mexico, and what we have done to date to improve the research environment for Group 1460 in the Cyber Engineering Research Lab (CERL). For a more detailed list, see Appendix A. We further explain six lessons learned when integrating physical and psychosocial space. The key takeaways (Appendix B) are:

1. Address the physical and psychosocial space
2. Design spaces that maintain various types of personal and collaborative spaces
3. Use a "Moneyball" strategy
4. Utilize research to support and enhance the researchers' research
5. Cross all levels horizontally and vertically to be fully integrative
6. Obtain resources

From here we plan to empirically study our initial findings using Center 1400 as our testbed. The goal is to build a research capability that measurably defines the impact space has on overall performance, specifically creativity, innovation, and collaboration. We believe that this will be an area in the short- and long-term that Sandia can both contribute to and benefit from.

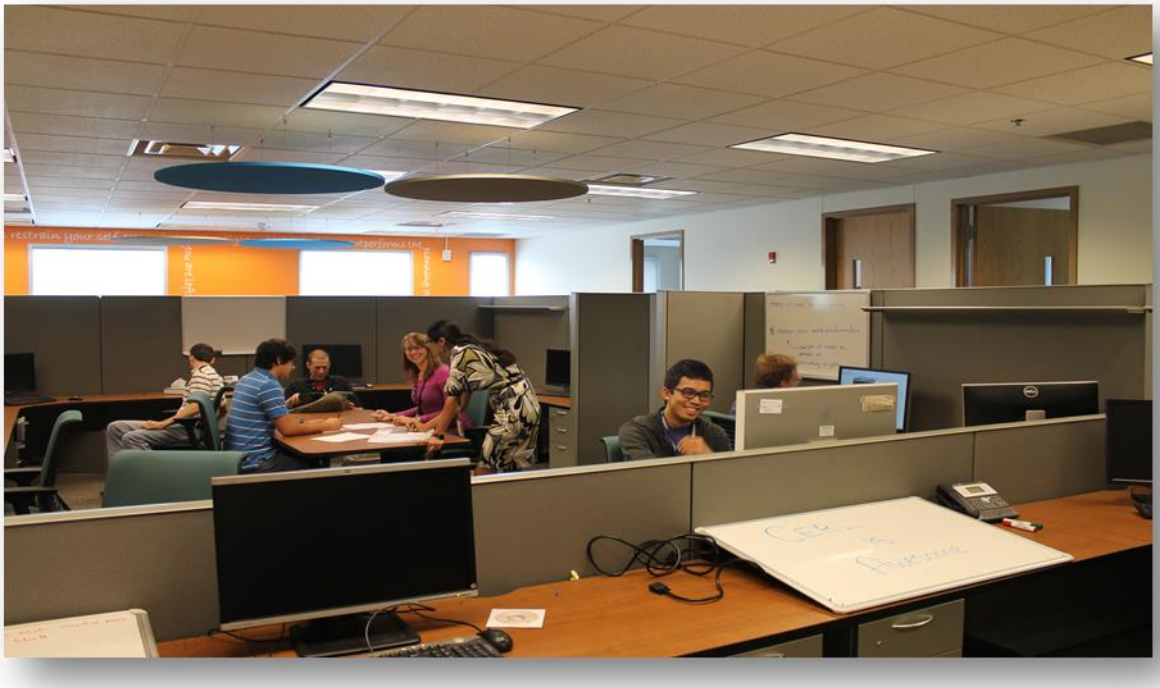

Figure 1. The Coop

Figure 2. The Bridge

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APPENDIX A: TIMELINE OF CERL ACTIVITIES

Feb - April 2013

-Research. External Lit Review, NW Business Office

-Rob Leland gave us access to $100K Facilities Funds

-"Pi-Day" with Personal Invitations

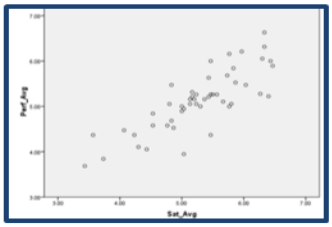
-Postcard Wall, e.g. Interview Candidate Success Story

May 2013

-Visited Google, IDEO, Stanford's d.School. #Moneyball Strategy

-Meetings with Adam Royalty, Scott Witthoft, Sandia CTO Office

-CERL-vey #1



June - July 2013

-Completed construction of "The Coop", Student Feedback

-Communi-TEA, Momentum for 3rd Thursday Lunch

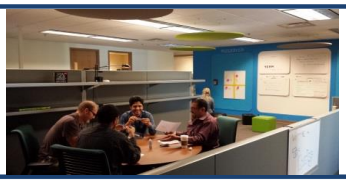
-Art and Science of Science and Technology Workshop

-Gave IDEO CTO personal tour of CERL

-WiFi Upgrades

Aug 2013

- Town Hall Q&A Sites, Inspired by Google



Sept 2013

-Completion of the "Bridge" area

Oct 2013

-Food! Food trucks, Hot cocoa All-hands

-CERL Navigation signs

-CERL-vey #2

Nov 2013 - March 2014

-Presented at Fall Leadership Forum

-Met with CTO Office, S&T Park, B61 Program, Z Machine

-Designing experiment to collect data on team differences

APPENDIX B: KEY TAKEAWAYS

The Focus is on *Psychosocial* Space

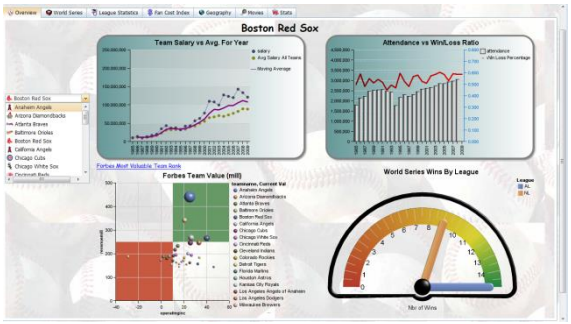
Community	Creativity
Collaboration	Insight
Personal Expression	Innovation

Provide Personal AND Collaborative Spaces

In alignment with SNL SO#5:
Learning, inclusive, engaging environment for our people

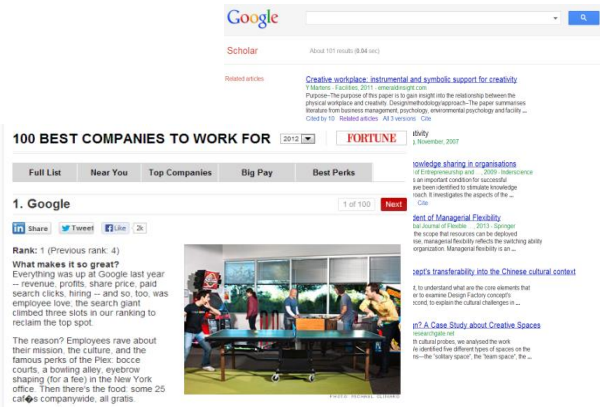
The Moneyball Strategy

Know your mission/goal & connect your strategy to it.



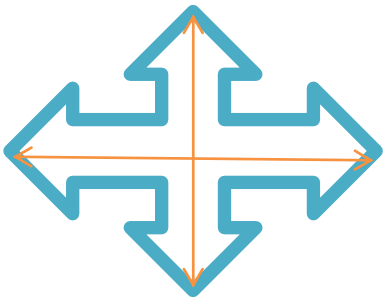
Research-based

Listen to the data. Tailor your approach.



The efforts should cross all levels and be fully integrative.

All opinions needed. Buy-in counts.



Crossing Employee Levels (Student to Management)

Resources Needed

Funds **Nurture over time** **Management support**

Openness to ideas **Think big** **Team effort**

Must use trial-and-error

DISTRIBUTION

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