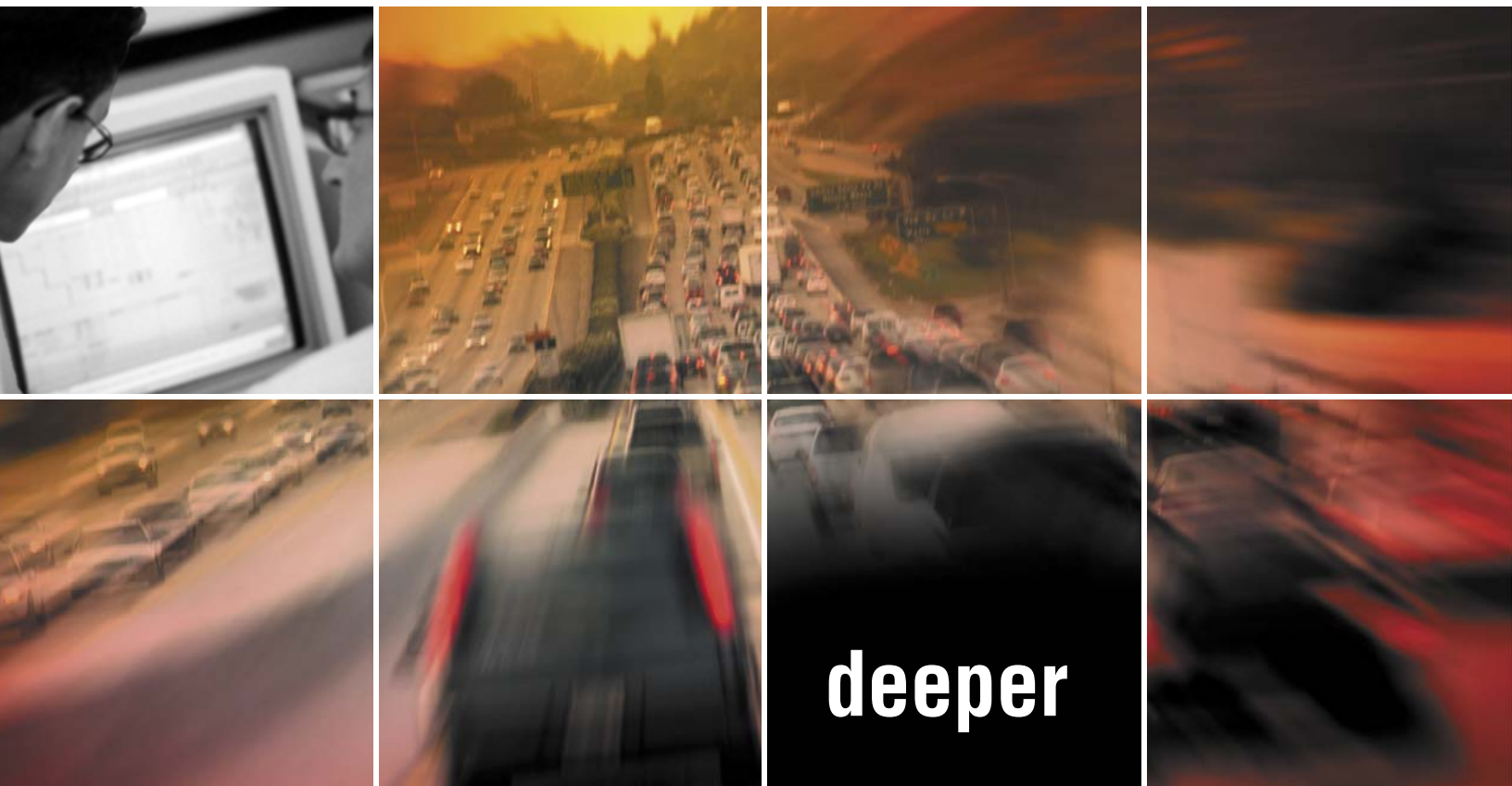# Using collaborative environments to transform your organization's business processes

An IBM Institute for Business Value executive brief

Contents

Using collaborative environments to transform your organization's business processes

In this era of global connectivity, collaborative technologies promise to play an important role in how people within organizations communicate, reach decisions and accomplish their work. Global operations, geographically-dispersed project team members and the need to rapidly share knowledge among employees will make *collaborative environments* (CEs) a critical business enabler. Yet most companies lack a formal strategy for deploying collaborative environments.

To understand how some organizations are already using CEs to improve their business processes, we studied collaborative environments in seven organizations. Based on our analysis, this paper provides a framework for understanding the impact of CEs on an organization's business processes. Our framework's underlying thesis is that *tactical* (pin-pointed) deployments of CEs create only *evolutionary* degrees of process transformation, while more *strategic* deployments have the potential for a higher level of impact and can drive *revolutionary* changes in an organization's business processes. Examples, drawn from our interviews, illustrate the framework. Further, we outline recommendations that organizations should consider when planning and implementing collaborative environments.

What is driving the use of CEs?

Today, organizations are increasingly adopting and applying *collaborative environments* (CEs) to tap into the knowledge and expertise of their employees, customers and business partners. Collaborative environments – which are constructed from a range of computer and communications technologies, such as instant messaging, e-mail, chat rooms, discussion databases, mobile communicators, shared white-boards, media spaces/cybercafes and audio, video or Web conferences – allow two or more participants to communicate, coordinate and collaborate to accomplish a shared objective. CEs are not only growing in usage as part of normal business operations, but are becoming more important as organizations move toward globally-distributed work teams and extended-enterprise partnerships.
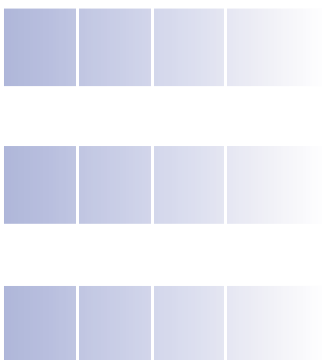
Perhaps of greater significance, the use of collaborative environments is growing in response to reduced travel budgets, international terrorism, world health epidemics such as SARS and disruptive events such as "the Great Blackout of 2003" that paralyzed over 50 million people in the eastern U.S. and Canada. At IBM, for example, even though e-mail and Internet servers were purposely taken down that afternoon (to conserve power in the greater New York area), employees were able to fall back on IBM Lotus Sametime® instant messaging technology to communicate and collaborate with their colleagues. As crippling events such as these continue to disrupt "normal" business operations, a spectrum of CEs will be essential for organizations to maintain channels of communication during times of crisis. As John Kelly and David Stark learned from their research into the preparedness and response immediately following the September 11 attacks:

"From the times the planes hit, until the restoration weeks later of stable telecommunications services and working environments, new communications technologies played an especially large role. E-mail, the Web, virtual private networks (VPNs), instant messaging, mobile communicators (like Blackberries), online chatrooms, cybercafes, and other technologies we have adopted over the last decade were essential to many of those struggling to weather the crisis." [1]

Amazingly, while the use and importance of these new communication media are skyrocketing, many companies do not have a plan in place for how their organization will drive the use of collaborative tools. For example, in a recent study of business technology executives, only 38 percent reported that they had a formal plan in place for deploying collaborative technologies.[2] For those that do have a plan and have CE initiatives underway, we found that CEs are often superimposed on top of existing business processes without consideration for how they could shorten, revamp or otherwise impact those processes. In some cases, the selection of a specific CE technology dictates often unforeseen process changes. This is surprising, given that the business process reengineering (BPR) movement of the early 1990s was built on the decree that, "Instead of embedding outdated processes in silicon and software, we should obliterate them and start over."[3]

In fact, in the early 1990s, as part of the BPR movement, a number of management gurus and academic thought leaders highlighted the pitfalls of simply automating existing processes. Two noteworthy articles published months apart in 1994 – by Teng et al. in *California Management Review*[4] and Venkatraman in *Sloan Management Review*[5] – exposed these risks and offered frameworks for using IT to not only automate but also to redefine business processes, collaboration networks and
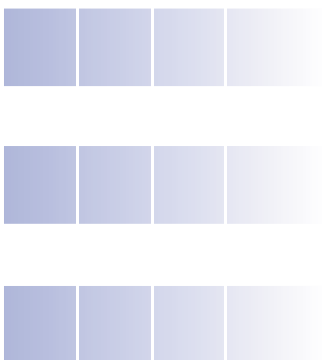
business scope. With the economic climate forcing many businesses to revisit some of these basic BPR tenets in the recent waves of restructurings, downsizings and increased outsourcing of business functions, we believe this presents an opportunity for companies to rethink how CEs can impact their businesses.

To understand how some organizations are already using CEs to improve their business processes, we studied collaborative environments in seven organizations (see Figure 1). Based on our analysis, this paper provides a framework for understanding the impact of CEs on an organization's business processes. Real-world examples, drawn from our interviews with project and process managers, illustrate the framework. Further, we outline recommendations that organizations should consider when assessing, adopting or implementing collaborative environments.

Figure 1. Organizations and collaborative environments studied.

| Organization	Business processes/ Functions analyzed	Collaborative environment	Level of CE transformation	Area of focus
FAA	Regional airway facilities, HAZMAT/disaster operations, operational evolution planners	Lotus Notes®/Domino®, IBM QuickPlace®, Lotus Sametime®	Local	Tactical
Montgomery-Watson Harza	Sales/marketing, build and design, project management	KNet (Lotus Notes/ Domino), QuickPlace, Sametime	Intra-organizational	Tactical
Internet and network solutions company	Food-borne disease detection and prevention	e-mail, ListServ, Web board	Extended-network	Strategic
U.S.-based pharmaceutical company	Alliance management, IT project management	Microsoft NetMeeting™, Centra, Lotus Notes TeamRoom, eRoom	Local	Tactical
Technology company	e-learning for manufacturing, finance/HR, CRM	eRoom, WebEx, Microsoft Sharepoint®, Vantive, Peoplesoft, NetMeeting	Intra-organizational	Strategic
European-based pharmaceutical company	Worldwide knowledge networking	Lotus Notes/Domino	Intra-organizational	Tactical
Government department	Office of electronic government, government legal services, secretary of state	Lotus Notes/Domino, Sametime (pilot)	Local	Tactical

Framework for understanding the impact of CEs on business processes

Venkatraman's "Five Levels of IT-Enabled Business Transformation Framework"[6] categorizes IT-enabled changes in business processes into five levels that increase in both range of benefits and degree of transformation to the business. Similarly, based on our interviews and analysis of CEs, we propose a model that categorizes "CE-enabled" changes in business processes into three levels. Our framework has two dimensions *(degree of business process transformation* and *area of focus)* and within this two-dimensional space we map three levels of collaboration *(local, cross-organizational* and *extended network).* Figure 2 is a graphical representation of the framework.

The degree of business process transformation

The vertical axis, *degree of business process transformation*, is a continuum from evolutionary to revolutionary. We define an evolutionary transformation as one in which there is a limited alteration to an existing process or practice. Business processes may be automated or accelerated, but there is no dramatic change to how the work is done. In a revolutionary transformation, new work activities are added or deleted or the work is shifted to elsewhere in the organization.

For example, consider a retailer that automates some of its call center operations by routing calls to a voice response system, resulting in customer self-service. Costs may be decreased by reducing human operators, but there is no radical change to the process itself, or how information regarding product problems is used within the company. A more radical change might involve constant feedback from customers, through initiatives such as Web-based customer discussion forums or communities of practice centered on a particular product theme. CE technologies, such as instant messaging, could be used for realtime interaction with the customer. But, what makes this revolutionary is how this information is used. A process could be established where this information is routinely analyzed and fed directly into the marketing and product development decision-making processes. Therefore, not only is there a potential for cost savings, but also cross-company business processes are changed.
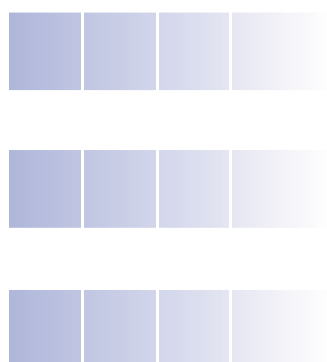
The area of focus

The framework's other dimension examines the CE's area of focus, and ranges from tactical to strategic. A tactical focus is one in which CE technologies are used to solve a specific challenge fueled by cost savings or improved efficiencies. For example, one project manager we interviewed implemented virtual meeting technology in his team of ten consultants to save travel costs and to share information more effectively among the group. A strategic focus is one in which the company leverages a CE in a critical area of its business. For example, a biotechnology company that regarded drug development as critical to its success implemented a firm-wide CE where scientists could collaborate on projects and share insights and documents on a realtime basis.

Our framework's underlying thesis is that *tactical* (pin-pointed) deployments of CEs create only *evolutionary* degrees of process transformation, while more *strategic* deployments have the potential for a higher level of impact and can drive *revolutionary* changes in an organization's business processes. Thus, if an organization leverages a CE technology to collaborate with external business partners or customers while eliminating or streamlining processes to be more flexible and responsive to changing market needs, the level of impact is far more strategic and the process transformation is more revolutionary.

Figure 2. Three levels of collaborative environment-enabled business process transformation.
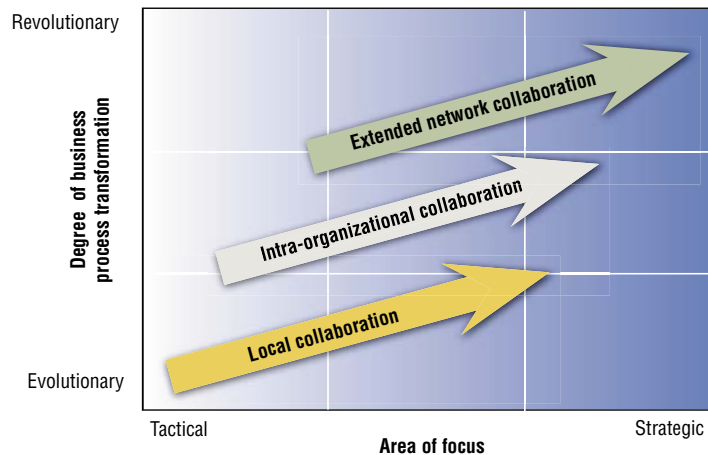
Source: Adapted from Venkatraman, N. IT-Enabled Business Transformation: From Automation to Business Scope Redefinition. Sloan Management Review. Winter 1994. pp. 73-87.
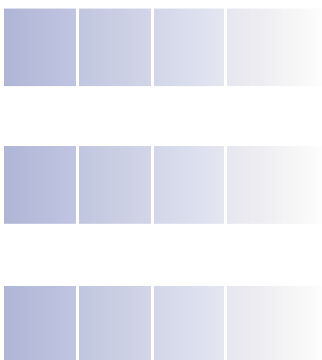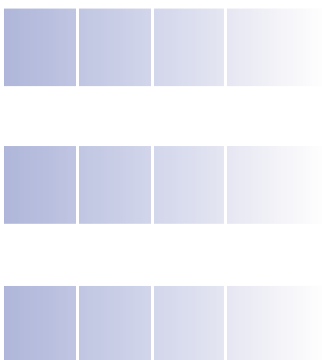
Local collaboration

In many firms, CEs are first deployed to leverage *local collaboration* to support a specific business unit's or distributed work team's processes. At this level, we viewed nominal changes to the organization's larger business processes, but did see some changes at a local level. Here, the decisions to deploy CEs are typically decentralized, the technology is purchased by the business unit or work team and the reason for deployment is tactical.

One local collaboration initiative we studied was the Federal Aviation Administration's (FAA) Southern Region Disaster Management Team. This team is responsible for keeping 1,600 airport facilities "up and running" by managing "macro" events, such as storms, terrorism, or plane crashes, and "micro" events such as mechanical malfunctions of radar equipment or birds nesting in a radio tower. On average, the team deals with twelve major storms (tropical and hurricane) each year in a region that encompasses eight states (Kentucky, Tennessee, North Carolina, South Carolina, Mississippi, Alabama, Georgia, Florida) and the Caribbean.

Given the scope of operations and the field personnel needed to handle such events, in the mid-1990's the Southern Region Disaster Management Team began to recognize that Web-based tools had the potential to improve event management. Key personnel began to lay a foundation for using tools such as QuickPlace (discussion database) and Sametime (instant messaging) to connect experts, gather documents, photos and videos, and manage schedules, resources and equipment. The Southern Region's collaborative environment officially went operational with Hurricane Floyd in 1999.

Prior to adopting CEs, each disaster team would send in sporadic updates to the regional coordinator. Since communication was handled by a barrage of open mike conference calls and fax relays, it was difficult for the coordinator to see the overall status of the mission and to reallocate resources as needed to quickly resolve problems as they arose. Likewise, seeking out needed information often required multiple phone calls to multiple sources, hampering response time. Now, disaster management teams can send in field data (which can now be in the form of voice, photos, videos, or reports) to the regional field offices, making the information readily accessible by all involved. With all event managers using the same data, rapid decision-making has dramatically improved response time while lowering the use of human resources (see Figure 3).

Figure 3: Change in FAA Southern Region's event management and collaborative processes.

FAA Southern Region's event management and collaboration process prior to Hurricane Floyd (1999)

FAA Southern Region's event management and collaboration process currently (2003)
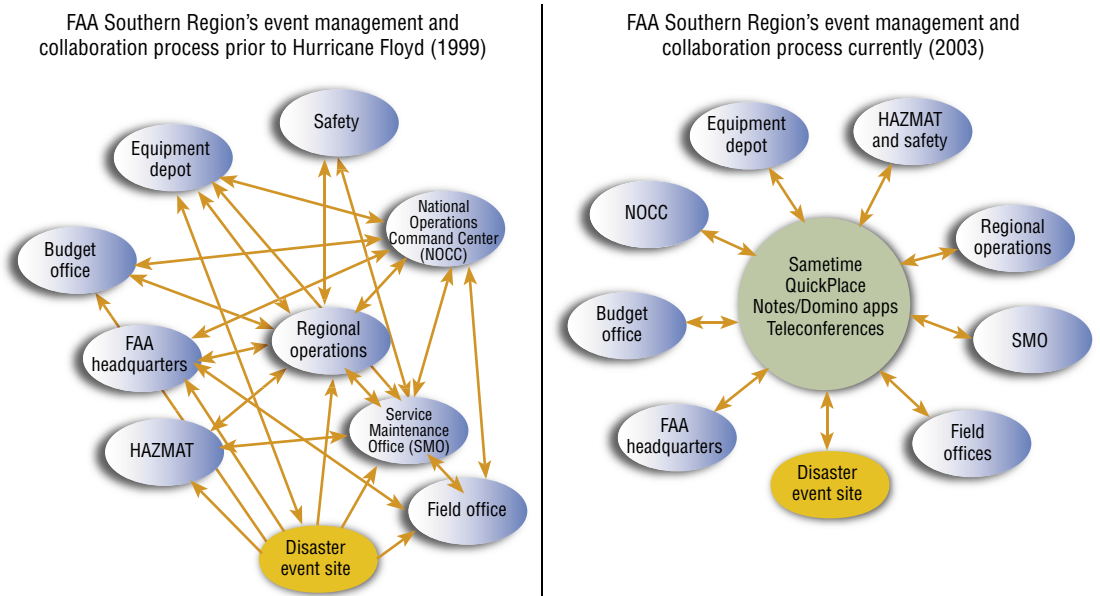
Intra-organizational collaboration

At the intra-organizational level, CEs are commonly deployed companywide and are often managed and implemented by a centralized IT group. While some systems expand from local to intra-organizational systems, in most cases the corporate IT function makes a decision to adopt a specific collaborative software technology (or set of technologies).

These intra-organizational initiatives are designed to streamline business processes on a larger scale, achieving greater efficiencies and increased productivity due, in large part, to easier access to companywide information and knowledge. More integrated cross-organizational processes allow the organization to exploit CEs to better deliver customer service or shorten project completion cycles. Also, the improved internal communication resulting from the use of new collaborative tools allows globally-dispersed teams to collaborate across time, space and distance.

This is exactly how work is being conducted at Montgomery-Watson Harza (MWH). As one of the world's top three experts on power, water and wastewater issues, MWH designs, builds, finances and manages many of the world's largest and technologically advanced distribution, drainage, flood control, wastewater treatment, water remediation and power plant projects. At MWH, design and build project teams use CEs such as NetMeeting, QuickPlace, Sametime, MWH's global portal KNet,
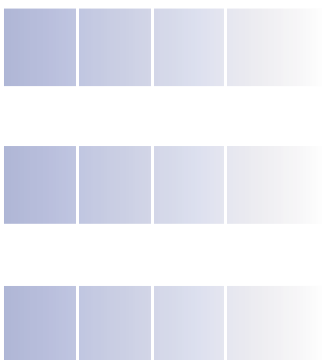
and collaboration-enhanced computer-aided design (CAD) tools to manage client work and share project knowledge. Like other cross-organization collaboration efforts, MWH rolled out these technologies on a global scale – allowing the entire company to benefit from increased collaboration and streamlined business processes.

Prior to using CEs, typical design and build projects at MWH relied on face-to-face meetings. Many design teams had to meet physically in the place where the design work was to be carried out for both key business development and project management tasks (see Figure 4). On average, project proposals were researched for weeks in one of four physical MWH project libraries. It was difficult to receive design feedback and comments in realtime, which resulted in design changes occurring "late in the game." This method not only required significant travel, but much effort to coordinate and manage projects. On average, project designs took months to complete.

**Figure 4: Change in project management at MWH as a result of CEs.**
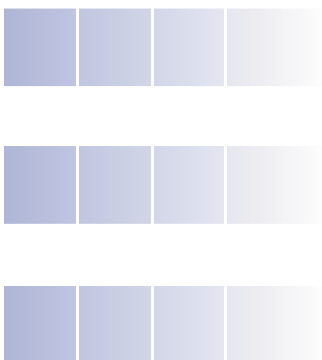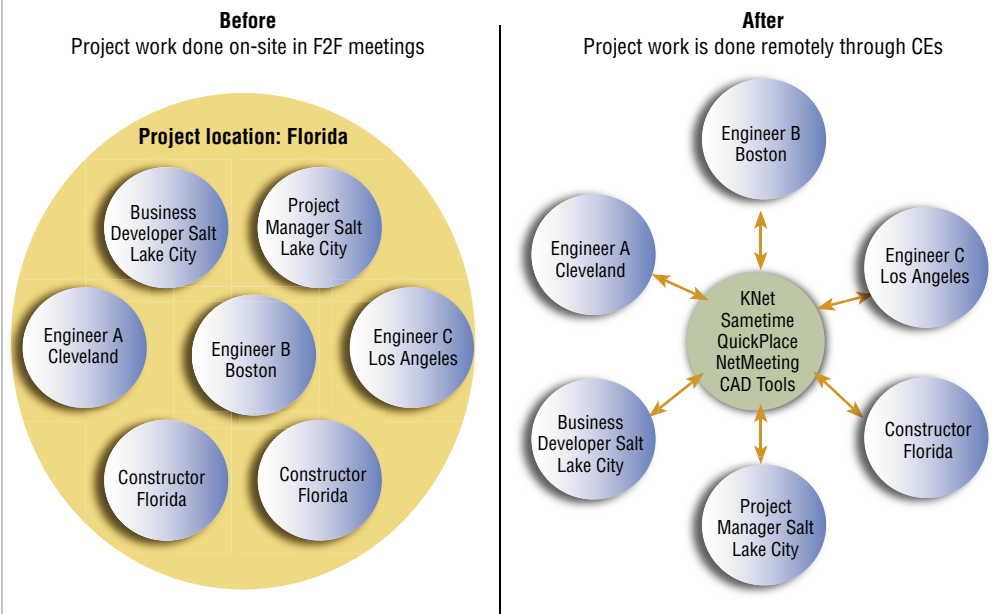
Now, using MWH's CE tools, project teams can work collaboratively, yet independently, and often from home. Design teams have the ability to review and edit 3D design models in realtime using Sametime and NetMeeting – allowing both designers and constructors to better communicate and coordinate projects. In fact, MWH reports that decision-making and design quality has improved since questions, comments and feedback on project work can be delivered realtime. Designers whom we interviewed also pointed out that since project documents (which were previously stored in physical libraries) can now be accessed through KNet, the completion of project designs has been reduced by months. Overall, exploiting intra-organizational collaboration has enabled MWH to shorten its design-to-delivery cycle and improve the quality of service to clients.

Extended network collaboration

While both the FAA and MWH have made significant local and cross-organizational improvements in business processes as a result of enhanced collaboration, they have yet to exploit collaborative environments for extended network collaboration. In the third level of our framework, organizations leverage CEs to collaborate with their extended business network of suppliers, partners and customers. At this level, organizations exploit CE functionality to coordinate and control their virtual value chain with other business partners. CEs can improve both effectiveness and efficiency by connecting partners along the value chain through the integration of a full range of processes, such as supply chain management or customer demand forecasting. By working together and frequently exchanging information, there are opportunities for mutual cost savings, process optimization and better decision-making capabilities – benefits that each partner could probably not achieve on its own. According to a recent study, companies that use collaborative technologies to enable cross-enterprise business processes and information exchange are as much as 70 percent more profitable that those who do not integrate with their trading partners.[7]

The PulseNet alliance, sponsored by the Atlanta-based Centers for Disease Control and Prevention (CDC), is a good example of the use of collaborative technologies to enable communication and information sharing among different organizations. PulseNet's participants include various U.S. federal, state and local entities whose collective purpose is the early detection and prevention of food-borne disease outbreaks. Collecting, analyzing and distributing critical information on food-borne illnesses in a timely manner is the major aim of the alliance. Communication among the state and local public health laboratories, epidemiologists and the CDC is critical to the success of PulseNet.
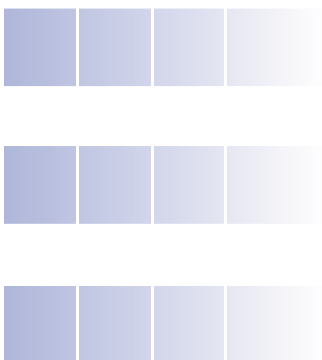
One of the major advances of PulseNet has been the application of a collaborative environment to communicate information to a large number of participants in realtime. This environment connects PulseNet participants to a national database that contains the DNA fingerprints of several types of disease pathogens. This allows state labs to determine if the DNA pattern they just produced matches anything in the database. If several labs suddenly produce matches to the same fingerprint, it could indicate an outbreak. The CE also connects PulseNet participants to each other. Realtime messages notify participants when a new pattern has been discovered. If states have discovered similar patterns, then further communication can be conducted through online, telephone or face-to-face discussions. Thirty-seven state, local and county laboratories can now post their patterns to the national database and make queries directly. Twenty additional laboratories submit their patterns through the CDC. Also, several federal labs at the United States Department of Agriculture (USDA) and United States Food and Drug Administration (FDA) are certified to post patterns.

PulseNet's use of collaborative technologies has evolved since the creation of the alliance in the mid-1990s. E-mail was the first technology used. Early in the PulseNet program, the DNA fingerprint was attached to an e-mail and sent to the small number of laboratories belonging to the network at that time. The labs would check their previous few months of data to look for a match, and respond within 48 hours. In 1997, a ListServ was created, and a Web Board followed in 2002. These enabled more realtime exchange of information and ideas. The Web Board, currently with over 300 subscribers, is used to inform others of test results, pose technical questions concerning lab tests, help solve procurement issues regarding lab equipment, exchange data files and support online discussions.

PulseNet was instrumental in detecting and investigating a 1998 outbreak of diarrheal illness in five U.S. states and two Canadian provinces. In Minnesota, local authorities were investigating three apparently unconnected outbreaks of diarrheal illness among patrons of three restaurants. They were surprised to learn that the bacteria from ill persons in the three outbreaks had the same or highly similar DNA fingerprints. Minnesota posted the information on PulseNet's ListServ and Los Angeles County replied that they too were investigating outbreaks with the same DNA fingerprints. Eventually, this led to tracing back the source to parsley that had been shipped from a single farm in Mexico. Without the use of a CE to enable realtime information sharing, these illnesses in different places in North America would not have been recognized as a common source outbreak, and therefore, would not have been traced back to the source of contamination.
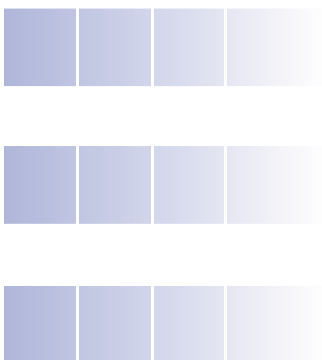
Another benefit of extended network collaboration is to build richer relationships with business partners. Through more frequent communications and realtime information exchanges, partners can move beyond transactional efficiencies to more value-added activities, such as joint product planning and idea generation. This relationship benefit is also illustrated in the PulseNet example. Prior to the PulseNet alliance, communication across state health labs with regard to food-borne disease outbreaks could be described as infrequent. Now, through the combination of yearly face-to-face meetings and communication through CE technologies, richer relationships have been formed across state boundaries. These deepened relationships among the public health laboratories and with the CDC have resulted in joint planning on the future direction of PulseNet, in addition to discussions on improving its day-to-day operations.

Recommendations for getting the most out of CEs in your organization

It is important to note that we observed considerable variation in starting points for CE initiatives in the organizations that we studied. We found examples of firms beginning their CE initiatives along the various levels of our three-tiered framework. For instance, MWH launched their CE initiative at an intra-organizational level to exploit the efficiencies gained from local (project team) collaboration and to lay the groundwork for reaching across the firewall to their extended network partners and customers.

We believe our framework is helpful for organizations to assess their CE initiatives relative to the three levels of collaboration and to understand opportunities for further leveraging CEs. To build a solid foundation for incorporating CEs into successful business process transformation in your organization, we suggest using the framework as follows:

- *Step 1:* Determine where and how CEs have impacted your organization. For example, have the benefits been mostly tactical or have strategic areas of the business been improved?

- *Step 2:* Determine the degree of business process transformation achieved or desired. For example, does your organization want to use CEs to integrate and redesign one or more business processes? Does your organization want to engage with business partners through the use of collaborative technologies?

- *Step 3:* Understand the gaps in your CE program. In other words, understand where you are now with your CE initiatives versus where you want to be.
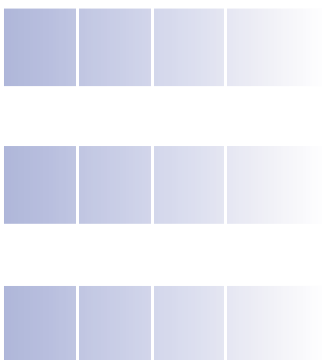
After deciding where your organization lies in our framework, consider the recommendations listed in Figure 5 as you look for opportunities for CEs to have greater strategic impact within a level or transform a business process to the next level.

Figure 5: Recommendations for using collaborative environments.

CE goal	Recommendations
Greater strategic impact	• Target strategic areas of the organization. If a CE has been successfully utilized in one local area of the business (e.g., a specific business unit or geographic location), see if you can build on this success to target strategic areas of the business. • Target company-critical technology and business applications. Analyze what CE technologies, if any, are being used by other business functions. Look for mission-critical enterprisewide applications (e.g., ERP) and see if CE technologies can be incorporated into these applications. • Look for "trigger events" and seize opportunities by building on early successes. An application of a CE, for example the use of instant messaging to solve a critical customer problem, may be a highly publicized success and as a result may cause other strategic groups to think about using CE technologies. • Publicize and market the benefits of CEs across the organization. The CIO, CKO or perhaps local IT managers should promote the benefits of CE technology. Also, get business practitioners to publicize their CE success stories. • Successfully launch and complete a CE pilot, perhaps within a local group. Look for ways to expand this CE project into more strategic areas of the organization.
Greater business transformation	• Target areas where CE technologies can help redesign business processes and models, and not just save costs and improve efficiencies. For example, if sales, marketing or product design teams had realtime information sharing sessions with customers, would this enable new ways of getting work done or enable your company to differentiate itself from its competitors? • Understand how transforming different business processes can benefit your company. Look for natural synergies across different business groups or geographies that could benefit from a CE. Streamline and harmonize differing agendas and processes to create a shared goal. For example, if engineering and manufacturing were able to communicate more successfully, would this add value? • Understand the value of collaborating with your business partners, including suppliers and customers. Identify business process that can be integrated with your partners. Identify technology platforms used by your business partners and look for ways to seamlessly integrate CE technologies. Incorporate a CE into CRM and SCM projects. Leverage a CE within existing extended enterprise programs. • Understand who is collaborating within and outside your company and what they mean by collaboration. Understand the different cultures that may exist between business divisions, geographical areas and organizations, and how CE technologies can be incorporated into this environment. • Integrate tool choices across the organization's boundaries and stovepipes. Don't forget what you have learned from other similar IT initiatives in terms of integration, training and end-user support. CE technologies, such as virtual meetings and workspaces, should eventually be perceived as easy to use as e-mail is today for most managers and practitioners.
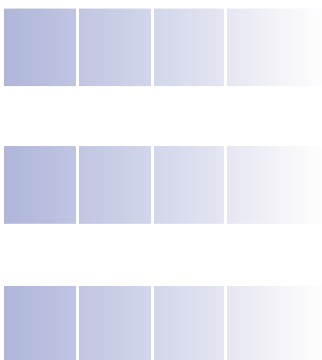
Conclusion

Collaborative technologies promise to play an important role in how people within organizations communicate, reach decisions and accomplish their work. Global operations, geographically-dispersed project team members and the need to rapidly share knowledge among employees will make collaborative environments a critical business enabler. Yet, as noted, most companies lack a strategy for adopting collaborative environments.

We have provided a framework, with examples from several organizations we studied, to gain insight into the potential impact of CEs on business processes. Collaborative environments can impact both tactical and strategic areas of the company, and support both evolutionary and revolutionary process changes that span departments, organizations and business partners. Managers should understand the implications of collaborative environments for their businesses and develop strategies to use them effectively.

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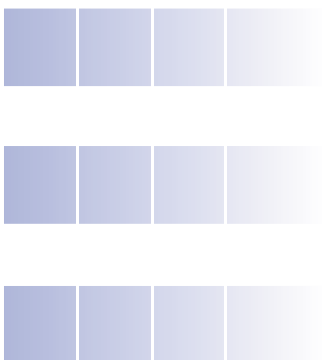
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