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# The Office of the Future: A Case Study on Workplace Effectiveness in the Biopharmaceutical Industry

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Submitted to the Program of Organizational Dynamics in the Graduate Division of the School of Arts and Sciences in Partial Fulfillment of the  
Requirements for the Degree of Master of Science in Organizational Dynamics at the University of Pennsylvania  
Advisor: Ana Reyes

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# The Office of the Future: A Case Study on Workplace Effectiveness in the Biopharmaceutical Industry

## **Abstract**

Workplace strategies that incorporate office-of-the-future concepts enhance worker productivity and position organizations for radical changes to the ways work will be performed in the future. Due to the many challenges facing companies in the biopharmaceutical industry, many organizations now seek creative workplace improvements to support their continued success. As organizations assess how best to foster collaboration, knowledge sharing and productivity in the workplace, we are witnessing a seismic shift in this industry. A knowledge-based workforce, connected through globalization and empowered by technology, seeks optimal alignment in order to best maximize innovation.

In this thesis, the contextual landscape of the biopharmaceutical industry is provided, the evolution of the workplace is examined, and a case of an office-of-the-future pilot program at a leading biopharmaceutical company is reported. Related elements, such as cost pressures, collaboration, organizational culture and environmental sustainability are interwoven into this paper to provide a multi-perspective analysis of the evolving ways in which work is performed. Companies who haven't already adopted office-of-the-future concepts should soon examine their workplace strategy.

## **Comments**

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Advisor: Ana Reyes

THE OFFICE OF THE FUTURE: A CASE STUDY ON WORKPLACE EFFECTIVENESS  
IN THE BIOPHARMACEUTICAL INDUSTRY

By:

Matthew P. Walls

Submitted to the Program of Organizational Dynamics  
in the Graduate Division of the School of Arts and Sciences  
in Partial Fulfillment of the Requirements for the Degree of  
Master of Science in Organizational Dynamics at the  
University of Pennsylvania

Philadelphia, Pennsylvania

2012

THE OFFICE OF THE FUTURE: A CASE STUDY ON WORKPLACE EFFECTIVENESS  
IN THE BIOPHARMACEUTICAL INDUSTRY

Approved by:

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Ana Reyes, Ph.D., Advisor

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## ABSTRACT

Workplace strategies that incorporate office-of-the-future concepts enhance worker productivity and position organizations for radical changes to the ways work will be performed in the future. Due to the many challenges facing companies in the biopharmaceutical industry, many organizations now seek creative workplace improvements to support their continued success. As organizations assess how best to foster collaboration, knowledge sharing and productivity in the workplace, we are witnessing a seismic shift in this industry. A knowledge-based workforce, connected through globalization and empowered by technology, seeks optimal alignment in order to best maximize innovation.

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## CHAPTER 1

### INTRODUCTION

Imagine a workplace where knowledge and information flow freely; where the physical space, technology and people converge in a fit-for-purpose manner offering the highest means of collaboration resulting in increased organizational success. These are some of the images and elements of the office of the future.

Since the 1940s, the original office-of-the-future concept has increasingly emerged and, in 2012, presents a value proposition that I argue is compelling (Bush, 1945). This is a concept that has evolved since the 1960s that challenges the fabric of the United States, a once industrial-focused nation to one that has become increasingly information-focused. Economic and environmental pressures are addressed in this matured concept, and there are historical indications that lead me to believe that the current recession is a key contributor to the tipping point for the adoption of the twenty-first century office-of-the-future (see Toffler, 1990).

Specific to the biopharmaceutical (Pharma) industry, many Big Pharma companies (e.g., those with annual revenue >\$3 billion) have responded to the current business climate and recession by engaging in a variety of strategies aimed at optimizing future success. Examples of this are Amgen's (2011) Lab of the Future program, an initiative aimed to optimize productivity within their research laboratories, Pfizer's 2009 acquisition of Wyeth, a move aimed to expand pipeline (product portfolio), and GlaxoSmithKline's presence in China, an 'emerging markets' strategy aimed to significantly reduce manufacturing costs (Sutton, 2011). Others such as Novartis and Johnson and Johnson have strategically diversified by opening business operations outside of the traditional pharmaceutical sector engaging in areas such as animal health,

consumer products, healthcare services and medical devices. These examples of business model adaptations address balance sheet pressures derived from regulatory and legal affairs, stagnant pipelines and delays in product commercialization. The biopharmaceutical industry is facing challenging times and I argue that companies that are able to foster a culture of collaboration and execute on a strategy that allows information to flow freely will be able to have long-term success.

The office-of-the-future concept embraces these contributing success factors and, as outlined by Beinhocker, Davis, & Mendonca (2009) in a paper after the 2008 stock market crash, is aligned to the world's restructured economic order. As other industries, such as the consumer electronics industry, felt similar pressures in the 1990s and thus embraced office-of-the-future concepts, I hold that the biopharmaceutical industry should adopt a seismically-shifted workplace design.

### Purpose of Thesis

This thesis examines the office-of-the-future concept at a leading biopharmaceutical company. It provides some historical context and the evolution of strategies that have been employed while business models continue to change. The thesis concludes that current workplace strategies that incorporate office-of-the-future concepts do enhance worker productivity and position organizations for radical changes to the ways work will be performed in the future.

Of importance, the research and evolution of the workplace in this context is presented through the lens of a strategic sourcing professional. By their very nature, sourcing professionals seek to continuously improve an organization through, but not limited to, total cost and current

spend analyses, supply market assessment and tracking of results stemming from transformative implementations. Additional biographical information on the author can be found in Appendix A as a means of providing context to this thesis and the case presented herein.

The paper includes five chapters, each covering distinct areas as I work towards the conclusion of my research. Chapter 2 provides the landscape of the biopharmaceutical industry and a contextual reference to the case study. Chapter 3 reviews the literature on core elements of the office of the future concept: workplace effectiveness, organizational culture, collaboration, unified communications and environmental sustainability. Chapter 4 presents an ethnographic case study of an office-of-the-future building at a leading biopharmaceutical company. This case highlights the views expressed by subject matter experts on the office-of-the-future concept (interviewees were selected based on their extensive experience in the biopharmaceutical industry including research and development, LEED and Lean Construction); collects the voice of office workers newly relocated to the studied building; documents the behavior of research subjects both within the subject office building and an alternate ‘traditional’ building on the same campus; and translates physical and experiential action-research into an overall summary of the key observations and workplace predictions. Chapter 5 summarizes the findings and offers suggestions for the future.

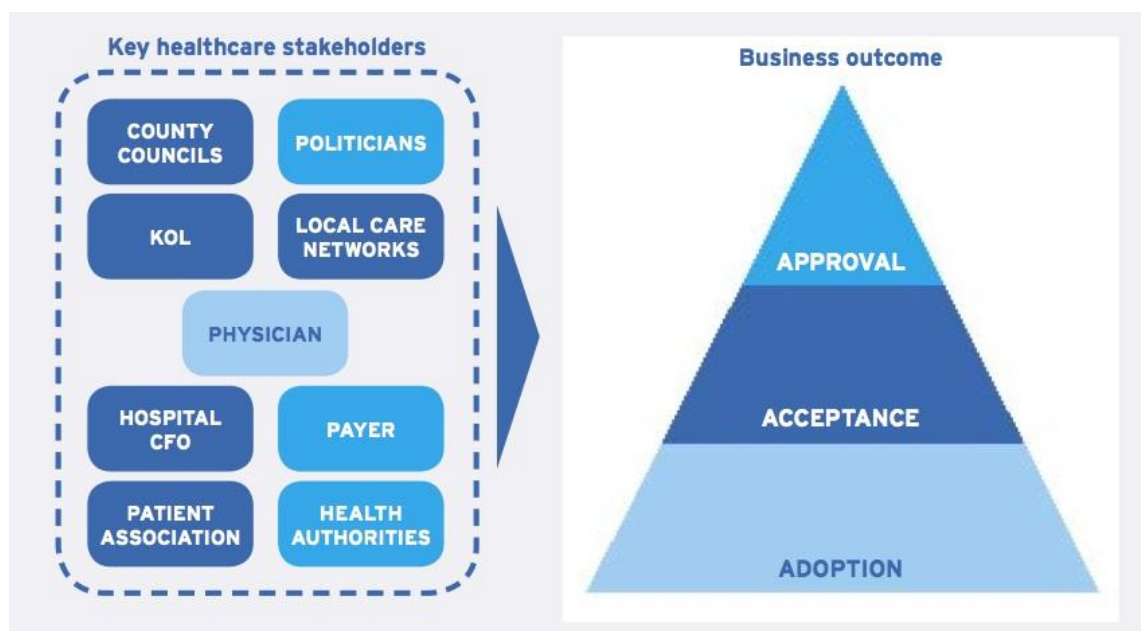
## CHAPTER 2

### BIOPHARMACEUTICAL INDUSTRY CONTEXT

#### Regulatory Context

The recent economic downturn between 2007 and 2011, referred to by many as the Great Recession, has contributed to a heightened review of regulation in the biopharmaceutical industry (Rampell, 2009). In 2011, healthcare reform ensued and a great debate continued surrounding the need for the improvement in the regulatory process to meet the current and future needs of many key stakeholders as depicted in Figure 1 (IMS Health, 2011).

Figure 1. Key Stakeholder Map  
Legend: KOL (Key Opinion Leader), CFO (Chief Financial Officer)



This new era has required Big Pharma to reengineer their cost structures as governments, insurance companies, payers and patients focus on reducing spending on healthcare. Table 1 shows the healthcare expenditure forecast compiled by the U.S. government agency, Centers for

Medicare and Medicaid Services (CMS). In 2010, total healthcare expenditures exceeded \$2.6 trillion dollars for which roughly \$260 billion dollars was spent on prescription drugs, and according to CMS, drug spending is expected to grow annually at a rate of 7.2% from 2015-2020 (CMS, 2009).

Table 1. Healthcare Expenditure Forecast

<b>National Health Expenditures and Selected Economic Indicators, Levels and Annual Percent Change: Calendar Years 2010-2020<sup>1</sup></b>											
	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
National Health Expenditures (\$B)	\$2,584	\$2,708	\$2,823	\$2,980	\$3,227	\$3,417	\$3,632	\$3,849	\$4,080	\$4,346	\$4,638
National Health Expenditures as a % of GDP	17.6%	17.7%	17.6%	17.6%	18.1%	18.3%	18.6%	18.8%	19.1%	19.4%	19.8%
National Health Expenditures per Capita	\$8,327	\$8,648	\$8,936	\$9,348	\$10,035	\$10,535	\$11,099	\$11,664	\$12,259	\$12,951	\$13,708
Gross Domestic Product (\$B)	\$14,659	\$15,334	\$16,071	\$16,891	\$17,803	\$18,712	\$19,573	\$20,454	\$21,396	\$22,380	\$23,388

<sup>1</sup> The health spending projections were based on the National Health Expenditures released in January 2011. The projections include impacts of the Affordable Care Act.

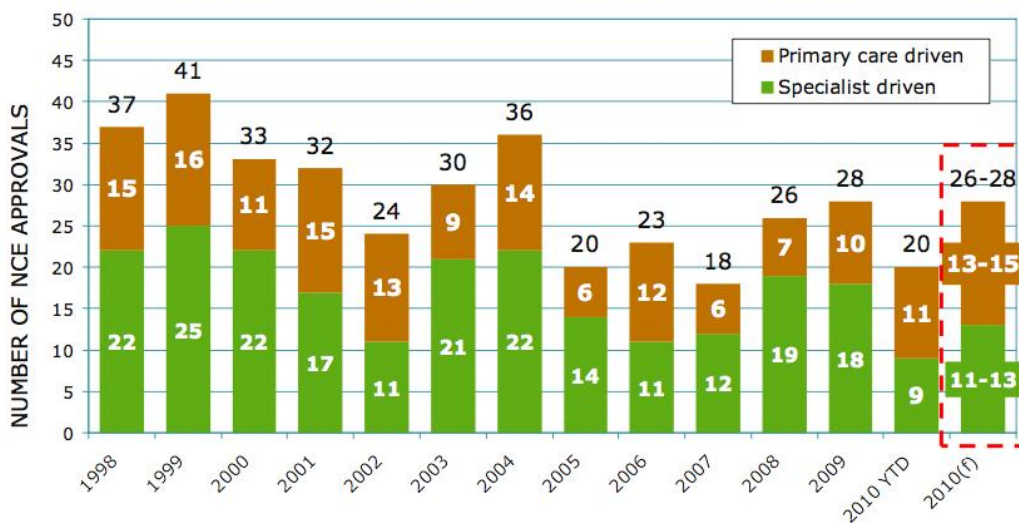
These costs and other related pressures require biopharmaceutical companies to demonstrate the benefits they bring to their patients and other stakeholders. Stated another way, the products they submit for regulatory approval must deliver meaningful value to their patients, especially in instances where the same need/therapeutic area has existing products.

Regulation also impacts other industry stakeholders such as groups campaigning for environmental sustainability and animal rights. These groups often have the advantages of both monetary resources and political mechanisms (e.g. lobbying) that can make it very difficult for biopharmaceutical companies to operate to their full potential. As suggested by Beinhocker, Davis and Mendonca (2009) in a *Harvard Business Review* article entitled, “The 10 Trends You Have to Watch,” the authors emphasize that government involvement in business will continue to increase. As deficits and aging populations rise, governments find themselves under intense pressures to deliver healthcare at lower costs.

### Decline in Approvals and Revenue Performance of New Products

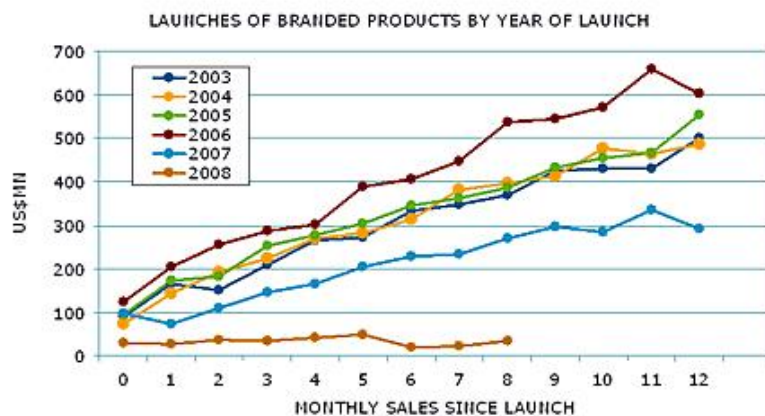
Through the process of early drug discovery, successful drug candidates become known as New Chemical Entities (NCEs). Over the past ten years, research shows that there has been a steady decline in the number of NCEs approved and launched (Figure 2). This phenomenon is occurring across most therapeutic areas and companies and is compounded by the fact that the value of the launches that have occurred are not performing as well than in the years when blockbuster drugs provided significant and immediate increases in revenue (Figure 3). According to IMS (2010), the launch outcomes, as depicted in Figure 3, largely represent the economic pressures from increased availability of generic drugs and resulting changes in brand spending.

Figure 2. NCE Launches for 1998-2010



Source: FDA, IMS Health, Market Insights Team Analysis, Sep 2010

Figure 3. New Product Launch Revenues for 2003-2008



ims

This decline can be attributed to many factors including increased scrutiny and higher safety standards regulated by the Food and Drug Administration (FDA) authorities. Regardless of the reasons, biopharmaceutical companies are faced with the reality of fewer new products. Stating the obvious, patients, shareholders and employees will increasingly feel the impacts of these trends.

### Generic Product Competition

Generic drugs will continue to be a serious challenge for the established Big Pharma companies. Research estimates that it takes ten to fifteen years and \$1.3 billion dollars to bring a new drug to market (PhRMA, 2011). Manufacturers of generic drugs, once the patents expire from brand name drugs, are able to leverage the expertise and investments made by Big Pharma and undercut Big Pharma profit margins within months of production (see Figures 4 and 5). Generic drugs are a permanent part of the market as they offer an attractive cost incentive to patients and payers, and many argue they will contribute towards the reduction of healthcare costs.



Figure 4. R&D Costs for 1975, 1987, 2000 and 2005

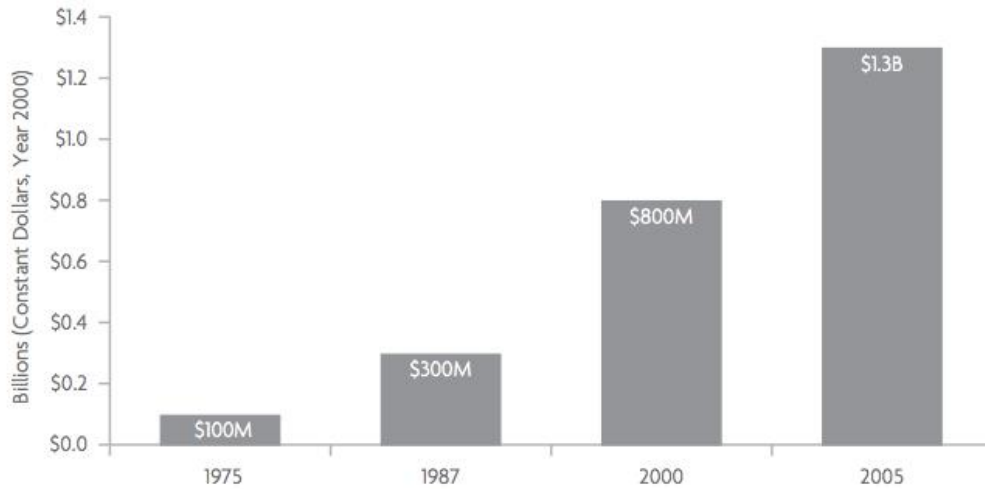
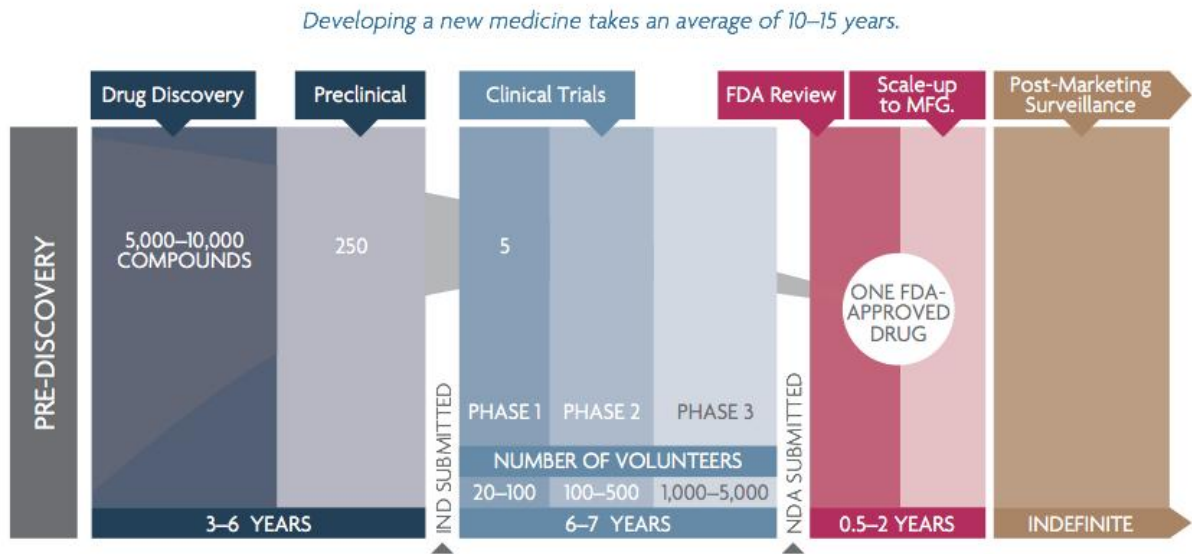


Figure 5. Drug Commercialization Timeline

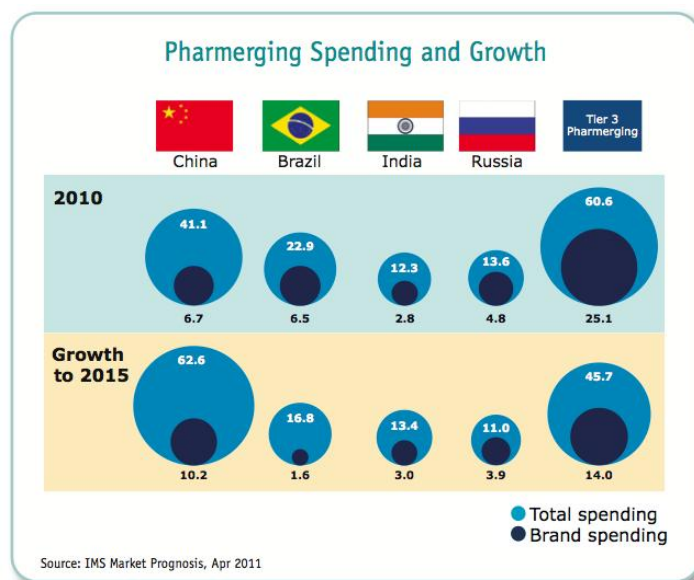


Source: PhRMA<sup>4</sup>

Emerging Markets

As of 2012, the United States is the largest market for biopharmaceuticals; however there is a steady growth of demand in developing countries (see Figure 6).

Figure 6. Growth of Emerging Markets



Many Big Pharma companies are strategically building infrastructure in these regions as they will become significant sources of growth in the years to come. Brazil, Russia, India and China are examples; they are the “BRIC”, countries that are “Pharmerging” ([http://www.imshealth.com/imshealth/Global/Content/Document/Intelligence.360%20Documents/The\\_Pharmerging\\_Future.pdf](http://www.imshealth.com/imshealth/Global/Content/Document/Intelligence.360%20Documents/The_Pharmerging_Future.pdf)) as they still have significant areas where the needs of patients with certain diseases are not being met (IMS, 2011). These and other developing countries define the non-industrialized countries as they have significant economic, political, and other growth potential that are now being included in biopharma’s business planning in order to preserve domestically declining revenues.

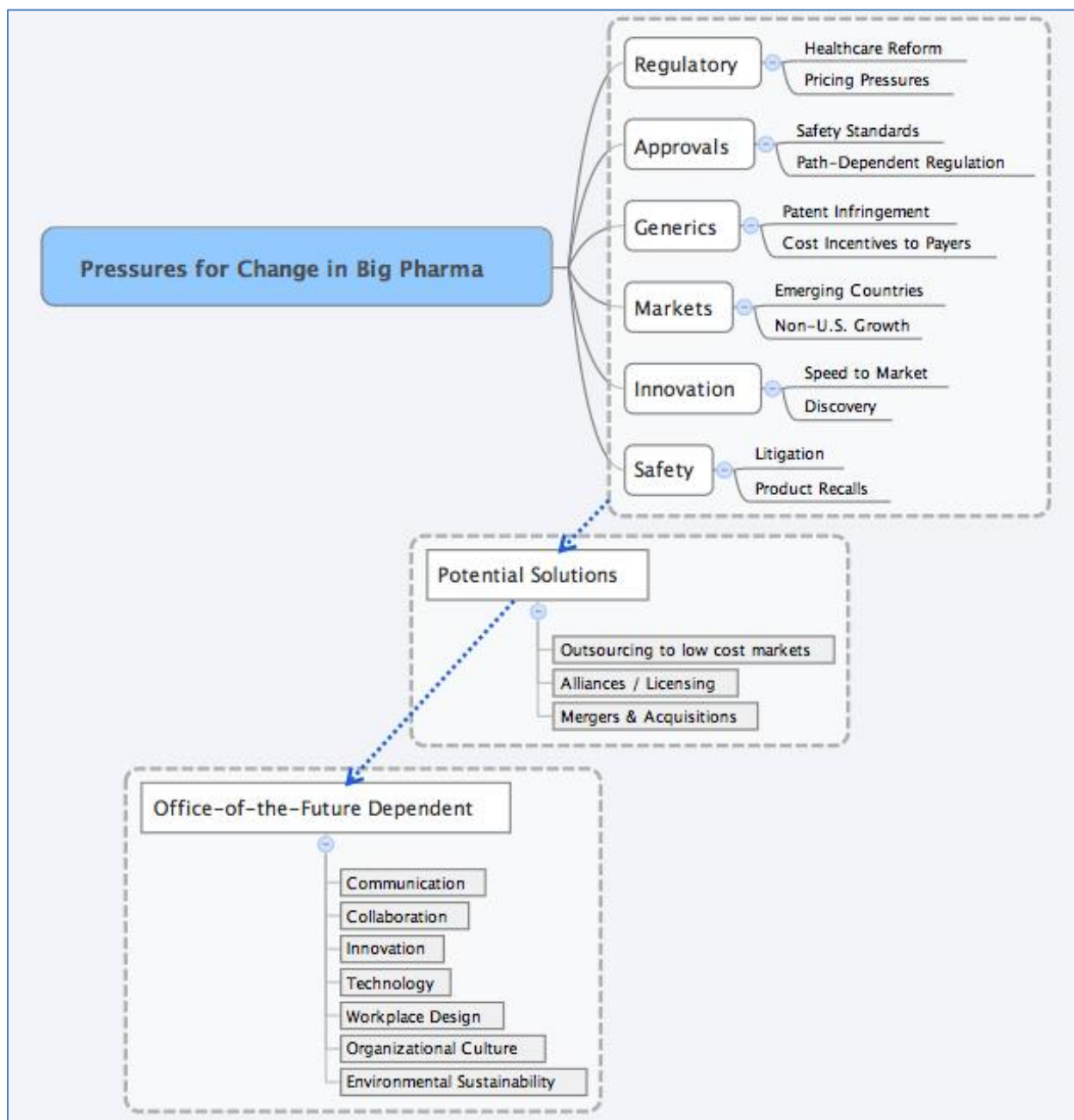
Many developing regions have differing drug development dynamics such as varying disease types, genetics, diet, climate or other factors that are unique to their geography. Biopharma companies are investing billions of dollars on clinical trials and pre-marketing before they attempt to introduce their existing product portfolio into new countries. Significant

investment will continue, especially as thorough assessments are required in order to understand business practice, culture and social practices, especially in populations that practice alternative forms of medicine.

### Summary

Many of the challenges facing Big Pharma companies are an increasing threat to long-term viability, and as such, companies now seek creative business model improvements to be successful. The conduits for business performance and financial improvement, across these and many other challenges in this environment, are effective collaboration and knowledge sharing. For example, if a company's core competency and focus is research and development, is the company indeed structured in a way that fosters a natural and optimal flow of information exchange? As suggested by Dr. Kay Wardle (2010) in a *Drug Discovery World* article entitled, "R&D Open Verdict," innovation within Big Pharma will be increasingly dependent upon collaboration, requiring agility from companies to adopt new approaches to collaborate and innovate, or concisely stated, "Evolve or die." As organizations assess how best to innovate, we are witnessing the birth of a new age in business. Figure 7 contains a concept map that pictorially summarizes the pressures for change in Big Pharma—a knowledge-based workforce, connected through globalization and empowered by technology, is dependent upon office-of-the-future concepts in order to best maximize collaboration and productivity.

Figure 7. Chapter 2 Summary: Pressures for Change in Big Pharma



## CHAPTER 3

### LITERATURE REVIEW

#### Office of the Future: Historical Timeline

One of the first mainstream introductions to office-of-the-future concepts can be viewed on *YouTube* (<http://www.youtube.com/watch?v=HnMjoiddRRM>). This popular television news archive was presented by the British Broadcasting Company (BBC) in 1969. The reporter, James Burke, made the following prediction:

No phone, no filing cabinet, no clutter, very efficient, no need to get out of this chair, no distractions, alone and efficient, BJ-39 will know, I don't even need to go to it, it comes to me. Wonder if anyone wants me, nobody to ask, much better than a human being, tireless and efficient, anything I want it brings, even company (recorded company). Free to get a lot of work done with no human interactions, funny how fast you get down to work when you're alone. I'm an automated executive. The great thing about machines is that they do what they're told, they never argue, never get sick, or smile at you, or say good morning, they just leave you alone (Burke, 1969).

Certainly aspects of this prediction resonate with the twenty-first century workplace; however, a fully-automated, isolated environment has not materialized.

When the United States entered the 1973-1975 recession that contributed to a decline in an industrial society and spurred the information economy, Alvin Toffler, in his 1970 book, *Future Shock*, predicted key elements of the information age. He believed that information would need to be “open”, revolutionizing the way we think, analyze, synthesize and express information which would lead to a forward leap in organizational creativity. This would then challenge the silos (“information monopolies”) that overspecialization created in the bureaucratic firm, resulting in a power shift from the “information guardians.” He described the need to truly revolutionize the way data were stored and retrieved as work flows continued to be non-linear,

better described as matrices or “networks that crisscross companies, crash through departmental perimeters, and link users” (p. 219). He concluded,

The fundamental relationship between knowledge and power in society is neglected which leads to the link between how a people organize their concepts and they organize their institutions; Put most briefly, the way we organize knowledge frequently determines the way we organize people” (p. 219).

While Toffler’s philosophies may have seemed radical for that era, practical examples began to appear in the late 1970’s, the most dominant example of which being Continental Bank. Mertes’s (1981) writing in *Harvard Business Review* presented a case study of how this bank created one of the first integrated networks of computers and assessed adjacencies in work flows. While the physical environment of the workplace was not addressed, this case study represents a disruptive, forward-looking practice driven by the needs of an emerging knowledge-dependent workforce. Geographic constraints, the need for more rapid information retrieval and the 1973-1975 recession spurred rapid improvements in information systems. Mertes predicted that in continued times of economic crisis, organizations would seek new ways to cope, including changes in work habits. Attention during that era focused on moving ideas and work messages (early forms of e-mail) from place to place rather than transporting people. He went on to predict that the time would come when an office worker would not need to leave home to do conventional office work and that remote working arrangements and organizational changes would evolve as technology costs decreased and operating costs increased.

Throughout the early 1980s, organizations continued to focus on the technology traits of the office-of-the-future. It became recognized that business needs and training were critical to ensure adoption of “smart new equipment” and that management must pay attention to human attitudes and needs (Plotzke, 1982). New technology themes focused on managerial

productivity, decision-making and problem-solving tasks matched to the needs of the user. Persistent in the early 1980s was a skewed emphasis on technology with limited recognition that the physical office would increasingly become spatially distributed. However, examples of telecommuting began to appear in the mid-1980s which highlighted a growing emphasis on giving more options to employees.

In the mid-to-late 1980s, the physical environment and the human element of the office place began to appear as synergistic topics in management journals. The fear that, “the high-tech world would eliminate the need for human beings,” was addressed by Maas (1983) by noting, “the business of business is ideas, and ideas are produced by people [the truth], not machines”. A primary conclusion was drawn by this author that the white-collar worker would persist no matter how technology advanced and that human values should be incorporated into the office setting. The term “adjacencies” (logical co-location of workers and functions that interact on common tasks, projects and deliverables) was introduced, and preliminary elements of activity-based office design were implemented. Examples of this include considerations of lighting, acoustics and the new term “ergonomics,” initially defined as the human factors of comfort (Maas, 1983).

A break-through article by Sutherland (1986) in *Management Review* began to challenge the “technomania.” He described how companies operated through the 1980s making huge investments in technology and modular furniture systems without ensuring that measureable, sustainable value could be achieved. It was at this time that thought leaders began to challenge the view of the physical office and analyze the nature of knowledge work. They concluded that offices at that time were rooted in the Western industrial society as key concepts from the

traditional mill spilled into how office workers were physically organized, and that while the nature of work in the information economy drastically changed, the physical office didn't. One might conclude that this lack of change could be attributed to the financial nature of capital reporting (capital assets are typically depreciated anywhere from 8-25 years). Nonetheless, influential voices stressed the need to seek major shifts in the balance of people, technology and facilities in consideration of the business productivity equation (Sutherland, 1986). Perhaps the office place of the 1980s was indeed an artifact with industrial age roots, but what would drive a change to more fit-for-purpose facilities and technology?

Two predictions in the 1980s, which came to fruition in the 1990s, were the dramatic decrease in the cost of technology and an observed trend in the heightening cost of real estate. For example, a 128MB memory chip in the 1970s cost a staggering \$1M, in the 1990s this same chip cost \$10, and in 2012 it costs \$5. With this cost reduction brought the miniaturization of office technology which better met the needs of mobile workers. This challenged companies to analyze the ways in which office space was utilized (Bleeker, 1991).

By the early 2000s, due to the Internet, e-mail and computer networks, many white collar office jobs could be performed outside the office as inside. Microsoft was one of the contributors and early adopters of providing flexible working options for their employees. Zion (2002) in an article, "Office of the Future Strives to Be Flexible, Interactive," cited a Microsoft employee who liked the freedom of telecommuting, and with the tragedy of the September 11, 2001 attacks on the World Trade Centers in New York City, indicated that businesses began to worry about the dangers of airplane travel. Options to collaborate and virtually connect with coworkers were addressed by improved technologies and offered cost-savings benefits, but for



those workers that remained in the physical office place, frustrations of daily work life persisted. Elements such as uncomfortable temperatures, hard-to-find colleagues, cramped meeting space, and the all-so-familiar drab, gray, high-walled cubicle office layout spurred several companies to address these issues. For example, in 2002, IBM and the dominant office furniture manufacturer, Steelcase, partnered on a research program call BlueSpace. Their joint vision was to leverage technology and space to solve the above-mentioned myriad of frustrations. Their research, influenced by academia, concluded that worker productivity would plummet if corporations continued to “corral workers into one-size-fits-all cubicles” (Deutsch, 2002). Further, a consensus was forming that furniture and devices would need to conform to user needs.

In 2005, in a paper, “The World is Getting Flatter,” Robert H. Buckman, former CEO and Chairman of the Board of Bulab Holding, Inc., acknowledges the shift in technological gains such as connectivity and speed, but points out barriers such as the QWERTY keyboard. He concluded,

The QWERTY keyboard has served us very well for many years now, but it is now a limiter in our ability to function as a knowledge worker. If I could enter knowledge into the system as fast as I could think rather than as fast as I can type, I could significantly improve my productivity as a knowledge worker (p.4).

His conclusions are reinforced by Liebowitz and Margolis (1995) as they described the adoption and continued use of the QWERTY keyboard as a path dependence for which it was the timing and not its efficiency which explains its survival. They concluded, “It makes sense to stop, take stock, and figure out where that path is leading us”. Most importantly Buckman stresses the human elements, rather than the non-human elements such as the actual hardware, of the productivity equation and observes three important increasing trends: (1) software will need to continue to accommodate how people operate within an organization, (2) virtual work will be the

norm for 70% of the developed nations' workforce by 2010 (thus creating largely redundant physical offices), and (3) the worker will be considered a consumer and the consumer a worker, meaning that the physical office place and the technology to support the knowledge worker will blur with predominant consumer preferences (Buckman, 2005).

It is this point in history that points to an evolving workplace and, that in order to succeed as a knowledge worker, skills and talents must also readily adapt. In 2005, according to Pole (2007), Microsoft noted that a good office worker of the future will be adept at handling information, and lots of it. The same holds true for the physical space. Companies must adopt workspaces that inspire, welcome and engage knowledge workers. Pole described the “inclusive workplace,” as a means to which companies and their managers should continue to explore opportunities to pay attention to how people felt about where they work. He highlighted the behavioral economic research conducted by Gallup (<http://www.gallup.com/consulting/52/employee-engagement.aspx>) and indicated that there is connectivity between employee engagement and the physical workplace environment.

Does the architecture and design of the physical workplace, especially when considering the physical and cognitive needs of the occupants, facilitate collaboration and working relationships between people? Horgen, Joroff, Porter and Schon (1999) in their book, *Excellence by Design: Transforming Workplace and Work Practice*, suggested a correlation between the workplace and collaboration. They described the approach to *process architecture* where the relationship of a workplace and its uses are managed throughout a workplace lifecycle. The authors challenged the traditional view (“physical container for work”) of the workplace and suggested that, “the workplace is a strategic element of the organization; workplace-making can

improve work practice and transform organizations”. They discuss workflow analysis (how work gets done), and used case study examples to highlight the connectivity between productivity and four dominate elements of the workplace—space, technology, people and economics.

### Workplace Effectiveness

According to the National Research Council in 1999 study entitled, “The Changing Nature of Work: Implications for Occupational Analysis”, work is likely to be more productive if the environment, “allows high discretion, flexibility, and the opportunity to work in teams to solve problems, analyze data, and negotiate over courses of action or the meaning of information” (p.5). Recognizing that there isn’t a one-size-fits-all model to improve productivity, a few common synergies across industries and organizations can be identified. First, globalization is creating connections enabled by technology, empowering work to happen everywhere. Second, the workforce is highly diverse across geography, race, religion and generation. Third, there is an increasing awareness of the importance of social responsibility primarily focused on environmental sustainability. The need to consider how we use environmental resources to sustain our planet is no longer an option. With these common factors, the definition of business success has changed to one where we ask, how does the workplace play a contributing role?

Gensler Design conducted a survey in 2008 to determine if the characteristics of a workplace environment could impact productivity, collaboration and competitiveness. Questionnaires were sent to 2000 individuals representing eight industries. Their research focused on the evolution of knowledge work, and how individuals and teams create

organizational value and drive performance. The results concluded that there are four work modes—focus, collaborate, learn and socialize—that allow the creative and innovative power of people to be fully realized. Gensler reported that five themes were identified: diversity, distance, work mode, responsibility and code.

Diversity factors include generational differences, gender, regional culture, lifestyle, language, work-style preferences, skills, learning mode and communication style. According to Buckman (2005), virtual collaboration technologies have played a significant role in shrinking distance, which improves organizational collaboration. Therefore organizations must be mindful of these factors when considering people, technology and workspace. Workplace design that incorporates these elements will provide employees with a sense of belonging, and according to Gallup's behavioral economic research ([www.gallup.com/consulting/52/employee-engagement.aspx](http://www.gallup.com/consulting/52/employee-engagement.aspx)) workers will then be more engaged.

Distance is another way of describing the globalization paradigm of the information age. Companies are now spread across the world and the need to interact to exchange ideas, information and best practices is important. For example, as outlined by Laing (2011) in a *Fortune Magazine* article, virtual collaboration technology (inclusive of three-dimensional immersive technology) reinforces these exchanges and allows organizations the fluidity and flexibility needed to compete by striking a balance between a virtual and physical workplace. Shevory (2011) in a *New York Times* article entitled, "Office Work Space is Shrinking, but That's Not All Bad," also emphasized virtual collaboration solutions and provides numerous examples of corporations saving millions of dollars through consolidations of underutilized space. Figure 8 presents images from HP's Halo platform (Telepresence) and ProtonMedia's

ProtoSphere platform (3D Immersive) to illustrate technological methods employed today to allow organizations more efficient and cost-effective collaboration.

Figure 8. Virtual Collaboration Technology Images



Work in 2012 is increasingly accomplished by individuals and teams across a multitude of technologies and locations, referred to as “work modes”. When considering the design of process, technology and space, successful organizations will need to ensure that they employ *process architecture* (see p.23) as they manage the variety of elements that may be considered to foster these modes. Flexible workstations, collaboration spaces, informal community space and efficient adjacencies are all ways that organizations can support the many choices that today’s workforce requires.

Responsibility can be incorporated into the workplace of the future as well. Many global organizations have adopted language with a positive moral theme in their presentations of identity. For example, the mission of Bristol-Myers Squibb (<http://www.bms.com/ourcompany/mission/pages/default.aspx>) is to “discover, develop and deliver innovative medicines that help patients prevail over serious diseases”; and their commitment to patients and customers,

employees, global communities, shareholders, environment and other stakeholders, is to “act on our belief that the priceless ingredient of every product is the integrity of its maker.”

This implies (but does not guarantee) that environmental sustainability, health, values and ethics will be integrated into the new office place. A company embracing this theme could respond when renovating buildings. Features such as day lighting, use of recycled building materials, fresh air, flexible scheduling and personal thermal comfort can be integrated into a LEED-registered building (<https://www.usgbc.org/ShowFile.aspx?DocumentID=3617>). The Gensler (2008) survey, for example, indicated that a healthy working environment stimulated engagement, improved staff retention and morale and reduces staff absenteeism.

“Code” refers to the unique identity or personality that each company possesses. There isn’t a one-size-fits-all approach to incorporating these elements into the office-of-the-future; design must address the uniqueness of the process, technology and most importantly, people and culture.

### Organizational Culture

In capturing the uniqueness of people, especially as related to elements of the diversity, organizations must recognize that culture is an observable, powerful force. Organizational culture can be defined as the shared values, beliefs, symbols and behaviors that strongly guide the ways decisions and actions are made at both the conscious and unconscious level (Haworth, 2012). Failure to address the importance of culture as the workplace evolves, is likely to have negative impact on a company’s well-being and success.

Hall (1966) applied the term “proxemics” to address the uniqueness of people and to

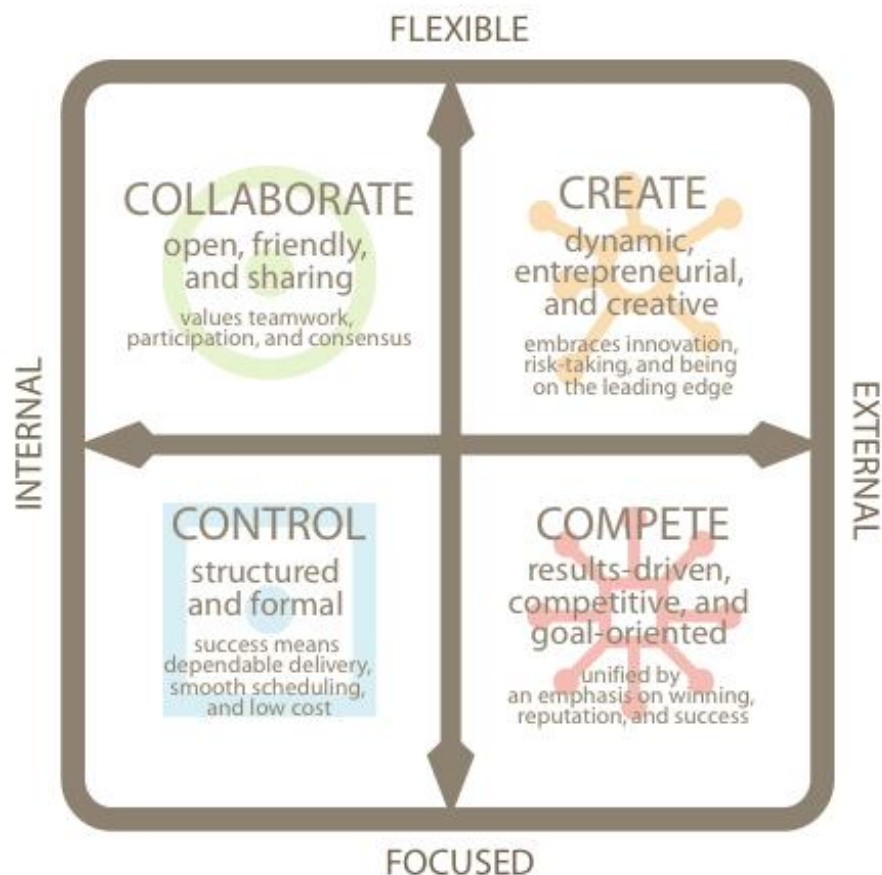
define the social and personal space and one's perception of it. More than 50 years ago, Hall examined how the senses are used by different human groups as they interact with their living and non-living environment. He observed that at the time of his research, planners, architects, and builders created spaces with little reference to human proxemic needs. He concluded that,

A person's sense of space is closely related to his sense of self, which is an intimate transaction with his environment. Humans can be viewed as having visual, kinesthetic, tactile, and thermal aspects of self, which may be either inhibited or encouraged to develop by their environment (p.63).

It seems likely that just as it did in 1966, in 2012 and beyond, each person's sense of space will continue to vary. I argue that the office-of-the-future should accommodate this variation as people will orient themselves in space if given flexible options. Laing (2011) described how companies have offered a variety of settings that have saved money, increased work flexibility and provided gains in worker productivity.

While personal or social space is an important element of organizational culture, Haworth (2012) has broadly divided culture into four types (see Figure 9): collaborative, creative, competitive and controlled. However, the author points out that a company's culture is not uniform and subcultures will exist within departments, teams and geographic locations. Integrating this into space planning may help meet the complexities of diversity.

Figure 9. Haworth's (2012) Four Types of Organizational Culture



### Collaboration and Unified Communications

Effective communication and collaboration are two important factors of organizational success (Hansen, 2009). Individuals and teams that work together by leveraging and applying intellectual capital and by relying upon leadership, human resources, training, process, culture and space, increase the effectiveness of collaboration (Hansen, 2009).

Technology is essential to ensure that individuals and teams can work across boundaries (time, distance and resources). As technology has evolved, it has become more integrated in order to best meet user needs surrounding efficiency and productivity. Companies including



AT&T, Cisco and IBM refer to unified communications (UC) as a set of hardware and software products that provide a consistent, unified user interface and user experience across multiple devices and media types. UC can provide integration of real-time communication services (e.g., instant messaging, telephony, video conferencing) with non-real time communication services (e.g., voicemail, email). As the U.S. workforce becomes more distributed, virtual collaboration has increased. UC should enable effective communication and collaboration over time and distance and should be selected to match the requirements of the task (e.g., some tasks require more rich communication such as visual vs. other tasks may be more easily handled textually).

While technology and leadership can foster effective collaboration, it is important to recognize that they can also become barriers. In his book, *Collaboration: How Leaders Avoid the Traps, Create Unity, and Reap Big Results*, Morten Hansen (2009) describes “the search barrier” in organizations and relates it to the phrase, “if only we knew what we know”. He discusses other collaboration roadblocks, but this specific barrier addresses the organizational need to design UC in a way that fosters knowledge transfer. Hall’s (1966) concept of proxemics is related to Allen’s (2001) findings that demonstrated that closer workspaces facilitated more communication and that when workspaces were more than twenty-five meters apart, there were almost no communication exchanges. So while organizations and collaborations don’t always have the ability to co-locate, UC should facilitate a convenient and stable modality of knowledge transfer.

With the proper technology in place, strategic talent management practices, support from leadership and an understanding of organizational culture, there is a greater likelihood of developing an effective workplace. However, I believe there is another element of importance.

## Environmental Sustainability

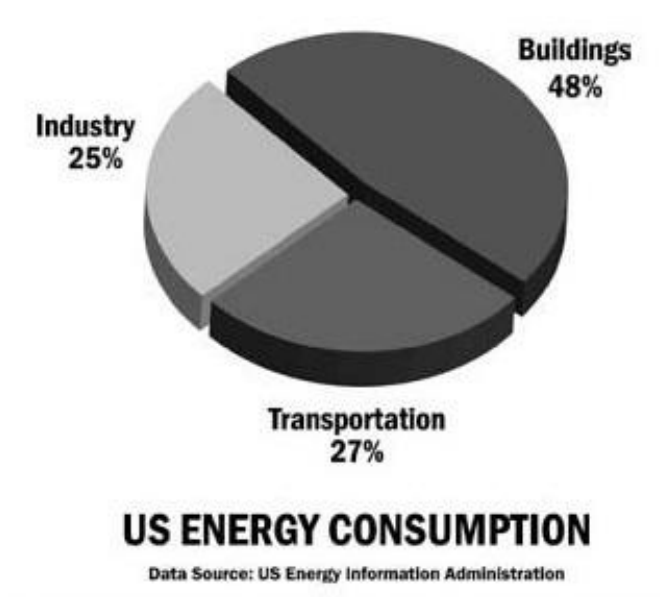
Wise businesses are now weaving environmental sustainability into their long-term strategies, and they're doing it by creating comprehensive sustainability plans. Effective plans identify key areas of eco-friendly opportunity and give businesses a roadmap of how to maximize identified opportunities. Needless to say, a sustainability plan requires more than just writing out goals on paper and then archiving the document. For example, the U.S. Environmental Protection Agency demonstrated that a strategic plan follows a process, involves the right stakeholders at the right time, is tailored to meet the uniqueness of the organization, ranks opportunities for effort and impact, describes implementation, defines timelines and using continuous improvement, emphasizes routine assessment with relevant metrics (<http://www.epa.gov/epahome/pdf/epasspp20102020.pdf>).

Global temperatures are rising; the average temperature of the continental U.S. in the 2000s is about 1.5 degrees Fahrenheit warmer than that of the 1970s (NOAA, 2011). The Polar ice cap is shrinking, with the area of permanent ice cover declining at the rate of nine percent per decade (Natural Resources Defense Council, 2011). The oceans are a grave source of concern due to the accumulation of human waste products: A recent article in the *Wall Street Journal* referred to a collection of plastic in the Pacific Ocean twice the size of Texas (Bush, 2011). Massive oil spills such as caused by the Exxon Valdez and the BP spill in the Gulf of Mexico are horrific examples of what can go wrong as a result of our transport and search for oil to power much of the global economy. Our internal river systems are not immune from oil spills, as evidenced by the recent leak of roughly one thousand barrels of oil into the Yellowstone River from a ruptured Exxon pipeline (Ball & Nicas, 2011). The National Oceanic and Atmospheric

Administration has noted that the U.S. will face more incidents of extreme weather which can be linked to climate change. For example, April 2011 was the most active tornado month in history according to the National Weather Service with a total of 875 tornadoes – up from the prior April record of 267 in 1974 – and well over the record for *any* month (542) set in May 2003 (NOAA, 2011). Many are arguing that our environment is showing signs of approaching a tipping point. Paul Hawken (2009), a prominent environmental speaker, recently commented, we are at a point in time “where every living system is declining, and the rate of decline is accelerating” (Hawken, 2009).

These changes suggest the need for companies to actively engage in a search for better ways to manage their environmental responsibilities and one method is to reduce their environmental footprint (e.g. reduction in the use of natural resources). One example is to focus on their buildings, as according to the U.S. Energy Information Administration (2009), 48% of all energy consumption in the U.S. is related to buildings (see Figure 10). According to the U.S. Environmental Protection Agency (2012), “green building is gaining momentum as the environmental impact of buildings becomes more apparent; this practice of building can maximize both economic and environmental performance.” While this green building is gaining momentum, is this practice perhaps too expensive a proposition for many companies with insignificant return on investment?

Figure 10. U.S. Energy Consumption for 2009



Black, Iammarino, Miller and Strombom (2009) take a different position. In *Commercial Real Estate Revolution: Nine Transforming Keys to Lowering Cost, Cutting Waste, and Driving Change in a Broken Industry* they agree that sustainability is today's buzzword, and that we all want to do our part to reduce energy consumption and waste. But they argue that to improve the problem, the culture of the organization must embrace sustainability as a core principle. As an organization integrates this principle (e.g., leadership integrating sustainability goals and principles into corporate strategy) and identifies the most significant areas of consumption and opportunity (commonly their buildings), their research shows that building or renovating to green standards (e.g. LEED) costs no more than building the conventional way. Further, they believe that adoption of green building practices will increase as corporate knowledge gaps are decreased (e.g., tangible ROI, improved public relations) and that "broader adoption will mean challenging the conventional wisdom, overturning some widely believed myths, and showing

how the foundation we've laid will achieve first cost effectiveness and ROI" (Black, Iammarino, Miller & Strombom, 2009). The authors report that, based on studying 1300 green buildings covering 351 million square feet in 2008 against non-green buildings of similar size, location, class, tenancy and year-built characteristics, some of the business benefits are as follows: discounted insurance rates, utility rebates, expedited permitting, reduced absenteeism, higher employee retention, higher rental rates, increased occupancy rates, public relations value, increased property value, tax rebates, reduced operating costs, reduced risk and greater adaptability for future business changes.

### Summary

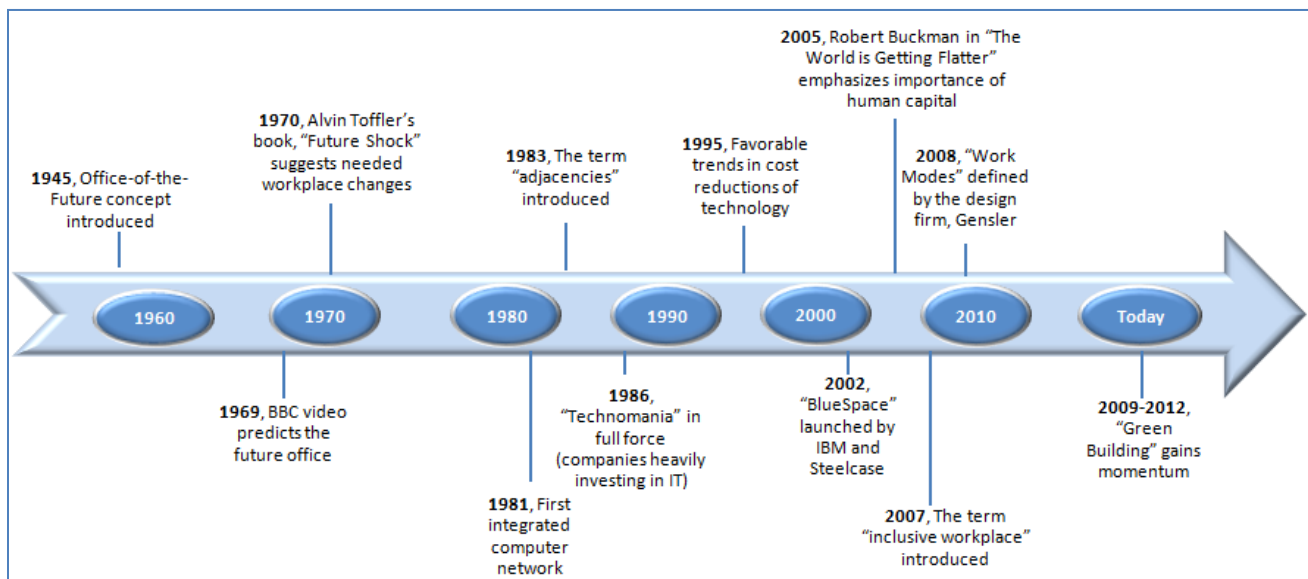
Building construction and maintenance is often the largest capital expense for a company, but the average operational costs in the U.S. are only one-eighth of the cost of its employees (Black, Iammarino, Miller & Strombom, 2009). I believe that people (the workforce) should be the primary focus of the office-of-the-future. In 2012, technology, process, leadership, sustainability and physical space all influence the degree to which people engage, innovate and collaborate. As organizations become virtual, the traditional office is increasingly becoming obsolete. For buildings that remain, the capital expenditure that must be minimized to ensure organizational viability continues to be disconnected from the people that it should empower. As noted by Black, Iammarino, Miller and Strombom (2009),

Today's office is a wasteland. It saps vitality, blocks talent, frustrates accomplishment. It is the daily scene of unfulfilled intentions and effort (p.255).

I propose that an office-of-the-future concept that has just launched at a leading biotechnology company can provide lessons for transitioning to the future. I report ethnographic research to highlight how they have incorporated lessons learned from the historical evolution of

the office-of-the-future summarized in this chapter (see Figure 11). I compare and contrast work flows, technology (Unified Communications), sustainability and the physical environment between the pilot building and an adjacent traditional building on the same campus.

Figure 11. Chapter Summary: Office-of-the-Future, Key Points in Time



## CHAPTER 4

### OFFICE OF THE FUTURE: A CASE STUDY ON WORKPLACE EFFECTIVENESS

#### Case Organization

I report a case involving a biopharmaceutical company to be called “BioPharm.” The organization was selected because they recently initiated an office-of-the-future pilot program and have renovated the first building in a five-building, four-year plan (2010-2014). From 2007 to 2009, cross-functional discussions occurred as BioPharm peers (e.g., Novartis, [http://www.novartis.ch/downloads/citizenship/biocamp/LOFT\\_Pressarticle\\_E\\_Final.pdf](http://www.novartis.ch/downloads/citizenship/biocamp/LOFT_Pressarticle_E_Final.pdf)) were adopting office-of-the-future concepts, but it wasn’t until 2010 when BioPharm’s leadership endorsed the business case to initiate an office-of-the-future pilot.

The characteristics of BioPharm are as follows: Founded in the 1980s, there are greater than 10,000 employees, and they have more than forty locations worldwide. BioPharm’s U.S. corporate campus has grown four times in size since the 1980s and in 2002 accommodated 70% of its employees. In 2012, due to global expansion (dispersion), this same corporate campus hosts only 35% of its employees.

#### Office-of-the-Future Concept

BioPharm created an office-of-the-future pilot program as a solution to further promote collaboration and innovation while optimizing the physical footprint of their U.S. corporate campus. They seek to create a physical and technological environment that can flexibly respond to the way employees work, and, where applicable, integrate corporate sustainability goals into designs and processes.

They define their program as the next generation of office place solutions intended for improvement across two dimensions, business performance and financial performance. Business performance is focused on improved collaboration, productivity and sustainability as a means to respond to the emerging workforce. Financial performance focused on lowered capital and operating costs and improved utilization of physical land and space.

Various elements of an effective workplace were considered by BioPharm to ensure that the design and solutions reflect the organization's culture, incorporate sustainability goals, lower total cost of ownership and, most importantly, accommodate the needs of the workforce, particularly as a means to retain and attract new staff. Examination of this program highlights tangible benefits that this company seeks and concludes that, through integration of the office-of-the-future elements described thus far, the concept is sustainable, repeatable, and prepares an organization for more predicted, radical changes in the future.

### Methodology

In order to effectively examine this particular office-of-the-future pilot program, I applied the participant-observation research methodology known as ethnography. Ethnography is a form of participant-observation that allows a researcher to explore and examine the cultures and societies that are a fundamental part of the human experience. Participant-observation can be defined as a

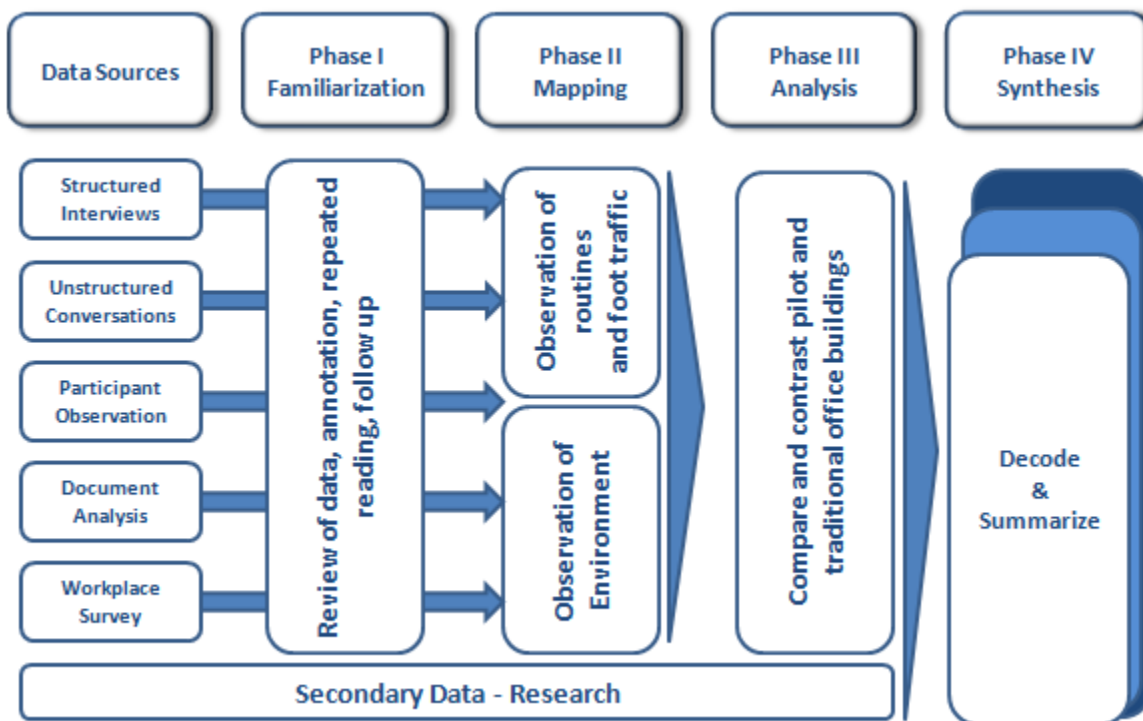
process in which the (researcher) closely observes, records, and engages in the daily life of another culture. The work involves a continued attempt to 'see' the researched community from the 'inside' and from the 'outside,' to grasp the nuance and detail and subtle meanings from within, but then to situate them in a wider social context (Davidman, 1991, p.53)



An ethnographer collects data and gains insight through firsthand involvement with research subjects and informants. This interaction takes many forms, from conversations and interviews, to participant observation (Murchison, 2010). This research strategy allowed me to observe, examine and analyze the fundamental aspects of BioPharm’s office-of-the-future.

Data collection was collected and analyzed in four phases and involved document archive review, participant observation, workflow mapping, a workplace satisfaction survey, structured interviews and unstructured conversations (see Figure 12). My study was deliberately limited to two buildings on campus—a newly renovated office-of-the-future building and a traditional office building last renovated in the 1980s.

Figure 12. Overview of Case Methodology



The research questions were:

1. In what ways does this specific office-of-the-future pilot program facilitate the business and financial goals of the company? and
2. In what ways does this pilot benefit employees and overall worker productivity?

Maps and diagrams presented in this chapter translate the spatial dimensions of this program, while data from key informants (directors, managers, associates, designers and engineers) describe the experiential dimensions. Through iterations of coding and data analysis, the following key analytical categories rose to the surface: space, light, material, workflow (movement), time, employee satisfaction and cost. These categories allowed me to draw connections between participants (employees) and the concepts of office-of-the-future. The research concludes with recommendations offered to future researchers and other organizations that seek similar benefits.

#### Pilot Program Objectives

In 2007, the corporate engineering department at BioPharm initiated discussions with senior leadership surrounding the need to 1) understand the changing demographic profile of employees, 2) align with human resources on flexible working arrangements, 3) formalize staff accommodation policies and 4) strategically align space planning with company globalization goals. Clear guidance was provided and centered on the need to conduct a workplace survey in order to understand the current state. In review of the minutes from meetings with select executives from 2007 (e.g. HR, engineering, finance), it is evident that the primary goal of the assessment phase was to identify how the company could provide highly-functional workspace for employees which aligned with their business strategies to remain competitive and innovative.

The assessment team received executive sponsorship to conduct a global workplace study in order to determine how best to align the company culture, individual and teaming workplace strategies, technology and the physical workspace. It was during this initial phase that the company recognized the need to build a cross-functional team across engineering, finance, environmental health and safety, information technology and human resources. It was also recognized that technology and work styles had evolved, yet the physical space had remained broadly unchanged over the previous twenty years (see Figure 13). Advances in interior building design would be a key focus for this team in order to promote a sustainable, flexible model that would allow the company to more readily adapt in the future (e.g. raised floors, modular walls and wireless technologies allow for a variety of workspace configurations).

Figure 13. The Traditional Office at BioPharm



### Workplace Survey

Conducted in 2009 and facilitated by an external agency, the survey allowed BioPharm to build a business case and ultimately gain executive support to proceed with phase two of the pilot (design and construction). The workplace survey collected feedback across thirty-five core

topics from over 1200 employees. Additionally, an observation team was formed and collected over 15,000 data points (e.g. workflow, employee interaction) of the current physical work environment.

The survey and subsequent analysis allowed the company to understand employee work patterns, the effectiveness of physical space (through feedback and observation), and their impact on key business drivers such as employee satisfaction and organizational commitment. The assessment of work patterns was categorized into four areas: concentration, collaboration, education and socialization. Logically, the physical environment preferences for each work mode are different and this will be further described in the design and construction phase.

Of the thirty-five core survey topics, respondents were asked to evaluate the quality of attributes such as light, air, furniture, storage, ergonomics, privacy and distraction (noise and motion). The resulting scores, for which the average was 67%, allowed the company to interpret what was working well in the current space and should be maintained, as well as what needed improvement in the office-of-the-future strategy. It is of note that the external survey facilitator shared industry-average benchmark data as one means of allowing the company to gauge their scores among top-performing companies in their industry; BioPharm's scores were average. However, it should also be noted that as culture varies by company and even department, as discussed in Chapter 3, the concept of benchmarking may not offer a sound means of comparison nor lead to uniform solutions across industries and companies.

Several key data collection activities occurred in parallel to the employee survey such as visioning with senior leaders, space and activity analysis and focus groups (work modes, culture and "a day in the life"). These activities explored issues surrounding drivers for change, the

company’s culture (referred to as “DNA” by BioPharm), goals, challenges and projected success factors. As outlined in Table 2, the visioning session with senior leaders highlighted several critical current state attributes that would require additional consideration during subsequent phases of the workplace strategy.

Table 2. Visioning from BioPharm Senior Leaders

Attribute	Senior Leadership Observations & Guidance
Globalization	Flexible and mobile working is increasing; teams are becoming more distributed
Culture	The company is collaborative, competitive and process-driven
Meetings	Collaboration is central to a consensus-driven environment, yet meetings are often inefficient and time consuming
Values	Workplace strategy needs to express values of wellness and sustainability
Space	Strongly linked to hierarchy and legacy (e.g. office assignment-entitlement, furniture type)
Productivity	Issues of noise, distraction and privacy need to be addressed

The space and activity analysis observed selected spaces where the survey respondents resided. The buildings reflected the traditional office, cubicle and conference room standard. Researchers recorded the flow of workers and activity that resulted in the previously mentioned 15,000 data points. When aggregated and analyzed, a snapshot of work patterns was revealed (see Figure 14). Note that in Figure 14, the highlighted and numbered cells represent specific activities that are considered to be *adjacent*, meaning that there are synergies and collaborations that occur between those particular workers. For anonymity, a legend of those functions is not provided, but it will be important for BioPharm to assess work activities and time-and-motion factors as it positions to reorganize the physical flow and layout.

Figure 14. Space &amp; Activity Analysis



During the activity analysis, a key finding was that only 44% of the observed offices were utilized in the course of a normal working day. Less than half of the observed workers worked predominantly at their desks, which exhibited a roaming work style (in the office but mostly away from their desks). Collaboration occurred in smaller groups and often in small offices rather than meeting rooms. Lastly, break areas were used for individual focus work and collaboration activities as often as they were used for social purposes, e.g. lunch breaks.

Focus groups were held and centered on work modes (concentration, collaboration, education and socialization). These discussions revealed the “why” behind much of the workplace survey data. Table 3 provides an overview of participant comments that form the basis of the importance of collecting “voice of the worker” data prior to initiating change. The key findings from the focus groups were that the intended values and brand are clearly understood by BioPharm employees, but the workspace does not express the attributes of the values.

Table 3. Focus Group Comments

Attribute	Quote
Distraction	“Impromptu meetings happening in the open are the most distracting.”
	“We need a ‘no talking zone’ – a place to go and do web training with no distractions.”
	“Distractions are caused by work nearby that has to be done collaboratively, interrupting people who are trying to focus.”
Light	“Light, bright and color would be great.”
Meetings	“Meetings are often about building a relationship with you and taking you on a journey so when the time comes I can make a decision with you.”
	“I can’t stand that people are calling into virtual meetings even when they sit in the same area-they are missing the opportunity to build a team relationship.”
Virtual	“The manager of the future can bond well with ‘the voice’ and learn to manage teams virtually.”
Entitlement	“The status of having an office vs. a cube is a really big deal.”

The information obtained from data gathering activities in phase one allowed the team to reconvene with senior leadership in 2008. The team highlighted the following opportunities which formed a concrete business case to proceed with the design and construction in phase two: underutilized space, lack of consideration of work modes, misuse of resources (utilities, building overhead), misaligned ratio of fit-for-purpose collaboration spaces (need for smaller meeting spaces), outdated look and feel, inefficient furniture layout and poor environmental aspects (lack of natural light, drab color, poor air quality).

#### Phase Two: Design and Construction

Over the past several years, BioPharm developed the plans, obtained the necessary internal and external approvals, and remodeled a single building on its campus leveraging the results of the workplace survey, new building technologies (e.g. LEED design), and new

workplace technologies (e.g. unified communications). The physical space integrates the task of the worker with layout, light, air, storage, furniture and privacy preferences (see Figure 15).

Figure 15. Pilot Layout and Views



The new environment seeks to foster a community-based atmosphere while considering work modes, individuality, agility and collaboration. Overall, nine key factors were incorporated into the design and launch of their pilot. A description of each factor will be presented, but first it is important to note that the pilot building is physically divided into four zones to accommodate for the variety of work modes (see Figure 16).



Figure 16. Work Mode Zones



Zone 1 is the hub of activity in the building and is also the place to find scheduled conference rooms as well as focus rooms and meeting spaces that one can use at a moment's notice. In this zone, there is a small café and one may connect with colleagues within a variety of flexible spaces.

Zone 2 surrounds an activity center. This zone contains conference rooms and collaboration spaces that require prior reservation. This makes the conference spaces easy to find and also serves as a noise barrier from the collaboration activities in Zone 1. Beyond Zone 2 one enters the neighborhood areas of the building.

Zone 3 contains a variety of collaborative spaces that are available to anyone without prior reservation. This enables employees to use a collaboration space at a moment's notice. Spaces have been provided to support ad hoc or impromptu meetings with team members, and

ensure that there are places to go to collaborate effectively. Private focus rooms for individual concentration are also available in this zone.

Zone 4 is made up of dedicated workspaces that include open workstations, offices, and a variety of team collaboration and focus spaces. Resident and flexible workers have their own assigned workspaces in this area. The majority of individual workspaces have access to natural daylight and views to the outside.

As mentioned, nine factors stemming from the workplace survey were integrated into this pilot building. (1) Workstations and offices were designed to support a variety of work modes and work styles. Physical relationships between offices, panel heights and acoustics were addressed. (2) Unassigned workspaces allow for roaming and remote workers to “drop in”. (3) Quiet zones, absent of phones, allow for workers space for learning and training with minimal distraction. (4) Meeting spaces are right-sized and leverage scheduling technology for optimal utilization. (5) Ad-hoc collaboration spaces exist and are available on a first-come, first-serve basis. The majority of these spaces offer flat panel monitors for effective collaboration with remote colleagues. (6) Gathering spaces, such as kitchenettes, are enhanced. These newly designed spaces encourage informal conversation, interaction and relationship-building. (7) Corridors and main traffic routes are the foot traffic arteries and present opportunities for workers to engage. These passageways are clearly marked in order to minimize the challenge of navigating through an unfamiliar building. (8) The overall space is humanized and more closely reflects BioPharm’s values. In a believable manner, the new layout and available amenities/choices communicate that the employee is the most valuable company asset. (9) Finally, the pilot design optimizes operational performance, increases occupant satisfaction and

communicates a commitment to staff well-being and environmental sustainability.

### Post-Occupancy Survey

As a final ethnographic activity (and one that the BioPharm has yet to conduct on a grander, more formalized scale), I surveyed twenty employees from the new pilot building as well as twenty employees from another, more traditional building on campus (Figure 13). The sampling strategy, while not scientific, provides a reasonable representation of employees performing similar work activities between the two buildings. The survey contained 31 core elements across four workspaces (office/workstation, meeting areas, common areas and support areas). These 31 elements (questions) were framed with the questions, “How effective is your workspace/workplace?” Each question was based upon a scale of 1 (not satisfied) to 10 (satisfied). Aggregate responses from participants in the traditional office were then summarized in the form of an average, as were responses from the new pilot building. The purpose of the survey was to gauge employee satisfaction, particularly in the new pilot building as the employees have only occupied the new space for three months. Per the workplace strategy and the integration of the key elements of workplace effectiveness, has this pilot achieved its potential and goals? Table 4 summarizes the survey results, and there are several key outcomes that require discussion. Note that the cells highlighted in green simply indicate which workplace was preferred.

Table 4. Post-Occupancy Survey

<b>Workplace Performance - Comparative Survey</b>		
<b>OFFICE WORKSTATION</b>	<b>Traditional</b>	<b>Pilot</b>
Amount of work surface	7.2	9.0
Plug Access	6.4	9.5
Storage	6.8	8.2
Ergonomics	3.4	8.2
Amount/Quality of light	4.0	9.7
Visual contact (w/ coworkers)	5.2	9.5
Design (look/feel)	4.2	9.8
Distractions (noise)	4.6	7.7
Distractions (traffic)	4.8	8.8
Privacy	6.4	6.7
<b>MEETING AREAS</b>		
Availability	5.4	8.7
Proximity	6.4	9.3
Appropriateness for type of meeting (size/layout)	7.6	8.8
Port/plug access	7.4	9.2
Availability/functionality of technology hardware	7.0	7.0
Availability of collaborative work surfaces	4.2	9.0
Ergonomics	5.4	9.2
Amount/quality of light	5.8	9.5
Design (look/feel)	5.6	9.5
Distractions (noise)	7.0	6.7
Distractions (traffic)	7.4	6.0
Privacy	7.2	6.5
<b>COMMON AREAS</b>		
Visitor entry	5.2	9.2
Employee entry	5.4	9.5
Common areas	5.0	9.2
Corridors, stairways, hallways	4.8	8.7
<b>SUPPORT AREAS</b>		
Functionality of training rooms	5.4	8.5
Availability of common areas	4.4	9.0
Proximity of copy/print areas	5.0	9.0
Access to central filing	3.6	9.3
Circulation promoting sense of community	4.0	9.0
<b>Total</b>	<b>5.6</b>	<b>8.6</b>

First, it is evident that the new pilot building, overall, presents a space in which employee satisfaction is statistically significant than the traditional space. The design (look/feel) was the highest rated category with layout convenience, such as logical plug placement, coming in second (the traditional office layout contains plug locations under the desk at the floor level).

Second, the results of the category, ‘availability/functionality of technology hardware’, deserve attention. During interviews with employees, some stated that the traditional Microsoft-based PCs running outdated and slow platforms were simply transferred from the traditional office to the new office. Others stated that they often experience performance issues with the voice-over-internet phone system. In addition, as traditional projectors and screens were replaced in the new design by flat screen televisions, a few interviewees stated that it is often challenging to see shared documents, especially spreadsheets. On the topic of technology, and as discussed in Chapter 3, organizations will excel when able to effectively adopt relevant top-performing consumer products. For example (and related to the PC dissatisfactions), one could argue that the performance, speed and innovation offered by up-to-date computer hardware with high definition video cards and monitors could remediate these constraints. Top-performing and high-powered computers are especially important to support the use of three-dimensional immersive technology and other collaboration software and hardware solutions. While accommodating IT security and privacy requirements, organizations that offer choices in work styles, must also embrace offering choices in technology hardware.

Third, the survey results highlight a critical dissatisfaction in the pilot building related to distraction, both noise and traffic (motion). Perhaps this dissatisfaction is simply related to a change in workplace behavior? Recall the photo in Figure 13, in which cubicle walls are high and dense thereby hampering noise from carrying across the office. In the new layout, employees must be cognizant of the four work zones and tailor communications accordingly. Curious about this particular survey result, I spent some time observing activity in each zone and identified three potential improvements: (1) office-of-the-future etiquette must be continually

emphasized, as both occupants and building visitors do not always employ respectful work habits (e.g. approaching cubicles in an ad-hoc manner, conducting person-to-person conversations in quiet/focus zones and conducting high-volume phone conversations in quiet/focus zones. (2) People traffic and motion as a form of distraction should be assessed in future pilot buildings at this company. The transition from offices or cubicles with high walls and solid doors to low-walled cubicles and fully-transparent glass office doors is, per my observations, not a simple adjustment. (3) Finally, workplace privacy, especially in a regulated environment, is a critical factor in the current workplace. Company compliance training stipulates that certain information – such as drug formulations and clinical trial results – is on a need-to-know basis, yet virtually every workspace, office, collaboration room and conference room in the pilot building has transparent boundaries (e.g. only partially frosted doors in conference rooms, and fully transparent glass doors in all offices). Privacy from conversations and sound transfer is also a concern, even with the white noise (noise cancelling) speaker system that is installed throughout the building. During one session in a closed collaboration room, I was able to clearly hear a group in an adjacent room. The topic of my project involved outsourcing company personnel, and it was when I heard the group in the neighboring room, that I realized my sensitive conversation was at-risk for being overheard.

In the spirit of continuous improvement (and hence why BioPharm has stated that this is a pilot) the above and other future-identified opportunity areas are not insurmountable. The continued success of the pilot will depend upon BioPharm's ability to incorporate employee feedback and measure employee productivity in a timely and robust manner.

### Measuring Workplace Productivity

Productivity consists of measuring the outputs of an organization against the consumed inputs. BioPharm can measure the quantity, value and quality of products and services (outputs) against the input costs incurred (e.g. time, labor, materials, capital, tools, travel, technology) during the course of producing such outputs. In today's recession-based environment, BioPharm will benefit most when the units of measure for both input and output are quantified in financial terms (e.g., labor rates, cost of goods sold, depreciation, etc.). An effective approach in measuring productivity gain for most work tasks, predominantly leveraged today by finance and sourcing organizations, is simply to use the following formulas (Card, 2006):

Figure 17. Productivity Formulas

$$productivity = \frac{output\_produced}{resources\_consumed}$$

$$productivity\ gain = baseline + measured\ change$$

While the formulas are seemingly straightforward, identifying the units of measure and sources that contain the data to form the baseline can sometimes be very challenging. Additionally, many organizations, including BioPharm, sometimes struggle to identify the best measurement approach. How does one capture the value derived when executing upon workplace effectiveness strategies?

### Towards Modeling Total Value Creation

Having limited knowledge of existing models and value-based theories along with a need to measure and report value generation, a sourcing team at one biopharmaceutical company

sought out to develop a total value creation model for use in the lifecycle of strategic sourcing projects. The project closely followed a structured approach to project management (e.g. Project Management Institute PMI®). The project team created a charter, project plan, gathered requirements, created a test model and simulated a retrospective project portfolio review to determine if the model framework was fit for purpose. Three key lessons emerged from this exercise that relate directly to the measurement of value derived from implementing workplace strategies as described by the BioPharm pilot program. First, an effective productivity or value measurement framework establishes an accurate and organizationally-accepted baseline for which performance improvement can be measured. Measured change (favorable or unfavorable) facilitates better decision-making about investments in capital (space), process changes, technology and outsourcing. Second, there is not a one-size-fits-all total value creation model. For example, when attempting to measure employee productivity derived from the pilot described herein, the company will need to consider variances in labor type, task, quality and even risk (e.g., barriers to change, tolerance related to lack of privacy, etc.). Lastly, the value analysis and measurement tool should be created during the planning phases of an intended project. Input from a variety of stakeholders will facilitate a more thorough understanding of the cost of inputs for a given focus area.

The framework that was created by this sourcing team provides a robust approach to the identification of value levers, baseline creation and the overall capture of productivity gains. BioPharm would benefit from the application of this framework, as there will be a continued impetus to reduce overhead and operating expenses and report out results accordingly.

### Summary



While many companies have adopted workplace concepts similar to those presented in this case, it should be recognized that BioPharm's strategy considered its culture and values. Through various interviews with lead designers and engineers, it is apparent that BioPharm recognizes that this pilot building is the 'office of now', but aspires through a flexible model and deliberate strategy to determine what will be its 'office-of-the-future'.

BioPharm is realizing roughly a 30% reduction in employee-per-square-foot costs and a 47% increase in density (number of employees per square foot). They are also realizing measureable bottom-line cost savings through capital avoidance, sale of real estate and annual operating costs. However, they believe, as my research confirms, that the most meaningful benefit is improved worker productivity leading to optimal business performance. However, as discovered in interviews, BioPharm does not have a centralized benefits measurement tool. Current metrics are limited to environmental sustainability and operating costs (e.g. utilities, carbon footprint), and, admittedly, they have yet to identify adequate methods by which to measure employee productivity. The questions still remain- does this pilot introduce/explore additional innovations (e.g. sound proofing, noise level warning systems) to respond to the pilot feedback and to what extent does this pilot building enhance productivity, and how might companies measure benefits when adopting new workplace models? The next chapter offers possible additional considerations that could further enhance current productivity and concludes with suggestions for organizations considering a movement toward office-of-the-future design.

## CHAPTER 5

### PROJECTING THE FUTURE

Beyond the cost pressures that currently plague the biopharmaceutical industry, there are other macroeconomic pressures that implicate how work gets done in the future. The Great Recession has caused organizations around the world to assess how overhead expenses, travel, and real estate are leveraged to conduct business. In an alternative workplace benchmark study, conducted by Langhoff, Nagy, Ouye and Singer (2010), 40% of respondents stated that their workplace strategies have expanded flexible working arrangements (e.g., home-based or unassigned drop-in spaces) and 60% reported a continued decline in business travel and an increase in remote collaboration. In a Gartner (2010) research report, *3D Environments Add Context to Collaboration*, Carol Rozwell summarizes how major organizations such as the U.S. Air Force and Michelin have adopted 3D virtual collaboration technology and have reported increased levels of collaboration, richer interaction, and enhanced readiness for tasks requiring complex, contextually-aware skills and observation. In a related and more recent BBC article (2012), *Viewpoint: Gartner on the Changing Nature of Work*, Tom Austin describes ten “mega-trends” in which the world of work will change, inclusive of the increased use of simulated environments to enhance active engagement. While these concepts represent positive change and lead one to believe that there is recognition of the drastic evolution in the way work gets accomplished, it still leaves many organizations ill-prepared for the future.

Imagine if the cost of gasoline reached \$20 per gallon, as predicted by Rubin (2009) in the book, *Why Your World is About to Get a Whole Lot Smaller: Oil and the End of Civilization* (Rubin, 2009), or if the United Nations predictions come true and three billion people experience

“water stress” by 2025 (un.org, 2012). Concisely stated, the ways in which we would work, where we would work and the tools we would use would require dramatic change. We can observe early, yet partial, indicators that workplace adaptations are essential, as described in the BioPharm office-of-the-future pilot program, and organizations should not delay in continually refining their workplace strategies.

Of all possible predictions associated to energy and water crises, organizations should proactively assume, based on the current indications that virtual dispersion of work will continue as companies seek alternative models, often in developing countries, to lower their operating costs. Much will continue to change about the way we work, and it should be assumed that organizations must embrace social and environmental responsibility, do more with less and, embrace new ways of working supported by leading collaborative technologies.

As many workplaces today reflect the traditional paradigm that created a space at a single point in time with persistence of perpetual practices, they are not aligned with today’s current business environment. Black, Iammarino, Miller and Strombom (2009) argue that dispersed and interdependent relationships, immediacy, complexity, acceleration and unpredictability are common business themes for which many in today’s workforce are sub-optimally-equipped to face a marketplace that favors agility and productivity (p.264).

While the output of my research doesn’t promote a single ‘silver bullet’ workplace strategy or model, practical implications, trends and ideas, fueled by the Great Recession, influenced by global competition, and shaped by innovative technology, lead me to claim that the seismic shift in the U.S. workplace will continue. It is my belief that a greater number of Big Pharma organizations should adopt office-of-the-future concepts as one means of addressing the

*burning platform* (in my own words, an emphasis on immediate and radical change to address dire circumstances within the biopharmaceutical industry). The BioPharm case demonstrated how one company practically applied office-of-the-future concepts to realize dramatic benefits. Their pilot was successful in many ways as they forecast future workplace changes by leveraging a repeatable, sustainable approach aligned to their business and financial goals.

While much change looms on the horizon, based on research and my ethnographic study, the following recommendations are suggested and may be more applicable to organizations similar to BioPharm:

- Deliberate your workplace strategy. Where do you want to take your organization? What is the current financial baseline, and what actions are needed to realize a favorable productivity gain?
- A workplace strategy considers very practical elements of workspace:
  - Space utilization considers opportunities for consolidation (BioPharm documented that only 44% of the observed offices were occupied in a normal work day)
  - The layout is flexible and offers choices depending upon a given work mode
  - Collaboration and lounge spaces promote impromptu meetings, networking and information exchange
  - Private, distraction-free areas ensure preservation of individual productivity (BioPharm has an opportunity in the pilot building of reinforcing rules in the quiet zones and enhancing sound proofing in future iterations of building improvements)
  - Workplace processes are analyzed to ensure efficiencies in adjacencies
  - Environmental sustainability benefits are measured and employees are provided with education and routine metric reports
  - Communication and change management strategies extend through the entire lifecycle
  - The entire workplace lifecycle is iterative – develop a mechanism which allows your organization the agility to continuously research, benchmark and improve
- One size does not fit all. Be sure to consider voice of the worker, organizational culture and fit-for-purpose technology into your workplace strategy. This is not a

user-designed workplace, but rather a cross-functional leadership team that considers occupants' needs and feedback during the design process.

- Flexible work arrangements for knowledge workers are increasingly appealing and offer mutual benefits to the organization and worker. Among many dynamics, assessment of worker role types should be a key consideration when developing flexible work programs.
- Cross-functional alignment and oversight of the workplace strategy allowed key BioPharm stakeholders a 'voice' in the design. Representatives from corporate real estate, facilities, engineering, human resources, information systems, finance and sourcing should be considered when forming core workplace design team.
- Executive sponsorship is a must. A cross-functional team can collaborate to build a compelling, credible and actionable business case, but leadership must ultimately determine if the organizational timing to implement a new workplace is right. At BioPharm, the timing was right and the business case was compelling—the business case focused on employee productivity and tangible cost savings for which senior leadership support was essential in obtaining budget approval, change management support and alignment to organizational goals and values.
- Measure success. An effective and flexible strategy incorporates a continuous improvement mechanism which is fed by research, benchmarking and employee feedback. Your metrics should be specific, timely and actionable.

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## GLOSSARY

**3D Immersive Technology** – technology that has the potential to blur the line between the physical world and the digital or simulated world, thereby creating a sense of deep engagement or involvement

**Big Pharma** – also referred to as “biopharma” in this paper; The top 10 global biopharmaceutical companies based on 2011 sales. Big Pharma is also used to describe companies with revenues in excess of \$3 billion per year

**Collaboration** – working together to achieve a goal. It is a recursive process where two or more people or organizations work together to realize shared goals

**Environmental Sustainability** – maintaining the factors and practices that contribute to the quality of environment on a long-term basis

**Ethnography** – a research strategy that allows researchers to explore and examine the cultures and societies that are a fundamental part of the human experience

**Lean Construction** – the holistic pursuit of concurrent and continuous improvements in all dimensions of the built and natural environment: design, construction, activation, maintenance, salvaging, and recycling

**LEED Construction** – Leadership in Energy and Environmental Design; A suite of rating systems for the design, construction and operation of high performance green buildings, homes and neighborhoods

**Organizational Culture** - a pattern of shared basic assumptions invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration

**Unified Communications** – a set of products that provides a consistent unified user interface and user experience across multiple devices and media types; Integration of real-time communication services (e.g. instant messaging, telephony, video conferencing) with non-real communication services (e.g. voicemail, email)

**Telepresence** – a set of technologies which allow a person to feel as if they were present, to give the appearance of being present

**Workplace Effectiveness** – the effectiveness of spaces where work happens which in theory makes a difference in successful employee performance and satisfaction in knowledge economy workplaces; Workplace Effectiveness is measured by the Workplace Performance Index (Gensler, 2008)

## APPENDIX

### About the Author

Matthew Paul Walls was born in Syracuse, New York and at an early age, moved to Wyomissing, Pennsylvania. Raised by his parents, Bob and Bonnie Walls, he was afforded a family life (with older brother, James, and younger sister, Kristi) that emphasized education and a “do the right thing” value-system. Matthew attended private schools, K-12, and then went on to the University of Pennsylvania to receive a Bachelor’s in Business Administration from The Wharton School. In 2012, Matthew will graduate with a Master of Science in Organizational Dynamics (MSOD) from the University of Pennsylvania. He sought this advanced degree to optimally complement his undergraduate studies and has immensely benefited from the MSOD Program’s blend of innovative thinking with practical and strategic tools. His career has continually leveraged the benefits and experiences afforded from both his family and education.

Matthew’s professional experience has been concentrated in supply chain and strategic sourcing with acute focus in process improvement, managerial accounting and business process outsourcing (BPO). In the course of supporting strategic sourcing organizations at leading biopharmaceutical companies, Matthew has traveled to over thirty-five countries. In recent travels, emphasis has focused on best practices in environmental sustainability, virtual collaboration and economic development. Other travel has allowed Matthew to interact with and learn from peer Big Pharma companies with a specific focus on research and development (R&D) sourcing trends and best practices.

In conjunction with career activities, Matthew is a co-founder of the University of Pennsylvania’s *Virtual Organizational Dynamics Design Lab* (vOD), a research and consulting

lab that explores 3D and other collaboration technologies aimed at offering solutions to organizations that seek to improve knowledge sharing, collaboration and productivity.

The research and thoughts expressed in this paper are synergistic with the nature of Matthew's professional focus, experiences and skill set. Change management, cost savings, total cost analyses and organizational culture are just a few of the elements that are directly aligned with the evolving office-of-the-future concept. The author trusts that consumers of this paper (knowledge workers) will relate to the insights expressed herein and embrace their role in transforming the workplace.

For more information on the concepts presented in this paper, contact the author at [wallsm@sas.upenn.edu](mailto:wallsm@sas.upenn.edu).