Net**Work**

The Future Workplace

Judith Heerwagen
Daniel Anderson
William Porter

Foreword

If there is one thing that hasn't slowed down during the economic difficulties of the last few years, it's the evolution of knowledge work. How and where people work has continued to change rapidly and profoundly, as has the menu of strategies organizations might use to support work. Yet many companies and organizations have, understandably, struggled to keep up with this change.

Our workplace-making industry is acutely aware of the tumultuous change going on. The way we think about, plan and use the physical work environment is shifting in several fundamental ways. Work is no longer where you go, but what you do. The nature of work continues to become more complex and more collaborative. Space is no longer an entitlement but a resource. Technology has enabled us to work anytime and anywhere, changing both the notion of "going to the office" and what happens at "the office" – whatever and wherever the office might be.

At Allsteel, we're riding these waves along with everyone else, and assessing the plethora of opinions about where things are going and what we should all be doing about it. There's a great quote from Edward O. Wilson[*] that expresses our collective challenge quite well:

> "We are drowning in information, while starving for wisdom. The world henceforth will be run by synthesizers, people able to put together the right information at the right time, think critically about it, and make important choices wisely."

As part of our efforts to understand what's happening and what the best minds in the field think about it, Allsteel asked three esteemed thought leaders to produce a critical synthesis of the current swirl of observation, shared assumption and real-estate strategies to provide new perspectives on how our industry might best support work, workers and organizations.

The authors are:

- Daniel P. Anderson, a partner at Anderson Porter Design and a lean-design practitioner affiliated with the Lean Construction Institute.

- Judith Heerwagen, Ph.D., environmental psychologist and now a Program Expert with the Office of Federal High Performance Green Buildings in the U.S. General Services Administration; editor of *Biophilic Design: The Theory, Science and Practice of Bringing buildings to Life.*

[*] E.O. Wilson, *Consilience: the Unity of Knowledge,* (New York: Vintage Books, 1998).

- William Porter, Ph.D., FAIA, a partner at Anderson Porter Design and former dean of the School of Architecture at Massachusetts Institute of Technology; co-author of *Excellence by Design: Transforming Workplace and Work Practice*.

Their paper proposes a model they've called "NetWork" as the next evolutionary step for analysis, strategy, design and provisioning of workplaces in a world in which the nature of knowledge work has changed rapidly and radically. NetWork is about truly shifting our focus from "place" to "work," and gaining a thorough understanding of *work* as the basis for workplace design.

The authors stress the importance of understanding knowledge work – now and as it continues to evolve – and the settings in which it takes place, admonishing that our existing approaches can't keep up and were never robust enough anyway.

NetWork's authors give us plenty to chew on. They summarize emerging social norms and the latest research on environmental psychology, offering powerful insights into how and where work happens. They emphasize that organizations need to provide settings beyond those traditionally provided by "the office" and to develop a robust capability to continuously adapt settings and provisions as work evolves over time. They suggest that mobility, collaboration and sustainable practices are clearly here to stay, but must be considered holistically, as part of a larger workplace strategy, in order to effectively support individuals and teams.

This material, along with a follow-on project Allsteel is just now starting, will allow us better to define knowledge work (especially in the context of emerging social norms) and effectively and efficiently translate that understanding to the design, provisioning and ongoing management of workplaces. We have already gained a much more thorough understanding of interaction and collaboration activities, for example, which is reflected in our new Gather product and its supporting materials.

Allsteel launched this project so that we can better support our industry partners – workplace strategists, design teams, real estate consultants – and the clients we all serve. For that reason, we are making the NetWork paper available to the industry and intend to exploit its insights in several ways. Also, what we are learning will inform our approach to developing products and services. It will make us better partners and contributors to all the stakeholders in workplace making.

– Jan Johnson
Vice President Design and Workplace Resources
Allsteel

I. The Roots of Change

Work isn't what it used to be

The nature of work and its social structures is shifting. Work has always taken place within a larger context of social and political dynamics – and also within more intimate communities of practice, each with its own social norms and culture that define the way individuals and groups behave and interact. What's new is that the landscape of work is increasingly complex and has far fewer geographic boundaries, while social and political norms are rapidly and continuously evolving.

Knowledge workers are now expected to adapt easily to new roles and ways of thinking and to many kinds of tasks and situations. Many knowledge-based tasks require reliable analytical and judgment skills to carry out work that is often new or unusual, complex and context-based with few rules and little time to prepare or to develop structured ways of working.

The Pew Research Center, *Wired* magazine and others have identified several key trends:

Power is shifting from more centralized organizational control to individuals, communities of practice and social networks. The Internet is a growing contributor to this shift. As influence and power are derived less from hoarding information and more by sharing it with others , workers' value to an organization will depend more on how much information they share and how central they are to the network than on their positions in the hierarchy.

In addition, workers now expect greater autonomy, more control over their jobs and the balance between work and private life, and more opportunities for self development.

Work and intellectual capabilities are now distributed and collective, rather than vested in individuals. Concepts, designs and solutions are more commonly the result of many minds working together. Project work has always had a collective element, but the Internet has made it enormously easier to distribute work and for multiple authors to contribute. Wikipedia may be the most notable example of this phenomenon.

Self-organizing groups are taking on challenges and creating solutions based on their collective knowledge and experience rather than relying on expertise and direction from above. Traditional organizational boundaries disappear as more knowledge work is carried out by fluid teams that form and reform as needed, connected to one another in a variety of ways. Communities of practice, now a critical component of work, are bound not by organizational affiliation but by common interests, problems and ideas. These communities may be loose networks for information sharing and mutual help, or more structured teams working on specific tasks or projects.

These changes in the patterns of relationships and work are also fueled by the increasing number of free agents – freelancers, consultants and so forth – involved in developing projects and products.

Making sense of large volumes of information and interactions requires analytical thinking and adaptive and social skills. Work is becoming more novel, extemporaneous and context-based. There are fewer rules, less structure and a broader array of situations and tasks. Memory and computation skills are becoming less important – computers do those things for us. On the other hand, analytical skills and critical thinking are more valuable than ever. With cascades of information available at the click of a mouse, organizations need people who can make sense of it. The combination of analytical skills and situational awareness will be important across work settings and may require new work roles, such as skilled facilitators and collaboration coaches.

The new "literacy" is based on the ability to build and use social networks – and not just virtually. New technology, software and media are providing new ways to connect and share information: one to many, many to many, one to one. The value of skills needed to manage this vast array of interactions is growing, i.e., skills in multimedia, simulation, role playing, narrative and communications.

And yet, as social media provide the infrastructure for developing relationships, face-to-face interaction may become *more* important for learning, mentoring and conversation. Social scientists and neuroscientists are concerned that the growing use of the Internet for social relationships diminishes people's ability to have conversations, read facial expressions, and interpret gestures and body language. Because so much work is now distributed, physical workplace design may need to create more opportunities for social interaction in order to strengthen these skills.

The more we live in a digital world, the more important it becomes to reconnect with the physical environment. We're spending more and more time working, socializing and playing in virtual settings. Communities of practice are expanding, effectively combining social and information networks. Games are becoming incredibly realistic – some in terms of sight and sound, while others replicate real life with virtual pets, babies, families, gardens. In Richard Louv's book, *Last Child in the Woods*,[*] a child says he prefers to be indoors rather than outdoors because "that is where the plugs are."

However, as we have noted, there are certain skills that are critical to successful face-to-face social interaction, and we only master those skills by using them. So the physical environment remains vital to communication, interaction and developing skills. We'll say more about the importance of balancing and integrating virtual and physical environments later on.

[*]Richard Louv, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*, (Chapel Hill, NC: Algonquin Books, 2005).

Sustainability is becoming a given. Public and private organizations are placing greater value on the importance of sustainability to environmental, social and economic well being. They also see it as a way to attract and retain young workers who are concerned with the quality and future of the environment. In "green" organizations, sustainability is a criterion for the development and evaluation of facilities, policies and work practices. Even organizations that do not fully embrace sustainability establish alternative work arrangements and shared workspaces in order to reduce costs for energy and space.

We think and behave differently

Humans have always been social animals. It is in our DNA to want to belong to a group, to have friends, to share information, to learn from others, to be held in high esteem. For most of human history, we have met our needs for social interaction by belonging to small groups – people we knew and interacted with face to face. The Internet has expanded the limits of our social circle enormously. It has created new and continually evolving ways for people to connect and to develop relationships that were unimaginable even 20 years ago.

We still socialize according to instincts that evolved to solve the problems of group living: whom to trust, how to detect cheaters, with whom to share, how to coordinate tasks. But we now belong to tribes and villages in which people are joined not by proximity or family but by common purpose, often through electronic media.

This new social paradigm is very recent. Twenty years ago long-distance communication was accomplished by phone, fax and mail. The social interaction necessary for knowledge work required that people congregate in one place. In the 1970s and 1980s environmental psychologists studying social behavior focused on issues of privacy, crowding and the culture of face-to-face interaction. Although these topics are still important, the emergence of digital culture has spawned studies of the way virtual interaction affects productivity, learning, teamwork, emotional functioning, neuro-cognitive processing, social effectiveness, social deviance and addictive behaviors.

The new social media enable new kinds of behavior and relationships. The Internet allows us to be constantly in contact with others. We can disseminate information widely and rapidly through a growing choice of media. We can immerse ourselves in virtual societies, virtual worlds. We can join and create multiple social networks and personalized applications to suit our preferences.

These new social behaviors can make organizations more or less effective, depending on how they are managed and integrated into work practices and culture. They include:

- *Alone together* – working in the presence of other people but not interacting with them. We don't want to be isolated – or maybe we draw energy from the buzz of people

around us. So we leave home and set up shop at Starbucks. Or we rent space in cowork centers, not just for the conveniences offered but for the society of others who live and work as we do.

- *Virtual together* – working with people in widely dispersed locations, connected through technologies like Skype, Web cams, Web-ex, IM and so on.

- *Virtual immersion* – using media to create, learn and play. Newer applications, including virtual games and virtual lives (such as Second Life) are now being used by organizations to develop skills and test knowledge in ways that are more engaging and realistic than standard training methods.

- *Random virtual encounters* – the virtual water cooler, corner bar or urban street. Internet applications can provide random connections to people located in different places. Forums, message boards and chat rooms draw strangers together, usually around some common interest, but there are also completely random-encounter Web sites like Chatroulette!.

- *Virtual self* – using technology to extend one's social presence. Realistic avatars stand in for people at virtual meetings, lectures, etc.

- *Virtual presence* – using video cameras to monitor what's happening at a remote site: a branch office, your new construction project, your home, your children's daycare center or your pet care service.

One aspect of the future is certain: The stream of new digital applications will continue to flow, and workers will adapt to them. One new challenge is also clear: to integrate new behavioral patterns with the old ones that we've long associated with the standard office model. We're still mastering how to design workspaces that enable face-to-face social interactions and collaboration, knowing how important these behaviors are to workers' performance and absorbing the organization's culture. Collaboration brings together the skills and knowledge of individuals and then builds collective knowledge and group capabilities. Yet when group work is done via digital networking by people who seldom or never sit down together, we're facing a new set of dynamics. We must learn to design for new behaviors, but, most important, our designs must simultaneously support both electronic interaction and the need to interact with real people in real settings.

A second challenge we now face was mentioned earlier: Without face-to-face interaction, we lose important social skills. As noted by Gary Small and Gigi Vorgan in their 2008 book *iBrain*, [*] "As the brain evolves and shifts its focus toward new technological skills, it drifts away from

[*] Gary Small and Gigi Vorgan*, iBrain: Surviving the Technological alteration of the Modern Mind*, (New York: Harper Collins, 2008).

fundamental social skills such as reading facial expressions during conversation or grasping the emotional content of a subtle gesture."

This idea reverberates in an article on electronic collaboration by Gary and Judith Olson, who argue that valuable kinds of nonverbal communication are lost when we go from face-to-face to virtual interaction and cannot be replaced by technology. This includes: rapid feedback that can clear up misunderstandings or disagreements; the ability to receive information from several sources in the room at once; access to physical context (product samples, informational materials on display, even the mood set by the room and the weather outside); informal "hall time" before and after meetings; and the ability of a speaker to control people's attention.

There is, in other words, a broad range of related behaviors that enhance effectiveness in communication and all aspects of social interaction that can only happen in person. Social intelligence develops slowly. We need effective social interaction to learn how to form working alliances, resolve conflict, engage in deep listening, and form mutual bonds based on empathy and understanding.

The nature of negotiations, group decision making and group management are, for example, critically dependent on people's ability to read subtle social cues, on eye contact, on observing others' reactions, and on private sidebar conversations. These activities change drastically when the players aren't in the same room, and seldom for the better.

Social scientists also worry about emotional effects of people spending too much time collaborating and socializing via digital media, as opposed to real-world interaction with colleagues and friends. A front-page article in the *New York Times*[*] notes that people get so attached to their digital devices they often experience a sense of loss and even depression when not connected.

And computational scientist Sandy Pentland argues that social interaction with peers at a local level is vitally important, because it increases energy levels and creates a sense of "contagious excitement." That's not so easy to accomplish via the company intranet.

One last concern – in today's workplace, running lean, multitasking and information overload often leave people in a state of chronic "partial attention." This lack of time and ability to focus cuts into the deep thinking and reflection that form the foundation of much knowledge work (Small and Vorgan in *iBrain*).[†]

[*] "Attached to Technology and Paying a Price," *New York Times*, June 7, 2010.
[†] Small and Vorgan, op. cit.

We now work here, there and everywhere

The current trends in work, the workforce, work practices and work settings are driven by a broad range of factors, including technology developments, shifting markets, the location of resources and expertise, changing regulations, transportation, sustainability, workforce mobility and preferences for quality of life.

Electronic connections to people and information allow many work tasks to be independent of a specific setting. Social media, shared document sites, laptop video conferencing, teleconferencing and Web-enabled meetings allow expertise to be tapped wherever it is located. The functional need to be physically collocated and working face to face is greatly diminished today compared to a few decades ago. People can now view documents together, manage projects, provide expert advice, coordinate tasks, develop relationships, and respond to information requests without being co-located in an office.

The workforce is increasingly mobile. According to IDC,[*] a global market intelligence firm, the number of mobile workers in the world passed the one billion mark in 2010 and is expected to reach 1.2 billion by 2013. The range of available and suitable work settings will likely expand proportionally. This is due not only to the penchant of the younger generation ("digital natives") for mobile and social technologies, but also to the increased number of individual contractors who work by themselves or with other free agents. This population works not in offices but in their homes and a variety of other places, including client offices when they are hired for project work.

In this new landscape, distinctions between working and socializing are blurring, and workers expect much greater choice regarding work location and work-life balance.

All these factors have changed the real-world geography of work. We can work at the office, at home and almost anywhere else, and because we can, we do.

So far, these "anywhere else" choices are mostly what Ray Oldenburg called "third places" in his 1989 book *The Great Good Place*.[†] Third places are social places that contribute to a community identity – like restaurants and cafés – but also include libraries and other public spaces. People usually choose third places that provide engaging, welcoming environments – accessible, convenient places where people easily socialize. Other third places, like airports, aren't as amenable, but we work in them anyway.

For individuals, there are opportunities outside the office. Third places have become a popular, viable alternative to working at home. For all the benefits of the home office, many people complain that they feel isolated and lack the social stimulation needed for creative

[*] *Worldwide Mobile Worker Population 2007-2011 Forecast*, International Data Corporation Framingham, MA.
[†] Ray Oldenburg, *The Great Good Place: Cafes, Coffee Shops, Community Centers, General Stores, Bars, Hangouts, and How They Get You Through the Day* (New York: Paragon Books, 1989).

thinking. Many people compensate for physical isolation by connecting to others via social media and "virtual water coolers" like chat rooms and forums, as well as connecting to their work colleagues via the Internet. But feeling connected to others is also one of the main reasons people choose to go to the office or to third places like coffee shops and libraries.

In the past decade we have seen the café environment evolve from a place to meet a friend into a vital workplace fueled by caffeine and having its own social life. The technology that enables this phenomenon began with laptops and cell phones and is now even better supported by cloud computing, smart phones and a burgeoning selection of applications for both social networking and productivity. For many, the allure of these third places is that they are more than social environments; they can support some individual work activities, but they have the added benefit of not obligating the user to interact with others as one must in an office.

Most third places are not deliberately designed as workspaces, but rather to support activities such as waiting (the doctor's office or hotel lobby), drinking coffee and gossiping (the café), or transportation (airports, airplanes, trains, buses, even cars.) We are forced to adjust. Lighting and furniture ergonomics are usually an afterthought at best. There is little in the way of security and privacy. Food choices may be limited and poor in quality and nutritional value. Even the basic work affordances, like plugs and horizontal work surfaces, are often in short supply.

The next evolutionary step, then, is the creation of other, alternative places deliberately designed for work that people can use on either a lease or drop-in basis. Demand may come from individual contractors, the underemployed, the would-be entrepreneur or the commute-avoiding employee – those who are doing more structured work and looking for higher levels of emotional, social and physical support than is provided in first and ordinary third places. In our study of third places, we identified *cowork* centers and other places that are becoming an important part of the new working world – and may even be relied on by an organization as an integral part of their mobility program as one of many settings people can choose. To dramatize their growing importance as well as their distinctiveness, Richard Florida has dubbed these specialized third places as "fourth places."

But for the mobile worker, opportunities for collaboration are not easy to find or manage. As challenging as it is to accommodate individuals' work in a multiplicity of places, it's even harder to accommodate group work under these circumstances – to provide for collaboration that is efficient *and* effective. Tapping group members' individual and collective knowledge is critical to effective collaboration on specific work assignments.

In the past, collaboration has typically occurred in a single place and face to face. This pattern is so common we often fail to appreciate its subtlety. Little has been done outside of the business consulting community to thoughtfully describe its physical requirements and dynamics. Now, however, there are even more compelling reasons to do so, as collaboration has moved into

the realm of the virtual, the work done by distributed teams. A new set of dynamics must be addressed if collaboration is to be optimally effective.

To the extent that collaboration is simply the sum of the contributions of many different minds, it is the same whether the work occurs in a single space or many. But collaboration is more than that. It is the product of *interaction* between minds, and the contributions of each and especially of the group may change substantially as a result. When it happens across multiple places, special problems arise. We lose the nonverbal redundant cues, the unspoken ways we confirm understanding. So, in order understand what we lose in remote communication, we need to study and reveal the invisible infrastructure of face-to-face communication. A well-articulated understanding of the processes and activities involved will enable strategic management, and we will better anticipate the requirements of specific workplaces and the networks that connect them.

There are aspects of effective collaboration that are outside the scope of workplace strategists, designers and real estate managers – factors that can only be addressed by management. Collaboration, especially remote collaboration, requires good team composition so that the range of expertise addresses the problems at hand. The team needs leadership to define roles and relationships, rules of the collaboration game, behavioral guidelines, and other factors to facilitate mutual understanding and expectations, group identity, group learning, accountability and mutual trust. Laying this groundwork will enable collaborators to share mental models, to make sense out complex moments in the process, and to override rules when necessary while retaining the trust of the group.

This understanding of group dynamics also suggests ways to observe whether the group is making progress beyond the usual way of tracking movement along the work project plan – including milestones and task completion – that presumably guides the team. These include such things as the emergence of special languages and favored metaphors, analogies and references. Other signs of group progress include the *divergence, convergence, filiation, propagation,* and *linkage* of ideas.

In both virtual and place-based collaborations, then, it is critical to make the *progress* of the collaboration visible to all the members of the team, as well as to management. While periodically comparing progress to the original project plan enhances effectiveness, there is plenty of room for innovation with regard to the means of keeping individuals informed of their team's progress. These observations could form the basis for a dashboard that could inform team members as well as leaders of the status and the progress of their collaboration.

Finally, as with all group work there are certain steps leadership can take to minimize blunders and support efforts for ongoing and continuous improvement. Leaders need to discourage cheap chorusing and encourage *affective* and *gestural* communication. Members should question authority and ideas that have become institutionally entrenched and actively use their experience to identify opportunities for improvement. Groups must learn to see problems as they really are, rather than distort them to fit the limits of existing tools and their makers.

"The office" still matters

What we have traditionally defined as "the office" provides an intentionally designed environment to support focused work, collaboration, learning and social interactions. As we argued above, many kinds of interaction can only take place effectively face to face. That means that some types of work are difficult or undesirable to do at home or in third-place settings. These include:

- Jobs dealing with sensitive, confidential or secret information
- Use of special equipment that cannot be accessed from home or other settings
- Stages of product development or project work that require intense collaboration
- Learning that requires discussion and debate rather than mere reading
- Mentoring relationships that rely on observations and tacit learning
- Jobs for which ongoing communication between employees is critical
- Developing social networks and work relationships that are buttressed by informal and spontaneous interaction

For most other types of work, physical presence may not be necessary. However, personal preferences and overall capabilities may be important factors in deciding which people are best suited for working in multiple locations. Some people are ineffective or merely unhappy working in remote locations. Being organized, motivated and able to work without supervision are all key characteristics of successful mobile workers. Also, people clearly enjoy the opportunity to develop friendships at work and to have opportunities for work interaction and conversation.

Yet while we vigorously defend the existence of the office, we would also argue that we need to rethink most of the assumptions about it.

The *activities* the office is designed to support are shifting. The 2008 edition of Gensler's periodic workplace study[*] suggested that, as a blended average across all types of workers, time spent *focusing* is about 48%. The other three modes the study identified – *collaboration, learning and socializing* – made up 52% of workers' time. Yet even today our workplaces are still mostly designed for focused work. Moreover their design is focused on the quantitative aspects of space – the number of conference rooms, workstation size, office densities, the percentage of private offices versus workstations and so forth. Rarely do projects begin with behavioral analysis. What do people actually do? What are their critical processes? How do they interact with others? How can we better support individual and group behaviors? How do different spaces, technologies and artifacts influence work patterns and practices?

Also, those behaviors are continually altered by what new technology enables and what organizations need from their teams. Big changes in the way people work and collaborate have already happened, and more change is coming all the time.

People now work in many other places that are not designed to fit the work. Instead, people are forced to adjust their behaviors and expectations to fit the setting. They may sit in a spot with poor lighting in order to find a plug for their computer. They seek out social buzz to overcome the isolation of working at home, yet find the café atmosphere uncomfortable and lacking needed services and amenities. Or they work in distributed teams connected by technology that doesn't provide the social and communication benefits enjoyed by teams that work under one roof.

So what does all this mean to the workplace?

For starters, we need to agree that work is not *where* you go, it's what you *do*.

And given that people are doing their work in so many places that are out of the control and influence of designers, owners and managers, we need to go beyond rethinking the ways we plan, provision and manage the *workplace*. We need to develop the mindset and capabilities to provision the mobile *worker*. Of course, we already do so to a great extent, as IT provides laptops, Blackberries, wireless cards, conference-call cards and the like. But we need to incorporate that kind of support into a larger, holistic approach that catches up with what's happened *and* anticipates the future.

If we look at the workplace as *a system of settings,* we think it's obvious that new and ever-changing patterns of work require a broader range of those settings than we have provided in the past, specialized to accommodate a broader range of specific behaviors. Those we *can* control or influence need to be thoughtfully, purposefully designed, yet "loose" enough so that

[*] 2*008 Workplace Survey – United States,* Gensler Design and Performance Report, 2008.

workers can adapt them sustainably and efficiently over time to new behaviors or requirements.

All this means we need to transform the way we develop strategies to successfully support work *and* workers through the promotion of effective behaviors wherever they need to occur. For example, with the new tendency to do individual work anywhere, the purpose of the office may shift to a venue for face-to-face collaboration and training. That scenario might require settings for in-person training and for methods of learning that range from "classroom" settings to one-on-one mentoring. These "actually together" settings and behaviors will coexist with virtual, technology-assisted settings and require new protocols for e-learning, teamwork and remote conferencing.

❖

In response to shifts in work and social and political structures, we must expand our thinking in two critical dimensions: first, to provision *workers* to be successful users of the myriad of spaces (physical and virtual) they may need to use; second, to provide or enable the full range of new *work settings* that are needed to support emerging and evolving work patterns and practices.

II. NetWork

We propose *NetWork* as the much-needed next step in the evolution of workplace making and management. NetWork is broader and more inclusive than the traditional concepts of workplace. It opens the door to new and powerful ways to support work and the people who perform it.

NetWork encompasses both *how and where* work is done and *how* these workers, processes and places are supported. What distinguishes NetWork from past descriptions of the workplace is that it focuses first on the work that is to be done – and on how to enable it to be done most effectively. In turn, that knowledge helps us to provision *both* the worker and workplaces with furnishings, technologies, equipment and infrastructure that enable workers to make the best of wherever they work, to develop effective work practices, and to continue to adapt. This contrasts with the more traditional focus, which addresses only the *places* of work, and their efficient delivery and maintenance.

In other words, NetWork addresses *all* the places and circumstances in which the work is carried out – even those that the organization does not control or influence. It also includes policies and organizational support of its components so that they remain effective in a world that is constantly changing socially and technologically.

NetWork leverages lean* principles. It is **dynamic**, deploying resources just in time when and where they are needed and adapting to changing requirements. It is **efficient**, absorbing rapid continuous improvements that reduce waste and inefficiency. It is **value-oriented**, improving work practices and their effectiveness.

NetWork addresses the challenges we described in Part 1 – those posed by:

- shifts in the way people think, behave and interact;
- working in places that are not under the control or influence of an organization and not designed for individual or group work;
- supporting work groups, teams and communities of practice even when they are dispersed geographically and lack opportunities for face-to-face communication.

---

* From Wikipedia: **Lean manufacturing**, **lean enterprise**, or **lean production**, often simply, "**Lean**," is a practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. Working from the perspective of the customer who consumes a product or service, "value" is defined as any action or process that a customer would be willing to pay for. Essentially, lean is centered on *preserving value with less work*.

NetWork is both the supporting platform and the interconnected infrastructure and settings in which work occurs. Its ultimate purpose is to increase the organization's ability to carry out its program of work. To achieve this end, designers and workplace strategists need to start with thoughtful analysis of their *most critical* business processes – and the purpose, flow, behaviors and practices behind them. *While investigating or improving business processes is typically outside the scope of designers, workplace strategists and real estate and facilities service providers, NetWork presents the opportunity to truly link business processes (and even their transformation) to the workplace.* Starting here moves us beyond oversimplified, one-plan-fits-all design to create relevant, effective work settings. Defining the specific causal relationships between work, its purpose and its supporting behaviors and resulting settings is the first step in designing the NetWork.

Analyzing Work

"Work" is a term that loosely refers to everything thought about and done to produce something. Work is purposeful and takes form in some kind of activity. It acts upon materials, physical or virtual, to transform them into something intended. The idea of work encompasses an entire range of activities that includes:

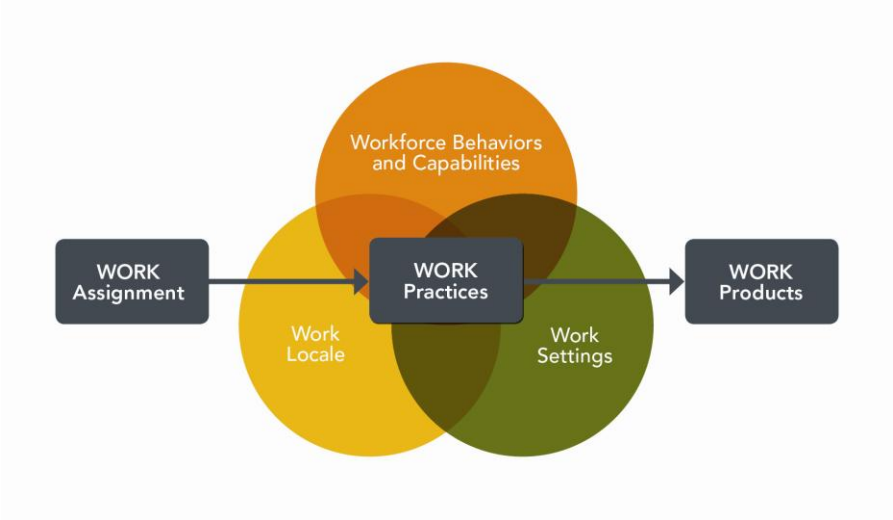
- first thoughts of what should be done;
- defining the work so that it can be translated into a program of activities;
- a set of resources including people, materials, and settings;
- a set of tasks that relate to the skills and capabilities of those being asked to carry them out;
- and criteria by which to judge the success or failure of the effort.

Increasingly, work is carried out in teams, often working face-to-face but with increasing frequency working remotely in teams that are geographically distributed. And the nature of the work, at least in the U.S., has shifted toward service industries and knowledge work and away from manufacturing and agriculture.

We have found it helpful to call attention to three phases in the work development cycle: **work assignment**, **work practices**, and **work product**. The work assignment emerges from processes related to the organization's mission, capabilities and history. The assignment might specify what is to be done, a schedule, a budget and resources to accomplish it. Work practices that actually arise to accomplish the assigned tasks are a function of the capabilities and behaviors of the workforce, the resources and the culture of the locales in which the work occurs, and the specific affordances of the work settings. The stream of work activity that flows from the

assignment results from the merging of these three contexts. In every case a judgment must be made as to whether the desired work assignment can be carried out, given all these factors, and there are many instances when the original assignment has had to be changed or abandoned.

Diagram 1. Three Contexts for Work Practice



The **behaviors and capabilities** of individuals and groups who make up the project team are major factors in how work practices develop. Because every group has a unique combination of expertise and personalities, each will approach a problem in its own way. Moreover, the group's social and leadership skills have a big impact on how effective collaboration will be. Thus the assignment does not, by itself, determine the kind of support needed by the group assigned to the work.

Another context is the **setting** for work. Today physical and virtual settings for work merge with one another to create the total setting for work. The spatial characteristics, equipment, furnishings and infrastructure of each physical setting will affect what can be done and when. The same can be said of virtual settings where such characteristics as convenience, graphic clarity, speed of connection, capacity, security and system interoperability are important factors. If *settings* can't provide what's needed, then it becomes critically important that the *worker* should be appropriately equipped. This last point requires particular attention when physical settings are outside the traditional workplace or when virtual settings are handled even in part by outside providers.

Locale may facilitate or restrict how the work is carried out. The local culture may set limits on what can be expected of people and what they are prepared to do. Locally available resources and facilities can enable or restrict how people conduct their work and even how they live their lives.

While it might seem that a work assignment can be carried by anyone who brings the appropriate capabilities to the table, these three contexts have a profound influence on how work gets done and, therefore, on how it might best be supported (see sidebar.)

Thus, to achieve organizational objectives, management strategies must include infrastructure that lets people in various settings and locales operate together while insuring security, access and availability. While behavior, settings and locales are the main factors that influence the development of work practices, they are not the only ones. Work practices will also be shaped by the requirements and the character of the project team, but may also be influenced by other communities of which the individuals and the team are members.

These **work practice communities** or communities of practice (COPs) are important to individuals for such reasons as earning professional accreditation, acquiring knowledge, maintaining communication with specialized groups, and helping them play out organizational roles. When they become members of organizations and project teams they bring these communities of practice with them. These enhance the individual's performance, and they can make substantial contributions to a project team's work. Moreover, they add strength to the organization.

Context and culture

The idea that behaviors, capabilities, setting and locale influence how work gets done draws much of its strength from these three notions:

- **Situated learning** – the idea that work practices are learned in (and shaped by) specific contexts and embedded within a particular social and physical environment. Both Inuits and Polynesians catch and eat fish, but the former fish through the ice with spears or hook and line, while the latter fish with nets and outrigger canoes.

- **Affordance** – the idea that objects and environments have qualities that enable an individual to perform an action, as well as qualities that can inhibit action. The affordances of the team's environment will help shape the work practices that develop – for better *or* worse. Remember the old saying that when all you have is a hammer, every problem looks like a nail? As form follows function, the affordances of the environments we provide need to suit the specific nature of the work *and* optimize the work practices the team develops.

- **Constructivism** – the idea that the knowledge and meaning that humans generate from their experiences are integral to how they communicate and understand. The mystery of odd-looking artifacts from other cultures dramatizes this concept. By studying that culture, anthropologists may discover how an artifact embodies the experience and the belief system of the people who made it.

These concepts reveal that work practice is not merely a function of people doing what they are supposed to do.

Project teams themselves may gravitate to other groups within and outside their organizations that are working on similar problems or developing similar technologies. Enabling the individual to participate in these communities of practice simply makes sense, as it supports lifelong learning and growth. And enabling project teams to do the same can improve their work.

Work practices, then, result from what people make of the resources available to them in order to do what they have to do. They are a function of the beliefs and cultural and geographic characteristics of the locale, capabilities and expertise of individuals and their abilities to communicate, collaborate and organize. They are also enabled or limited by the resources people have to work with, the control they have over those resources, and how adaptable those resources are to new requirements.

How NetWork works

Our model for NetWork is a more complete approach to the support for work based on:

- thoroughly understanding what work is and how it is carried out ;
- provisioning individuals, teams and the places over which the organization has control or influence.

The NetWork platform of support, then, results from an active, ongoing and integrated program of understanding, provisioning and managing work.

It exists first to understand the needs and activities of project teams and individual workers and translate that understanding into requirements for settings, affordances and infrastructure (both for physical settings and mobile workers.) The people who make up the project team, for example, need to be supported throughout the life of a project and in *all* the places they work – those organized and provisioned by the organization as well as others. This may not be as obvious for the worker who goes regularly to a single office, but it is important for the mobile worker who needs to be able to work in a variety of circumstances and at any hour. Mobile workers also need continuous contact with members of the team as well as access to the resources required to carry out the work. Moreover, this understanding must periodically be refreshed and updated.

Second, the NetWork platform of support serves to adapt existing resources or create new work settings and their infrastructure – including those tools and protocols needed by workers outside of the places controlled by their employer. Third, it manages this system of settings, infrastructure and support over time as needs change.

Finally, NetWork recognizes that while there are still many workplaces that follow the traditional model – with the emphasis on “place” – the future lies in the new and growing reality of work distributed asynchronously across multiple physical and virtual settings. In this new model, organizational support must:

- flow directly to teams and individuals;

- create or supplement available resources for the communications infrastructure and for continuity of work;

- create needed settings that any particular locale does not provide.

Some locales provide an abundance of settings for short- or longer-term occupancy and for varying purposes; others do not. As work becomes increasingly mobile, and as pressure grows to reduce real estate expenses and long-term commitments, the need to take advantage of what the locale has to offer may make increasing sense.

As we mentioned in Part One, a variety of new enterprises has sprung up catering to the need for places more conducive to work – what Richard Florida calls *fourth* places. By his definition, these differ from third places in that, unlike a Starbucks, they are intentionally designed to support work. Regus is one example, offering executive offices for short-term occupancy with some communal resources. Other examples include independent innovation centers or business incubators that afford short-term leases and contact with venture capitalists. Other alternatives, such as coworking, provide individuals with on-demand workspace and access to communities of like individuals and interests,

Also, the communications infrastructure now required by a distributed workforce can be outsourced from providers who can usually fulfill needs for mobility, security and privacy. The organization then has the choice to complement outside providers' offerings only where necessary to serve the specialized needs of its project teams.

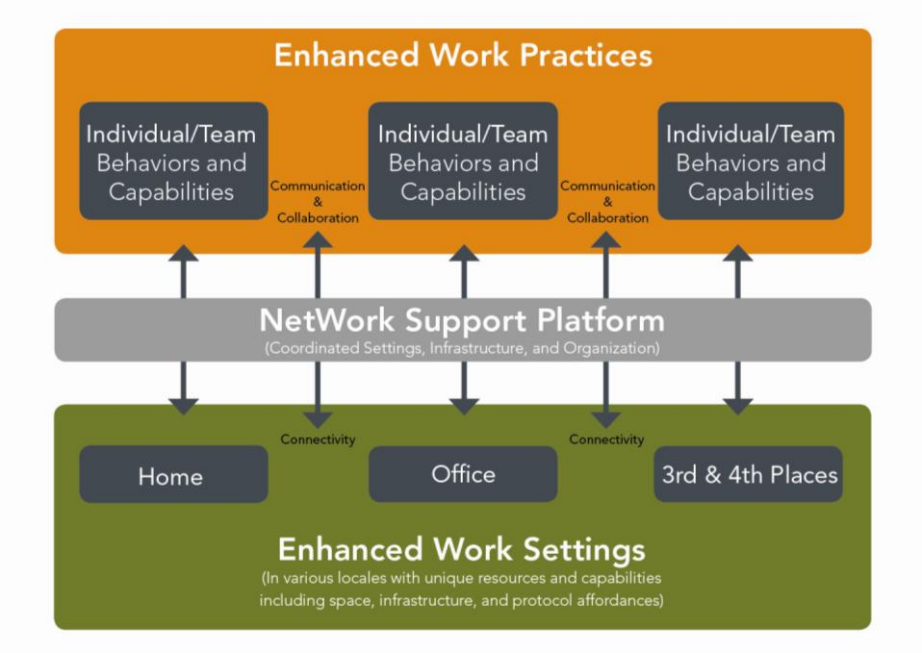
However, there may be highly specialized functions or technologies, like high definition video conferencing, laboratories, or workshops that require the creation of new settings that *are* under the organization's direct control or influence.

The NetWork support platform

The NetWork support platform, then, results from a comprehensive approach to the effective and efficient support of project teams and specific work practices across the entire NetWork.

The support platform is both *process* and *product*; it incorporates what is required to *design* the platform, to *implement* it, and to *run* it. It consists of a minimum, standardized, "loose-fit" platform adaptable to nearly all practices and settings, augmented by the specialized modifications and improvements needed by each community of practice and its particular locales and settings. The support platform must be adaptable to the specific locale and potential resources (like outsourced infrastructure support) surrounding each collection of settings, and it has to be responsive to the work practices of individuals and teams working in those settings.

Diagram 2. NetWork, the Workplace of the Future



The NetWork support platform is more than a set of elements – it is also an engine for improving work. Its performance is optimized when organizational structures and management approaches align to provide sufficient and relevant resources for the work platform.

These structures and approaches should address not only real estate, furnishings, equipment, services and infrastructure, but also management strategies, incentive systems and new ways of working. Management strategies ought to incorporate explicit performance management, mentoring, training and effective project teaming. Incentives may include bonuses and rewards, innovative performance assessment, setting goals and expectations, building morale, and methods of engaging individual choice, preference and input.

Communication, information and enterprise technology platforms will also be required to provide access, ubiquity, interoperability, security and personalization across physical and virtual locations.

Implications for workplace design

As we have discussed, work now encompasses a broad range of behaviors, activities and practices. People work in a wide variety of places, many of which are not designed to support their work needs and behaviors. In order to adequately support work and maintain communities of practice, we need a better understanding of work practices and the settings in which they can optimally take place. We need new ways of "seeing" work and work practices.

In order to make the NetWork function, we also need new models for *making* (or enabling) and *managing* workplaces that encompass a range of home, office, third and fourth places and that address the needs and preferences of mobile and stationary workers. The most important thing designers can do is to engage in thoughtful analysis of what behaviors and processes are most important and then design the settings to support them:

- What do workers need in order to make them effective at any location?
- What needs are not satisfied by settings that are currently available?
- What settings and provisions are needed to complement those and to fulfill the unmet needs?

Effective work settings emerge from design that is purposeful rather than generic. Developing more specific processes and tools to discover the specific interconnections between work and settings within the organization is the necessary first step toward designing an effective support platform for the NetWork.

❖

This network of settings and the resulting platform of support need to derive from our close and informed observation of existing work practices, our professional understanding of how better to provide for those practices, and the humbling fact that designers and planners aren't clairvoyant. That is, one of the most important provisions we can give workers and teams is the flexibility and incentive to adapt their settings to the work practices they themselves develop and to the change that will inevitably come.

3. Implementing NetWork

NetWork requires that we add to the body of knowledge and rethink the processes and tools we've traditionally used to make and manage the workplace. And that road is not without a few obstacles.

The challenges NetWork has to address

Old definitions of "the workplace." Workplace strategy must now provide infrastructure and capabilities to support work settings and practices that take place outside as well as within the confines of the office. The paradigm (and its cost structure) must shift from "one seat per person" to whatever combination of settings and capacities is most efficient and effective, including settings an organization doesn't own.

We are faced with new challenges in providing support for distributed workforces where people often work in areas *not* designed, provisioned and managed by their employers. These include:

- providing new and varied services, often from a reduced pool of resources;
- creating a shared sense of identity, connectedness, pride and objective;
- supporting innovation and other complex, collaborative work practices;
- providing simple, easy access to information from remote locations while maintaining security;
- ensuring that the workers' basic needs for safety and productivity are met.

To create this new, distributed workplace most efficiently, the organization must strategically supplement or complement resources and facilities that are already out there. Virtual communication and collaboration can build on the Internet and the fast-developing world of software, for example.

Resistance to change. Changing the way an enterprise has conceived and designed its workplace can be difficult. The patterns and perceptions of how and where work has always been done and supported are usually deeply entrenched. We've always done it this way. It works fine. People fear what they don't understand. Change is stressful.

Resistance to change is often the result of several factors tangled together, such as the inertia of legacy patterns, a sense of entitlement, and the difficulty of envisioning alternatives. The organization might be biased toward old patterns and behaviors – "actual together" real-space interactions, management by walking around, or the prejudice that people only become acculturated through physical presence and participation with one's team or in the classroom. The organization might lack the capacity or the sense of urgency or a compelling reason to change the way things are done. Objectives and criteria might be too narrow or incomplete, because they represent only the views or agendas of a given organizational silo rather than the bigger picture of the entire enterprise.

Also, organizations vary in size, maturity and focus; their needs and values evolve over the life of the enterprise. This rarely explored dynamic must be considered along with the reality that work and behaviors have already changed and will continue to do so.

Developing an approach that integrates these factors with changes in work practices and work settings is critical. The more subtle challenge is integrating new practices with those elements of the existing work culture that are the most positive and valuable.

Primitive models for understanding work. The conventional methods of mapping and describing work are crude and simplistic. They aren't adequate for identifying and understanding emerging behavioral settings and changes in work practices (and their implications) or the performance requirements and metrics for a given group's work, and they don't tell us how to design for these factors. And when our methods don't tell us which specific affordances "fit" the work in various work settings, we're not able to leverage or duplicate them.

As we have discussed, *work practices* are patterns of activities that emerge out of the actual *settings* of individuals performing work in specific *locales*. Work practices may not be fully understood or appreciated until they can be observed in the *setting* in which they are enacted. Therefore, more-accurate descriptions of *new* work practices and related, required social protocols must be established as part of the common vocabulary of the NetWork and its components. Developing this new lexicon will help us to predict outcomes and to adapt the NetWork support platform to the specific and unique work practices that evolve in each setting, within each locale.

The nomenclature of space configurations is also ambiguous – we don't yet have a mature standard vocabulary to describe evolving work settings and their characteristics. For example, the vague term "workstyle" fails to address what people actually do in different settings, and therefore provides no direction on how best to support these varying behaviors.

Little or no infrastructure for continuous improvement. We must realize that work, social behaviors and technology continue to evolve and will require frequent, even continuous re-evaluation and adjustment of the work settings developed to support them. One of the problems of associated with change is that we cannot fully predict how workers will adapt to new assignments or new settings. Therefore we have to design and provision the workplace so that it can be adapted to new work practices that may emerge, and we have to track the process closely in order to make needed adjustments that are beyond the capacity of individuals and teams to make themselves.

Limited understanding of organizational context. As mentioned above, the overall stage of development of an organization is another dynamic that must be understood and considered, because its influence will be felt in almost every area of workplace strategy, even as the organization continues to evolve. For instance, it seems obvious that the characteristics, needs and work patterns of a startup are different from those of a long-established organization that is no longer growing rapidly. Therefore, it is important not only to get the "fit" right, but also to enable continuous evaluation and adaptation as the organization's values, priorities, focus, capabilities, size and complexity change. Once again, we need to develop and apply models that allow us to uncover, interpret and act on these differences – and provide for adaptability the organization will need as it continues to evolve.

No shared vocabulary for work practices and workplaces. New behaviors, activities, roles and affordances require a new vocabulary, so that we can all communicate and understand new concepts easily and efficiently. This new lexicon will continue to evolve as we catch up with the

changes that have already taken place and anticipate what's next. Appendix 2 at the end of this paper presents a good start on this new vocabulary, including the terms defined in the list of "new behaviors" just below.

Further, given the shifts in the nature of work and social structures we have described, we believe new work *behaviors* will emerge across the NetWork – including a range of new collaborative work activities – as will new work *roles*, including **mediator**, **curator** and **technology coach**.

Emerging behaviors

Work today is more cognitively complex, more team-based, and more dependent on social skills as well as technological competence. And all these competencies need continuous development and improvement. Further, the geographic distribution of work requires that workers possess social literacy and good virtual communication skills. While it is the responsibility of the organization and the workers themselves to develop and maintain these skills and competencies, the NetWork must support the set of practices and behaviors that the work of the organization requires.

Therefore, in order to begin implementing the NetWork concept, we need to consider *how* work gets done – specifically, what kinds of behaviors and activities will need to be supported and what affordances each setting will need to provide that support.

The set of behaviors that characterize knowledge work patterns will change as work evolves, so it will need to be reviewed and updated periodically.

That said, we have identified several key behaviors:

Presence – being present at work, virtually or literally, having one's presence known and acknowledged in some way

Availability – being at hand when needed, either in person or electronically

Rapid meetings and gatherings – the ability to have meetings on short notice, virtually or in person

Collaboration in a variety of forms – dyads, small groups, large groups with varying needs and agendas, from simple coordination and progress checks to brainstorming, problem solving and creative development. The NetWork needs to support both virtual and face-to-face collaboration, and combinations thereof, for successful transfer and sharing of knowledge.

Visualization – the ability to display and manipulate concepts, data, drawings, maps, etc., to aid discussion and understanding

Confirmation – the ability to know whether what you have said is understood and how people are responding

Reflection – internal focus, thinking, writing, maintaining concentration

Knowing who knows what – building internal and external communities of practice; creating knowledge networks via social connections

Professional intimacy – gaining a deeper sense of the other person so that one can make subtler judgments of colleagues' abilities, expertise and the way they think, an activity that requires organizations to provide opportunities for face-to-face interaction

Sociability – encouraging social interaction to support friendships, emotional trust and a sense of community

Archiving – storing, cataloging and providing easy access to documents and data

Research – providing access to source materials, documents, media, data, and to the tools and programs for data analysis

Hospitality – making members and visitors feel welcome, comfortable and cared for, both within the space and when they enter the workplace virtually

Table 1 in Appendix 2 should be of great interest to workplace strategists, designers and real estate managers. It describes in more detail these key behaviors and begins to outline the affordances (spatial, physical infrastructure and technological) needed in settings to enable them.

Each of these behaviors can be supported in many ways. For example, reflection may be enhanced by having access to windows with distant views or being able to work alone in a quiet café or in the privacy of an enclosed room. As we have suggested, to support the full range of behaviors we will need not only to take advantage of new technologies and applications, but also to address the challenges they pose. For instance, we have great new technologies and applications to support virtual collaboration, but the loss of face-to-face interaction presents new challenges: How do we support the critical communication that occurs via the nuances of social behavior? How do we create a sense of belonging?

Identifying the characteristics of settings

As distinctions between working and socializing are blurring, so are traditional definitions of place. First, second, third and fourth places (home, office, and the larger community) can now be reinterpreted as an array of settings that enable multiple interactions and activities. The office can be reconceived as a hub for learning and working, rather than a container for people. The concept of home can change from a place to live to a flexible setting for personal time. The larger community is transformed from a range of coworking and social spaces to a Venn diagram of overlapping functions.

Not all settings in the NetWork are the same, nor are they intended to support the full range of behaviors. In fact, multiple work settings *coexist and overlap* within a range of spaces available

at any particular locale. To leverage this expanded range of places, the characteristics of work settings must be identified more precisely, and, as we have noted, a new descriptive vocabulary for work programs and behaviors must be developed. This new vocabulary needs to apply across all settings, regardless of their location, place and context. Settings must be understood as configurations of spaces and objects with characteristics of shape, arrangement and dimension.

What we call *affordances* (physical and spatial configurations that enable or constrain particular kinds of behaviors) must be purposefully selected. The specific characteristics of each setting support some work programs and behaviors and preclude others. A new taxonomy of affordances is emerging, and we must develop it with a better understanding of how various affordances enable or limit effective work behaviors in specific locales.

The task of identifying affordances begins with an analysis of what setting's functional purpose is and what kinds of behaviors it needs to support – with regard to social, cognitive, physical, movement and ergonomic matters. A setting such as an informal meeting area will be different from an extreme collaboration space. A drop-in work setting will be different from a project team space.

Implications for workplace strategy

In addition to what we'd identified in the beginning of this section, challenges in shaping workplace strategy and provisioning workers and workplaces include:

- the changing nature and definition of the customer for workplaces;
- the many different environments in which work will occur;
- our tendency to rely on conventional wisdom – the principles we assume to be valid because everyone repeats them – instead of investing the resources necessary to gaining a thorough understanding of specific work practices and their performance requirements;
- the investment of further resources to continue to monitor and adapt the NetWork to changes in requirements and resources.

Our strategies and the infrastructure we create to manage the NetWork over time must adequately address these issues. If they don't, the persistence of existing patterns will overwhelm ongoing innovation and adaptation.
These six principles summarize key concepts behind conceiving and designing the NetWork:

1. The range of **stakeholders** for workplace design must include **workers** themselves, as well as the administrative **managers** of the workplace provisioning system. Carefully defining the customers for workplace services is a critical first step in the development of strategy. As the workforce becomes more dispersed and operates under a greater variety of conditions, it becomes more important to service individuals and groups directly and to consider their effectiveness to be at least as critical as the efficient management of the workplace. NetWork assumes responsibility for both. This is especially relevant at a time when many experts are seeing a substantial shift in organizational power dynamics from top-down to bottom-up.

2. The strategy must address how to enable individuals to **adapt to and manage** the variety of circumstances in which they need to function. The same is true for project groups, especially when they are asked to work on ideas and products that take them into uncharted territory. Since ongoing adaptation is critical to the NetWork's success, the freedom and affordances it requires should be in the hands of the users themselves – that is, workers should be both empowered and equipped to adapt their work settings as the nature of their work and work practices changes.

3. Provisioning of workplaces also needs to accommodate the new **diversity of locations and types of workplaces** and the **new styles of working**. Systems are often stuck in old patterns that don't adequately serve new ways of working. One-size-fits-all may be more efficient to manage, but it can't adequately meet the needs of a diverse workforce, a broad range of activities, and all the other ways in which work practices may differ.

4. The workplace strategy must accommodate **evolution**, because it is inevitable. The rapid change we're seeing in factors such as methods of collaboration, information technology and systems of organizational support require innovative and agile provisioning. Workplace making should no longer be thought of as an event, but as an ongoing effort requiring continuous improvement. Structural and procedural change is likely needed to manage this.

5. **Senior management** has the opportunity to leverage the workplace to achieve closer **alignment** with existing and emerging business objectives, higher levels of **performance**, greater **efficiencies**, and an agile and **adaptable** organization. Capitalizing on this opportunity means investing in the investigation, translation, design and management of *work* as well as *workplace*. Our ability to link business process to the NetWork in more than superficial ways is key to demonstrating the return on that investment.

6. Key **performance indicators** for the effectiveness of NetWork are likely to include more effective collaborative work, an engaged and innovative workforce, a culture of results-based productivity, reduced environmental impacts, much higher rates of utilization of facilities and other assets, and a "just-in-time" and continuously improving delivery model for workplace.

Work today is more complex, more team-based, and more dependent on social skills as well as technical competence. Workers want greater choice and control over where, when and how they work, and technology enables this. The traditional workplace has quickly become antiquated – which, while requiring us to develop sound models for the future, also provides the opportunity to shed old ways of doing things that are inefficient and ineffective, and which lack the ability to adapt as quickly as the organization changes. By embracing what has changed and will keep evolving, and by insisting on truly linking the work of the organization to the accommodations for that work, NetWork represents the best opportunity to align and achieve the goals of the organization.

Sources and contributions

Behavioral analysis of work is based on Judith Heerwagen's past research and her project Workplace 2020 with Kevin Kampschroer of the GSA.

Analysis of work, work practice, and work-enabling platforms is based on the work of Michael Joroff, Barbara Feinberg, Chuck Kukla, and William Porter, especially in the Distributed Work research project carried out under the Cambridge MIT Institute.

Some of the ideas around collaboration and distributed intelligence are drawn from an Office of Naval Research workshop in January, 2002 in which Paul Keel and William Porter served as co-chairs.

The analysis of third and fourth places, mobility and coworking, carried out by Daniel Anderson, recognizes contributions from Bill Jacobson, Director of WorkBar Boston; Tim Rowe and Elizabeth Lo at the Cambridge Innovation Center; John Smith of Geek Offices Cambridge; and Mimi Graney of the Design Annex Somerville.

For contributions to and critiques of this project we owe thanks to Jan Johnson, Kris Yates, Kary Minehart, Laci Lower, and Amy Hill of Allsteel; to Kevin Kampschroer of the GSA; and to Keith Perske of eBusiness Strategies LLC.

Additional thanks are owed to Pattie Maes and Seth Hunter in the Fluid Interfaces group at MIT's Media Lab, and Susanne Seitinger in the Smart Cities group for their overview of current research in innovative interactive media technologies and urban space.

Appendix 1: a Primer on First, Second, Third and Fourth Places

In his 1989 book *The Great Good Place*, Ray Oldenburg discussed the various kinds of places in which we live and work in terms of three categories: "first places" (home), "second places" (workplaces) and "third places" (anyplace else.) In *NetWork, the Future Workplace*, we have used Richard Florida's phrase "fourth places" in reference to alternative places deliberately designed for work.

Here follow some thoughts on the relationships between work and these different places in light of recent, radical shifts in how and where people work.

First places: working at home

As more workers have become more mobile, the home has become increasingly used as a workplace. This has brought about significant changes in both work and the first-place environment, including increased support of flextime, greater flexibility in the location of one's residence, and increased communications supports. The benefit of reduced travel time translates into more time for individual or family activities. Working at home also reduces commuting costs and carbon emissions.

Working at home is hardly new. People have long used the home as a refuge for urgent or reflective work, setting up shop at the kitchen table or in whatever space might be free at the time. However, there is little research on what constitutes a successful home office other than the obvious – high-speed connection to the Internet, a comfortable chair, sufficient work surface, good ergonomics, adequate light and ability to work without household distractions. Little in the way of "best practices" covers the importance of other factors such as location in the house, other office supports (such as filing, storage, book shelves, etc.), the ability to control heating and cooling in the office space versus the house overall, control over outdoor noise, the presence of daylight and a nice view, etc., but these, too, can probably be somewhat interpolated from what we know about the office environment.

Similarly, a growing body of research on office settings expressing consistent concerns with distractions and difficulty in focusing on tasks may have relevance in the home office as well.

Davenport and Beck[*] argue that "understanding and managing attention is now the single most important determinant of business success." Not surprisingly, one of the key reasons why people choose to work at home is to reduce distractions, the primary source of which is other people – noise, chatter, interruptions, etc. And yet, despite all the benefits, many mobile workers report that work at home is not ideal; it is often lonesome, and it lacks the social stimulation that enhances creative thinking. Also, the home environment can have its own set of distractions that decrease productivity (like kids or deliveries or household management chores.) While frequent electronic connection to others, including "virtual water coolers," may

[*] Thomas H. Davenport and John C. Beck, *The Attention Economy, Understanding the New Currency of Business*, (Boston, MA: Harvard Business Review Press, 2002).

relieve social isolation and increase communication between members of a group, these are imperfect substitutes for face-to-face interaction. Experiencing a sense of connection to others is one of the main reasons people choose to go to the office or to other social settings such as coffee shops or libraries.

Third places: work and café culture

The appropriation of third places as alternative work settings has been a rapidly growing phenomenon. Ongoing developments in technology and culture have enabled mobility and expanded the available choice of third places as workplaces. Work can be performed nearly whenever, wherever and with whomever one chooses. The ability of the workforce to exert choice and individual preference in selecting work settings has created a new social dynamic with opportunities and challenges to second- and third-place environments. For the most part, third places like cafés have been selected by choice and adopted by mobile workers for their proximity to one's residence, the amenities and social interactions they afford, their ability to temporarily support work (with comfortable places to sit, access to Wi-Fi) or the quality of light and space.

However, necessity often dictates that places with even the most minimal affordances be used for work. These are typically transitional spaces such as airport or office waiting rooms or hotel lobbies that provide little more than a place to sit down and connect to the Internet via Wi-Fi or cellular signals. These also fit into a broad definition of third places.

Third places emerged as a viable alternative to working at home. Mobile workers are attracted to the social interaction as an antidote to the relative isolation of home. In the public realm, almost *any* places that are able to support work have been appropriated by mobile workers (e.g., outdoor plazas and parks.) For many, third places provide an opportunity to be embedded in a social environment, but without the obligation to interact with others as would be expected in an office.

However, third places are not without their limitations. Working in a café all day long has its drawbacks. The owner clearly benefits from high turnover of customers, and this attitude may be transmitted formally or informally to the clientele. Cafés do not have supports such as copy, fax and printing. Noise levels or one's proximity to one's neighbor may interfere with important phone calls. Furniture is not designed for long periods of working and may be ergonomically deficient. Other deficiencies include lack of plugs, parking or location near major transit stops.

Fourth places: designed for work

New hybrids are emerging with the express purpose of supporting work. Airport clubs were among the first of these, but other forms are springing up in greater variety than ever. Spaces with this more specific intention are what Richard Florida and others call “fourth places.”

Third and fourth places have some unique characteristics. They are populated by individuals who are engaged in activities unrelated one to another. These settings are examples of being “alone together” (see *NetWork*, p. 5) with other people. Spaces that are more specifically focused on and supportive of work may provide teleconferencing technologies that add the “virtual together” component, bringing together distributed work teams or connecting with the office “hub” for learning sessions or specialized knowledge support.

A very interesting take on the cowork concept called Jelly sprung up in 2006. These informal work gatherings convene in first, third and fourth places to create more socially networked settings for work. Jelly events were first hosted in apartments or cafés as free, socially oriented professional networking forums that gathered a wide variety of entrepreneurs and free agents in a single location. Jelly participants find the side-by-side working atmosphere engaging and creatively stimulating. People now also participate in Jelly via the Internet through sites like workatjelly.com and through Twitter feeds. By 2010 there were more than 80 Jelly locations in the U.S. and more than 60 in other countries.

The Jelly concept has helped to spur the development of this variety of new fourth places. These cowork spaces are a small but rapidly emerging subset of new work settings that are different from third places in that they are specifically created with the purpose of providing shared flexible workspaces for individuals with diverse and mobile work styles. Cowork spaces have several advantages over informal Jelly gatherings and sundry third places, because they provide dependable, equipped and readily accessible locations with secure access. This allows mobile workers flexible work times – some cowork locations are open 24/7. Many cowork spaces continue to host Jelly or similar networking and community-building events to foster communication, collaboration and the exchange of ideas.

Cowork spaces offer a productive, more predictable environment where people can work comfortably side-by-side with others engaged in like tasks. In general, clients for coworking spaces seem to prefer a dedicated work environment without the distractions of a café or the hush of a library. Both acoustic dampening and office etiquette tend to lower ambient noise compared to cafés, while encouraging conversations and social interactions.

Also, cowork spaces confer a greater sense of legitimacy and identity than cafés and other third places – a location, an address, a place to call “my office.”

These spaces provide shared supports for work, like high-speed wireless Internet, printers, copiers and scanners. They typically offer a variety of seating options that effectively support a greater variety of work styles and preferences. In some instances private lockers or storage bins

are supplied. Secluded areas are normally available for private conversations, as are small, shared rooms for conference, meetings, presentations and other group activities.

Good fourth places share a number of physical and social characteristics, including:

Flexibility. Seating is informally arranged and occupied. A variety of seating options is available, from tables to softer chairs or sofas. Wi-Fi Internet access allows people to sit where they want. Individuals can work according to their own schedules and come and go as they need to.

Entrepreneurial Individuals. Users seem mostly to be entrepreneurs or independent contractors rather than mobile employees.

Sociability. Working in these environments provides an opportunity to be near others and is seen as preferable to the relative isolation of a home office.

Connectivity. Users rely on virtual technologies and social media to maintain a large informal network of connections.

In addition to these attributes, coworking spaces typically have a common feature of **simplicity**. They can differ in this respect from the look and feel of the typical Regus physical location, which tends to be designed to simulate a corporate environment. Coworking spaces are often more minimalist in décor with an emphasis on simple, clean, uncluttered space. Design is pragmatic and focused on a straightforward approach to getting work done. Nonetheless, these spaces are not stark, but attractive, well lit and well furnished.

A common feature of successful fourth places is their geographic location in or near clusters or hubs – destinations with multiple options for eating, entertainment and other social amenities. These locations are, not surprisingly, in urban or densely populated areas readily accessible to large numbers of people via a broad range of transportation options. Because fourth places exist in this larger urban context, they can contribute to the transformation of central business districts, spurring them to diversify and support new and emerging businesses and work practices. Whether or not such businesses are deliberate parts of cities' and towns' economic development strategies, they will attract and retain creative professionals who increasingly choose to live in interesting and vibrant places.

The emergence of new business types and models including cowork, innovation centers and incubators, virtual offices, temporary employment agencies, social networking, job search, workforce training centers, etc., will continue to grow and evolve. Their purpose will likely expand to include increased social and professional networking opportunities, expanded support for different types of work, and improved support for communication and collaboration.

Second places: the office in the age of mobility

As the office continues to evolve, what should its role be, especially within the concept of NetWork? We already see the office becoming more intentionally social and interactive, with appropriate spatial and technology supports, providing settings that support enculturation, training, collaboration that requires face-to-face interaction, tacit learning, and mentoring (as we have discussed in some detail in the main body of this paper.)

Appendix 2: Creating a Typology of Work Behaviors and Setting Characteristics

Research on the changing nature of work suggests new behaviors that characterize current and emerging knowledge work patterns. This set will undoubtedly change as work continues to evolve and will need to be updated over time. Table 1 describes in more detail the setting affordances (space, physical infrastructure and technology) needed to enable these behaviors. No single place is expected to adequately support all of these behaviors.

Key knowledge-work behaviors

Presence – regardless of specific location, having one's presence or status as working known and acknowledged in some way

Availability – being at hand when needed, either face to face or electronically

Rapid meetings and gatherings – the ability to have meetings on short notice, virtually or in person

Collaboration in a variety of forms – one on one, small groups, large groups with varying needs and agendas – virtually, in person and combinations thereof – from simple coordination and progress checks to brainstorming, problem solving, or creative development

Visualization – the ability to display and manipulate concepts, data, drawings, maps, etc., to aid discussion and understanding

Confirmation – ability to know if what you have said is understood and how people are responding

Reflection – internal focus – thinking, writing, or to maintain a cognitive flow state

Knowing who knows what – building internal and external communities of practice – creating knowledge networks from social connections

Sociability – encouraging social interaction for its own sake and for building relationships and knowledge networks

Archiving – storing documents, cataloging and providing easy access

Research – access to source materials, documents, media, data – application of data-analysis tools and programs

Hospitality – making members and visitors feel welcome, comfortable and cared for in the space

Each of these behaviors can be supported in many ways. For example, reflection can be supported by having access to windows with distant views or being able to work anonymously in a quiet café or in the privacy of an enclosed room.

Supporting the full range of behaviors in appropriate ways will necessitate taking advantage of new technologies and applications, while also addressing the challenges they pose. For instance, we recognize the importance of face-to-face interaction, the need to support the nuances of social behavior, and the need to create a sense of belonging and being cared for. These same behaviors are difficult to support in an entirely virtual context.

Identifying Setting Characteristics

Setting characteristics – what we call affordances – can be purposefully selected to support and enhance specific behaviors. Not all settings in the NetWork are intended to support the full range of key behaviors identified above. The task of identifying affordances begins with an analysis of what the setting is for? What kinds of behaviors and processes does it need to support? An informal meeting area will be different from an extreme collaboration space. A drop-in work setting will be different from a project team space. The critical factor is thoughtful analysis of what behaviors are important and then designing the setting with these in mind. Good design is purposeful rather than generic. The tables on the following pages identify potential affordances of space, physical artifacts and technology needed to support the behaviors we identified above. (Some of these will be colored by an organization's culture or the design vocabulary of the space)

Table 1. Behavioral Typology and Settings Affordances

Key behaviors	Spatial attributes	Physical artifacts and supports	Technology artifacts and supports
Presence – regardless of specific location, having one's presence or status as working known and acknowledged in some way	Ability to identify who is at work and where Visual openness Acoustically permeable Sense of activity Ambient awareness	Glazing to aid views into space; light above workspace or door that signals presence Openings between spaces; e.g., screening at seated privacy height only Receptionist or person with responsibility of keeping track of who is in, out and available; reservation software may perform the same function	In office, some system of identifying people who have checked in physically and virtually Web-based technology to identify locations/availability of colleagues in the network – e.g., real-time location system (RTLS) or Microsoft Office Communicator Virtual water cooler
Availability – Being at hand when needed	Space affords ability to visually signal or audibly address each other	Ability to signal "Don't bother me" or "It's okay to bother me;" e.g., red object = not available, don't interrupt	Electronic icon to signal "busy"
Rapid meetings and gatherings – ability to have meetings on short notice, virtually or in person	Ability to identify who is at work and where, so they can join meeting In office or cowork center, space zoning for quiet and interactive activities Flexible space, furnishings and supports	Spaces to hold quick meetings without disturbing others; non-scheduled space very accessible Visualization supports to aid quick thinking (e.g., white boards and other drawing surfaces) and ability to save results for later retrieval and use Acoustic privacy if space is not enclosed Places to gather and stand comfortably (lean/perch) for short meetings	Conference phones if others need to be brought in virtually Video connections, telepresence – easy to use on the spot Wireless access Mobile internet devices (MID's) iPad, tablet, etc. Smart Surfaces

Key behaviors	Spatial attributes	Physical artifacts and supports	Technology artifacts and supports
Collaboration in a variety of forms – one on one, small groups, large groups with varying needs and agendas – from simple coordination and progress checks to brainstorming, problem solving, creative development – either virtually or in person and combinations thereof – for successful knowledge transfer and sharing	Acoustic privacy control Good in-room acoustics – surfaces or other means that reduce reverberation – especially in large rooms with greater distances between people Separation or zoning of activities, enabling some meetings in more open area Good lighting for viewing faces and materials Work settings outside office boundaries Accessibility and proximity Capacity and flexibility Safety and security "War room" for intense collaboration "Project room" or "team room" dedicated for the life of the project "Huddle room" for intermittent, brief interaction	Surfaces for drawing; writing walls Ability to work side by side Furnishings that enable easy, comfortable conversation (eye gaze, leaning, turning, chairs and tables easy to move) Surfaces for laying out materials Ambient controls (light, temperature, ventilation) Sufficient space around drawing surfaces to enable more than one person to use Seating in the round to support ability to see everyone Spaces to support social networking events	Visualization technologies – horizontal or vertical, e.g., Media Lab table, Smart Surfaces, MID's Presentation equipment, especially equipment that does not require lights to be dimmed, which reduces ability to read facial expressions Conference phones, video connections, telepresence, net meetings Ways to recognize when remote participants want to contribute – e.g., virtual hand raising during Webex Access to and ability to display data and information; secure shared access to cloud computing and data Connections to Twitter or other ways to enable remote participants to display ongoing commentary Internal blogs and other means to stay in touch with ideas and work progress
Visualization – ability to display and manipulate visually presented concepts, data, drawings, maps, etc.	Ability for groups of different sizes to see and interact with visualized materials – scalable distances and capacities to fit group size and display format	Surfaces to support visualizations – horizontal (interactive table) or vertical Furnishings that enable people to get up easily and quickly if they want to use the drawing surfaces Comfort while standing (foot rest, something to lean against)	Ability to capture notations & drawings, store and access electronically Multimedia technologies that enable visualization and sound Tech supports for creating together, virtually or when face to face (or combinations thereof)

Key behaviors	Spatial attributes	Physical artifacts and supports	Technology supports and artifacts
Reflection – internal focus – thinking, writing – maintaining cognitive flow state	Support individual preferences – from very quiet to being in a space with some activity and social presence Control over distractions as desired – reduced interruptions from people, noise, phones, e-mail, IM (ability to turn off, tune out for a period of time) Places to rest the mind ("positive distractions" for attention restoration, mental breaks) Hideaway space Anonymity and privacy	Small enclosed spaces away from the main activity areas Quiet space near windows and with interesting views (to support mental rest) Work at home – personal workspace Working in a third place – anonymity but some social buzz Ergonomic furnishings	Drawing-doodling artifacts Easy access to necessary information & documents Wireless Internet access in remote places Laptop, netbook, smart phone, etc.

Table 2. The Key Affordances of Different Work Settings

	Home	**Office**	**Third places, e.g., cafés, library**	**Fourth places, e.g., cowork center**
Social	Solitude Low level of distraction	Presence of colleagues Ability to meet face to face Staying "in the loop"	Anonymity; social energy; place to meet with colleagues; not private; opportunistic	Similar others Regular presence of others (may develop relationships)
Physical space	Workspace is close at hand Personalization of space High degree of control over ambient conditions / comfort controls (heat, light, music, clothing) Furnishings may be happenstance, not ergonomic	High-quality furnishings Storage for work items Meeting rooms Meeting supports (presentation equipment, white boards, etc.) Security systems	Ergonomic considerations often lacking No support or amenities for private meetings No security for personal items	Variety of settings for working may not address full range of needs Security systems
Support services	Food readily available Technology supports may not be as consistent as in the office	Conference phones Video conferencing High quality copying and printing Shared resources (books, docs) White boards, smart boards Technology support	Wi-Fi may not be available or free Plugs not readily available No printing, copying, etc.	Internet, copy, printing, fax Break areas and kitchens Conference phones and video conferencing may not be available
Work process	Individually based; connection to others is virtual	Electronic supports Coordinate with others Brainstorming, problem solving Rapid convening	Individually based Can work together with others, but no meeting supports	Individually based unless a work group uses the space

Appendix 3. Bibliography

Articles and Books

"Nomads at Last – A special report on mobile telecoms," *The Economist*, April 12, 2008

"The Idea Factory," *Boston Globe Magazine*, August 10, 2008

Arnold Craig Levin, "Solving the Right Problem: A Strategic Approach to Designing Today's Workplace," *Design Management Review*, Spring 2007

Ray Oldenburg, "Our Vanishing 'Third Places,'" *Planning Commissioners Journal*, Number 25, Winter 1996-97

"Mobile work force will exceed 1 billion by year's end," Boston.com, February 19, 2010 www.boston.com/business/ticker/2010/02/there_will_be_m.html

Steven Orfield, "Design Success: Occupancy Research and Building Performance," *Implications* Vol. 2 Issue 8, Informed Design, University of Minnesota www.informedesign.umn.edu/_news/sept_v02-p.pdf

Peter Coy et al., "The Disposable Worker," *Business Week*, January 7, 2010 http://www.businessweek.com/magazine/content/10_03/b4163032935448.htm?chan=magazine+channel_top+stories

Sylvia Cochran, "Going Coworking in Los Angeles: Emerging Business Trend Lets Entrepreneurs Share Coworking Space," Associated Content, April 12, 2010 http://www.associatedcontent.com/article/2881480/going_coworking_in_los_angeles.html

Gary Small and Gigi Vorgan, *iBrain: Surviving the Technological alteration of the Modern Mind*, (New York: Harper Collins, 2008).

E. Jeffery Hill et al., "Does it matter where you work?" *Journal of Vocational Behavior*, 2003, 63(2):220-241

Judith Heerwagen and Kevin Kampschroer, "The changing nature of organizations, work and workplace," *Whole Building Design Guide,* 2005

Robert Kraut, et al., "Internet paradox: a social technology that reduces social involvement and psychosocial well being," *American Psychologist*, 1998, 53(9): 1017-1031

John Chachere et al., "Can you accelerate your project using extreme collaboration: A model based analysis," Stanford University, Civil and Environmental Engineering Dept., 2003

Janet Morahan-Martin and Phyllis Schumacher, "Loneliness and social uses of the internet," *Computers in Human Behavior*, 2003, 19(6): 659-671

Robert J. Laubacher and Thomas W. Malone, "Flexible work arrangements and the 21st century worker's guilds," MIT Sloan School of Management, Initiative on Inventing the Organizations of the 21st Century, Working Paper #004, 1997

Robert P. Gephart, Jr., "Introduction to the brave new workplace: organizational behavior in the electronic age," *Journal of Organizational Behavior*, 2002, 23: 327-344, 2002

Andrew P. McAfee, "Enterprise 2.0: The dawn of emergent collaboration," *MIT Sloan Management Review*, 2006, 47(3): 21-28

Ann Davis and Eddie Blass, "The future workplace: views from the floor," *Futures*, 2007, 39:38-52

Gary M. Olson and Judith S. Olson "Distance Matters," *Human Computer Interaction*, 2000, 15:139-178

A.S. Pentland, "To signal is human," *American Scientist*, May, 2010
Donald Norman, *The Design of Everyday Things*, 1988, as quoted in Wikipedia http://en.wikipedia.org/wiki/Affordance
N. A. Streitz et al., "Situated Interaction with Ambient Information: Facilitating Awareness and Communication in Ubiquitous Work Environments," Tenth International Conference on Human-Computer Interaction, June 22-27, 2003.
W.E. Mackay, "Is Paper Safer? The Role of Paper Flight Strips in Air Traffic Control," *ACM/Transactions on Computer-Human Interaction*, Vol. 6 (4), 2000, pp. 311-340 http://dl.dropbox.com/u/12547481/PaperFlightStrips-Makay.pdf
William Porter et al., "Notes on Mackay's 'Is Paper Safer?,'" 2001, 2010 http://dl.dropbox.com/u/12547481/PaperFlightStrip-Comments.pdf
Michael Joroff et al., "Enabling Work Practice," MIT Report, 2007 http://dl.dropbox.com/u/12547481/enablingworkpractice.pdf
Larry E. Greiner, "Evolution and Revolution as Organizations Grow," *Harvard Business Review*, May-June 1998
Michael J. Reddy, "The Conduit Metaphor, a Case of Frame Conflict in our Language about Language," *Metaphors and Thought*, ed. A. Ortony, Cambridge University Press, 1993, pp. 164-201
M. Moussa et al., "Designing and Enacting Change: Penn Restructures Computing Services," *CAUSE*, 1996 http://dl.dropbox.com/u/12547481/penn-moussa-computing.pdf
Michael Joroff and William Porter, "Case Study: Singapore-MIT Alliance (SMA): Draft Notes," 2004 http://dl.dropbox.com/u/12547481/SingaporeMIT-CaseStudy.pdf
D. Sole and A. Edmondson, "Situated Knowledge and Learning in Dispersed Teams," Harvard Business School, 2002 http://dl.dropbox.com/u/12547481/Situated%20Knowledge.pdf
T. Horgen, M. Joroff, W. Porter, & D. Schön, *Excellence by Design: Transforming Workplace and Work Practice,* John Wiley, 1999
Pelle Ehn, *Work-Oriented Design of Computer Artifact* (Stockhom: Arbetslivscentrum, 1988)
J. Sapsed and A. Salter, "Postcards from the Edge: Local Communities, Global Programs, and Boundary Objects," *Organization Studies*, 2004, 25(9): 1515–1534 http://dl.dropbox.com/u/12547481/Sapsed-and-Salter.pdf
John Hagel III and John Seely Brown, "Service Grids: The missing link in web services" http://www.johnhagel.com/paper_servicegrid.pdf

Reports

Jumping the Boundaries of Corporate IT – Accenture global research on Millenials' use of technology, Accenture, copyright 2010
Franklin Becker and William Sims, *Offices That Work – Balancing Communication, Flexibility and Cost,* Cornell University International Workplace Studies Program, October 2001
Tom Webster et al., *Teledesic Broadband Center Field Study,* Center for the Built Environment, Summary Report, April 2002
Petra M. Bosch-Sijtsema et al., *Knowledge Work Productivity in Distributed Teams: A review on elements affecting productivity of knowledge work*, Helsinki University of Technology, BIT/Work Psychology and Leadership, 2009

2008 Workplace Survey – United States, Gensler Design and Performance Report, 2008
Thomas Lutzkendorf and Thorsten Speer, University Karlsruhe; Francoise Szigeti and Gerald Davis, International Center for Facilities; Pieter C. LeRoux and Akikazu Kato, Toyohashi University of Technology; Kazuhisa Tsunekawa, University of Nagoya, *A comparison of international classifications for performance requirements and building performance categories used in evaluation methods,* 2005
Alexandra M. Miller, *Fun in the Workplace: Toward an Environment-Behavior Framework Relating Office Design, Employee Creativity, and Job Satisfaction*, University of Florida, 2005
Brownlee Thomas, *It's Time to Review – And Renew – Your Telecommuting Policy*, Sourcing & Vendor Management Professionals – Forrester, April 8, 2009
Terrance L. Gargiulo, *The Top Ten Strategies For Managers of Mobile Workers: Surviving and Thriving in the Emerging Mobile Workforce*, MakingStories.net, 2010

Blogs

Justin Levy, "CoWorking and the Workshifter: Taking Workshifting to a Different Place," Workshifting, March 25, 2010, 1:24 p.m. www.workshifting.com/2010/03/coworking-and-the-workshifter-taking-workshifting-to-a-different-place.html

Kate Lister, "How Many People Actually Telecommute?" February 21, 2010, 8:13 p.m. http://www.workshifting.com/2010/02/how-many-people-actually-telecommute.html
Sarah Milstein, "How Twitter Can Help at Work," Shifting Careers, September 7, 2008 9:01 p.m. http://shiftingcareers.blogs.nytimes.com/2008/09/07/how-twitter-can-help-at-work/
Liz Kofman, "Coworking: what's the real story?" Work.Life, April 19, 2010, 12:52 p.m. http://trueslant.com/lizandastri/2010/04/19/coworking-whats-the-real-story/