

## The Role of Technology in Organization Development and Change

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**The problem and the solution.** Organization development (OD) is a data-driven process for change, and as a result, the successful application of OD interventions and tools has become increasingly dependent on the use of information technology. This chapter focuses on the role of information (or data) in contemporary change efforts, and the impact that technology has had on the practice of OD over the past decade. Following a case study of a Web-enabled platform used to drive culture change, the chapter closes with a discussion of the unexpected consequences and potential issues involved with the use of technology for OD initiatives that need to be addressed.

We live in a data-driven world. Data, and therefore the technology that collects, processes, interfaces, and makes data meaningful for people, is at the very heart of society and day-to-day organizational experiences. Although many people take its impact for granted, information technology (IT) is what connects people, organizations, and social systems (Katz & Kahn, 1978). Technology drives

- organizational communications (e.g., through e-mail, Web sites, virtual meetings);
- standard human resource processes (e.g., online benefits enrollments, onboarding and orientation programs, HRIS tracking systems, performance management processes); and
- organization development (OD) efforts (e.g., targeted developmental feedback aimed at driving leadership and manager quality, self-directed learning and career management tools to support culture

change, instant online survey technology and follow-up capability, and interactive training and development initiatives).

Clearly, we have entered the information age (Church & Waclawski, 1998, 2001). As Hronec (1993) described almost a decade ago, the role of information as “vital signs” in driving and evaluating initiatives related to OD and human resource development (HRD) is indeed more significant than ever before. Although the guiding principles and general content underlying organizational change efforts today remain roughly the same as they were 40 years ago, the approach and delivery methods used to drive change are profoundly different than they were even a few short years ago. Technology has presented a new way to look at OD as a truly data-driven process (Waclawski & Church, 2002), and that technology has brought with it both significant opportunities for advancing the field (Tippins, 2002) and unforeseen challenges (Kuhnert & McCauley, 1996; McDonagh, 2001) that need to be addressed.

The purpose of this chapter is to focus on the impact of technology (primarily Internet and Web-based technologies) on the practice of OD and on change efforts in contemporary organizational settings. Following a brief overview and context setting discussion of the field of OD as a data-driven approach to change, the chapter explores several different ways in which technology can both enhance traditional (or even preexisting) OD efforts and enable entirely new approaches that previously were not possible. Given that change of any sort produces both expected and unexpected consequences, the chapter discusses some of the surprises and challenges inherent in the greater reliance on technology for OD-related efforts. The chapter closes with a brief discussion of the overall contribution of technology to support OD efforts, as well as possible new directions, and related implications, of the use of technology for the future of the field.

### **OD as a Data-Driven Approach to Change**

If there is anything that can be universally said about the field of OD it is that it has never been at peace with itself (Church, 2001c; Weidner & Kulick, 1999). Over the years, criticism has been levied at the field for lacking a fully integrated, unifying, and consistent set of theories, interventions, criteria for practice, and even a consistent set of underlying values (e.g., Burke, 1982; Church & Burke, 1995; Church, Waclawski, & Siegal, 1996; Friedlander, 1976; Goodstein, 1984; Greiner, 1980; Margulies & Raia, 1990; Porras & Robertson, 1992; Rothwell, Sullivan, & McLean, 1995; Sanzgiri & Gottlieb, 1992; Weisbord, 1982).

More recently, the one aspect that many practitioners are beginning to agree on is that OD is fundamentally a data-driven approach (Waclawski & Church, 2002). Although this notion is counter to those who entered the

field with a “softer” more “touchy-feely” mind-set, the reality is that today’s organizational environment is ruled by information. Stock price, market share, double-digit growth, net income, headcount, number of Web-site hits, and survey response rates are all based on such information. If businesses run their operations this way, why shouldn’t the OD and HRD practitioners that support them run this way? It is actually not such a big leap, at least for some.

Recent writing in the field of OD (e.g., Waclawski & Church, 2002) has begun to frame the entire spectrum of OD tools and techniques—from quantitative approaches to culture change (such as organizational surveys, multisource or 360-degree feedback, or linkage research) to more process-based approaches (such as appreciative inquiry, process consultation, interviews and focus groups, and even large systems interventions)—as being fundamentally based on data or information.

Although the field of OD has a number of diverse streams of influence—from individual psychology (Hertzberg, 1966; Maslow, 1954), social psychology (Homans, 1950; Katz & Kahn, 1978), group dynamics (Argyris, 1964; Lewin, 1951; Thibaut & Kelley, 1959), participative management (McGregor, 1960), survey methods (Likert, 1967), and even psychotherapy (Bion, 1959)—at its core, OD is the implementation of a process of planned change for the purpose of organization improvement. Using the definition offered by Waclawski and Church (2002), for the purposes of this chapter, OD is defined as “a planned process of promoting positive humanistically oriented large-system change and improvement in organizations through the use of social science theory, action research, and behaviorally-based data collection and feedback techniques” (p. 9).

Inherent in this definition are three basic notions behind all OD efforts that have to do with (a) a data-based technique known as action research (Lewin, 1947; Nadler, 1977), (b) big-picture, systems-level thinking (Burke & Litwin, 1992; Katz & Kahn, 1978), and (c) a normative- and humanistic values-based approach to leading organizational improvement (Church, Burke, & Van Eynde, 1994; Friedlander, 1976; Margulies & Raia, 1990). Although a detailed description of each of these elements is beyond the scope of this chapter (for recent reviews see Church, Waclawski, & Burke, 2001 or Waclawski & Church, 2002), the important point is that information or data regarding how employees think and feel about the present state of their organization, manager, job, career, work-life balance, and rewards and recognition, is a central component to any OD- or HRD-related initiative.

Because of this fact, technology has indeed had a fundamental impact on organizations, and the field of OD in general concerning the manner in which information is collected, analyzed, and disseminated—and ultimately acted upon. In short, technology has shifted the emphasis in many

OD initiatives from being focused on laborious and time-consuming delivery to actually seeing the culture change process happen in real time. This is clearly reflected, for example, in the recently noted shift in the role of OD practitioners engaged in organizational survey efforts (Kraut & Saari, 1999). In the 1980s, for example, practitioners were seen as being primarily survey content and process experts. This changed in the 1990s to practitioners being seen as sophisticated statistical data gurus with advanced modeling techniques. Today, many OD-based survey practitioners are viewed as truly strategic agents for organizational change and improvement (Church & Waclawski, 2001).

Similarly, in a recent survey of more than 20 internal and external well-known and respected OD practitioners (Church, Waclawski, & Berr 2002), the impact of technology was cited as one of three major emerging trends in the field, and as having a larger role in day-to-day experiences at work. Although respondents were almost evenly split in their opinions as to the magnitude of this impact (e.g., some argued that technology would have a profound effect on OD as it is known today versus others who felt that technology changes only the delivery mode for interventions but not the fundamentals of doing OD work itself), technology was seen as a key influencer for the future. Similarly, recent special issues of the *Organization Development Journal* (e.g., McDonagh & Coghlan, 2001) contained articles that focused primarily on using OD techniques to help large-scale IT efforts achieve greater success, given that current estimates of large-scale IT implementation success rates are at 50% total failure and 40% delivered late and over budget (McDonagh, 2001). A number of the same issues regarding the need to capitalize on synergies between OD and IT practitioners also were discussed. In the final analysis, technology has and will continue to dramatically change the way in which organizations work with and use information, and as a result, continue to significantly affect the field of OD.

### **The Impact of Technology on OD Practice**

Although there are several different approaches one could use to categorize the ways in which technology has affected OD practice over the past decade, the following discussion focuses on three major areas: quantitative data-based assessment tools and techniques (e.g., organizational surveys, 360-degree feedback, selection tests); management and employee development efforts (e.g., career tools, interactive training, self-paced learning); and communications, connectivity, and teamwork (e.g., virtual teaming, "hotelling" for virtual office space, and the sharing of information worldwide).

### Quantitative Data-Based Applications

First, it should come as no surprise that IT, and particularly Internet and Web-related applications, have significantly affected the way in which OD practitioners and their clients work with quantitative assessment-based tools and techniques. Although survey feedback has been a cornerstone of OD practice for years (Nadler, 1977), it has been the advent of new technology (i.e., interactive voice response [IVR] units, personal computers with removable floppy disks, and finally the Web itself) that has enabled surveys to significantly improve their overall capacity to drive organizational diagnosis, development, and change (Church & Waclawski, 2001; Kuhnert & McCauley, 1996; Macey, 1996; Summers, 2001; Tippins, 2002). Compared with older, paper-based approaches, technology has significantly improved:

- the turnaround time and therefore relevancy of any survey, feedback, or selection data that is collected;
- the breadth and depth of the target audience or population that can be assessed (assuming Internet access is not an issue, which it can be in certain types of organizations);
- the adaptive nature of the assessment tool itself (e.g., follow-up questions can be more easily and seamlessly added based on various responses to other questions, demographics, or combinations of responses); and finally,
- the advent of “pulse” survey technology that enables almost anyone to create a short survey on the Web and administer it quickly and easily.

Moreover, recent research regarding method effects has shown few systematic differences between survey data completed online versus more traditional paper or IVR methods (Church, 2001b; Stanton, 1998; Yost & Homer, 1998). Even the statistical tools themselves that are used by OD practitioners to analyze complex survey data (e.g., SPSS, SAS) have been transformed over the past decade from behemoth mainframe programs driven by an arcane coding language to easy-to-use, drag-and-drop structural equation models and menu-driven MANOVAs.

Of course, not all of these changes are seen as positive. Some practitioners have raised concerns regarding the abuse or overuse of survey methodology (Church & Waclawski, 2001; Stanton, 1998), particularly now that free or very inexpensive Internet pulse survey tools are readily available. So, although technology has provided an ability to use data-driven methods for organizational change, it is important to remember that (a) expertise is required throughout the entire survey process and particularly in the item

design and analyses stages, and (b) it is the actions taken and the changes made in the organization based on the information gathered that truly make the difference. That component of OD practice will always remain constant (Church & Wacławski, 2001).

### **Employee and Management Development**

The second area in which technology has affected the field concerns the use of management and employee development efforts. Although individual and organizational learning will always occur through multiple mediums (Marsick, O'Neil, & Watkins, 2002; Mohrman & Mohrman, 1993; Senge, 1990), and it is unlikely that classroom lectures, laminated cards, binders, or interactive group experiences will ever go away completely, the role of technology in management and employee development has increased significantly over the past decade. The use of technology has enabled many new approaches and applications to individual development. Some of these include (a) providing online career management tools; (b) internal and external job posting worldwide (perhaps with various functional competency models or even self-assessments against those competencies required for a given job); (c) interactive training and work simulations online that adapt to the end user's individual characteristics; and (d) sophisticated software programs that help practitioners design learning objectives, link content to objectives, and develop mastery tests (Tippins, 2002).

Once again, the benefits of technology in these types of OD applications revolve around speed, flexibility, and reach (one well-designed Website tool potentially can be used by thousands, and even hundreds of thousands, of employees). The disadvantages here are also similar: issues of access; hardware and software compatibility; technical support; costs associated with product development, customization, and maintenance; and finally, user friendliness and user training. All of these factors can have a deleterious impact on the use of the tools that have been created. These themes will be revisited again later in this chapter.

### **Communications, Teamwork, and Connectivity**

The final area of OD practice that has been affected significantly by technology is the realm of communications, teamwork, and organizational connectivity. Although some practitioners might not consider communications to be part of the application of OD, and in some aspects this might be true, culture and culture change most certainly are central to OD efforts. Clearly, communications play a key role in this regard (Church & Wacławski, 2001).

Communicating what needs to change and why is an integral part of the “unfreezing” process (Beckhard & Harris, 1987; Lewin, 1947) that is at the very heart of the OD action research model. Similarly, communicating what has changed and what is important to an organization (e.g., through rewards, various descriptions of the culture, internal and external employer branding material, formal leadership models or strategic frameworks, the nature of the questions asked on a survey, etc.) are part and parcel of any large-scale OD intervention.

Between corporate Web sites, e-mails, and various other forms of electronic communications (e.g., online newsletters, chat rooms, shared meeting and presentation virtual spaces), IT has literally transformed how employees and managers communicate and work together in teams in contemporary organizations. New forms of flexible work arrangements, “hotelling” for virtual office space, and complex organizational structures that emerged over the past decade (Church, 2001a; Coover, 1995; Howard, 1995; Nadler & Gerstein, 1992), are partly responsible for a greater reliance on technology. The trend toward increasingly global organizations and the competencies needed by managers to be successful in these different cultural environments (Hofstede, 1980; Rhinesmith, 1993), also has driven organizations to focus more on electronic forms of communicating and connecting with their employees. Although it is unlikely that formal structures (e.g., headquarter buildings) will ever cease to exist as was suggested by some during the height of the e-business boom, more coworkers and team members from across the world are working together through shared electronic and Web-based applications. The role of OD practitioners in these cases is to ensure that (a) the right messages are being communicated, (b) IT and OD experts can connect with each other to ensure alignment on the design and process elements, and (c) employees still have enough significant face-to-face interaction to ensure that they are not depersonalized and disconnected from the larger organization (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1985; McDonagh & Coghlan, 1999; Tippins, 2002).

### **Technological Applications of OD**

Clearly, the importance and potential impact of technology on the practice of OD cannot be denied. This section presents an applied case example, based on recent OD initiatives, undertaken in a large (140,000 employees) and well-known global consumer-products organization that uses technology to drive the culture change effort. The case briefly covers the prior state, the need for change, the role of technology in enhancing or enabling that change, and the outcomes or impact of the approach used.

### **Case Study: Using Web-Based Career Tools to Drive Culture Change**

In this age of technology, it only makes sense to take advantage of the advances made in this arena in recent years, especially for a global company operating under a complex business model. Although PepsiCo has historically been known for its innovation and cutting-edge ideas in providing employee and leadership development (Alziari, 2001; Church, 2002; Tichy & DeRose, 1996), with the continued growth and success of the business, the company found itself facing an increasing challenge in disseminating the tools and career management-related resources to the geographically dispersed workforce.

Although the basic content itself existed in the form of various functional competency models, training and development programs, and core HR- and OD-related processes (e.g., performance management process, 360-degree feedback, organizational health surveys, and succession and career planning tools), PepsiCo lacked the platform to integrate all of these resources. The company needed a way that made the linkages among them crystal clear to employees and managers, transparent in their application, and easily accessible to all in a central source. PepsiCo also was challenged with helping employees understand that the organization and management development processes were not discrete events occurring at specific times during the year but were rather representative of an integrated approach to driving business results through the development and growth of its employees. With all of the information bombarding line managers on a day-to-day basis, it was becoming increasingly difficult to communicate key messages or introduce new resources and tools through traditional means (e.g., hard copy brochures and email notifications). For example, functional competency models had been created for all major functions; however, the process for collecting organization-wide data on proficiency and competency gaps was cumbersome. It required paper-and-pencil assessments to be completed by all incumbents within each function. The data were subsequently hand-keyed into a spreadsheet for further analysis. This process, when multiplied across a large employee base, became a tedious, overly time-consuming task. Clearly, an HR “one-stop-shop” to maximize visibility, impact, integration, and accessibility was needed.

In addition to the need to pull all of these elements together for employees, PepsiCo also wanted to launch a new platform that would capture, enhance, and better communicate its new cultural philosophy on career development. Over the past few years, the company had been heavily emphasizing the need for employees to gain key experiences to contribute to their development (Alziari, 2001). PepsiCo had also been putting tools in place that provide more guidance to employees on what their role is in managing their own career, including how to have a career development discus-

sion with their manager. In the spirit of building a culture of open communication, both between managers and employees as well as across divisions, a new platform to house the tools, which form the basis for career discussions as well as the sharing of resources cross-divisionally, was needed.

The first step in this change effort was to communicate to employees and managers “the rules of the road” for career development through a series of employee workshops. As with any training intervention, HR was concerned with sustaining the change once it had been initiated. A combination of external benchmarking, employee opinion survey, and internal task-force data led to the concept of the MyDevelopNet Web site (i.e., the “HR One-Stop-Shop”). In this case, technology was used to provide the integrating platform by which the core HR processes, developmental resources, and career philosophy were communicated, sustained, linked, and made visible. In short, Web technology was used to drive the culture change process. The Web site reinforced the workshop training and key messages by allowing employees to answer four key questions as they relate to their own career development (see Figure 1):

1. My Competencies: Where am I now?
2. My Career: Where do I want to go?
3. My Development: How do I get there?
4. Our Discussion: Who do I talk to?

Each question (or tab on the Web site) has its own focus and set of accompanying tools for employees. The My Competencies section allows employees to assess their current level of proficiency against a number of different functional and leadership competency models. It provides an instant assessment of their skill level against a given position’s standard and invites their manager, via e-mail, to provide input as well. By using this process, managers and employees will have the data they need to engage in a more meaningful development discussion about future roles and developmental opportunities.

The My Career section offers a variety of career assessment tools, access to the internal online job posting board (aptly named MyCareerConnection), executive career biographies, and a career newsletter to help employees explore possible “best-fit” career paths (see Figure 2). All of these resources together give employees an objective, realistic preview of the roles to which they can aspire.

The My Development section houses the learning management system, which puts a host of capability building and development resources at employees’ fingertips. Once competency assessments have been completed and gaps identified, employees can choose resources targeted at closing their gaps, which are then automatically imported into their online development plan. The learning resources catalog contains internal and external training and development resources, as well as books, audiotapes, and on-the-job tips.

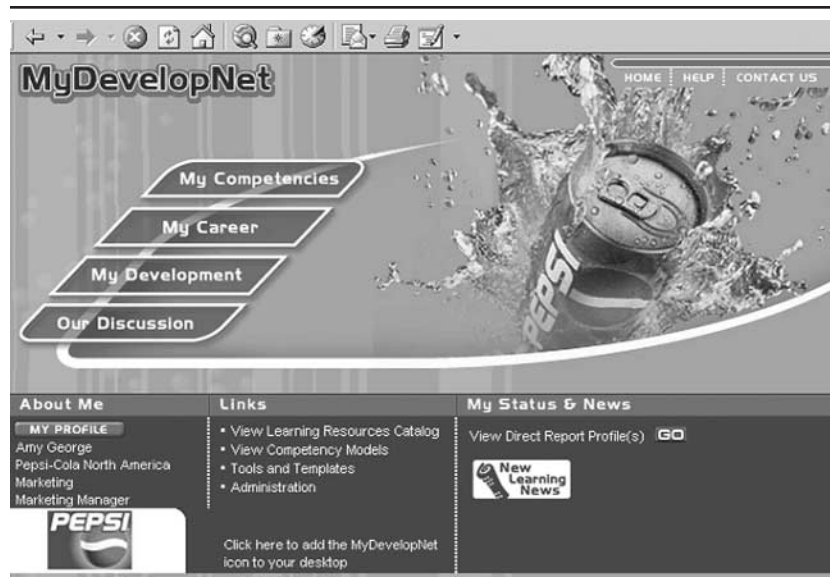
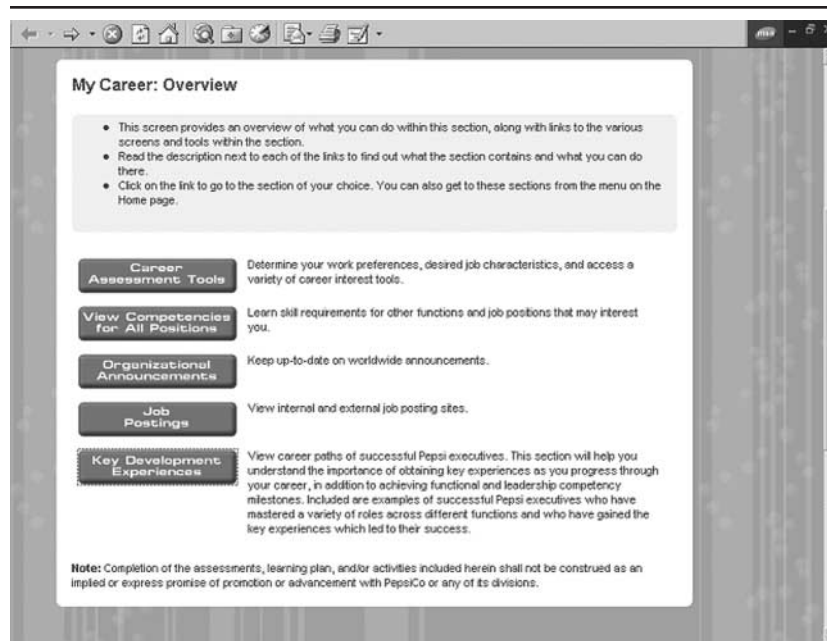


FIGURE 1: Screenshot of MyDevelopNet Web Site

The last section, Our Discussion, is the place where managers and employees come to prepare for their career development and performance management discussions. This section houses reinforcement materials from the career development and coaching training workshops, as well as information about the performance management process.

The launch in early 2002 of MyDevelopNet has created a “buzz” and excitement among employees who now recognize the level of importance that PepsiCo has placed on individual growth and development, merely by investing the financial resources to build this site. Because the organization is so geographically dispersed, employees can now access opportunities and possibilities across PepsiCo’s family of companies that were not easily accessible before. This system represents the transparency that they had been asking for regarding how to build a successful career at PepsiCo, what new jobs are available and when, and the specific competencies and levels of proficiencies needed for taking on these new roles. In addition to using this technology to drive home PepsiCo’s career philosophy and reinforce the enhanced cultural emphasis on development, the site also has proven very useful for the internal HR and OD staff as well. Efficiency has been improved dramatically in terms of the ability to monitor development plan completion, training course attendance, and registration. All of these processes were previously handled manually, requiring an inordinate amount of time and effort. By leveraging this technology, the HR and OD staff is now



**FIGURE 2: Screenshot of My Career Section**

able to query reports that will provide facts and figures in minutes. Although the initial development work associated with building this type of employee Web site (i.e., a career development portal) is not to be minimized, the benefits to the organization as a whole and to the development of the employee population make this a wise investment. MyDevelopNet will help to maintain PepsiCo's status as a world-class, people-development company, and enable the organization to continue to attract, develop, and retain the very best talent.

### **Unintended Consequences of Technology in OD Change Initiatives**

Although technology certainly can have a positive impact on OD efforts, as organizations increase their reliance on technology for these applications, the potential for unintended consequences also increases. Some of these issues may include concerns such as decreased employee participation rates, threats to adequate representation, lack of faith in the system, heightened concerns about confidentiality, and the inevitable technological glitches. If not managed carefully, these consequences can seriously threaten the quality and validity of any data or information collected, the

integrity of an entire process, and ultimately, the value of the overall organization development and change effort. The following section explores in more detail some of these potential consequences of using technology and the impact these may have on OD work.

### **Decreased Participation or Lack of Adequate Representation**

For an OD process to be effective, participation from the key stakeholders, including those employees targeted as part of that change, is an absolute requirement (Burke, 1982). In some cases, participation from a cross section of the organization may be required, for example, when sampling for an organizational survey or action planning regarding the results (Church & Wacławski, 2001; Kraut & Saari, 1999). More participation may be necessary with other types of interventions such as when soliciting behavioral feedback as part of a multisource (360-degree) feedback or any type of job-related feedback process (Bracken, Timmreck, & Church, 2001; Church, Walker, & Brockner, 2002; London, 1997). Unfortunately, employees who experience feelings of isolation or disconnection with an organization are far less likely to participate in these types of initial assessment interventions or the action planning and changes that follow. Technology can be a major barrier in this regard. Some employees (e.g., older workers) may feel isolated because they lack the experience (e.g., using computers, accessing the Internet, or using a password to log on to a Web site) to give them the confidence to participate. They may even be embarrassed or frustrated and as a result quietly slip out of the process entirely. Others may have the skills but are removed (e.g., due to flexible working conditions or international travel) and cannot access the proper resources. Still others may have little or no contact with their internal OD resources, lack the discipline to participate on their own (Tippins, 2002), or even fail to see the value in the intervention and therefore choose to be disconnected.

Another threat to connectivity and participation is the limited access to technology. Often, time and resources will go into designing a great technological solution to an assessment process or a developmental resource (e.g., a flashy new Web site) and building the core content, only to discover that a large group of employees cannot even access the site to take advantage of the process. Access may be limited simply because employees do not work with computers in their daily routines and therefore do not have them at their disposal (e.g., employees in a plant, technicians making service calls, sales people on routes). Or, access may be an issue because they work in locations where there are only a few computers to be shared by many people (e.g., frontline employees in a manufacturing facility). In addition, employees

who travel constantly (e.g., sales people) and those who spend little time in front of their computers (e.g., executives) can have difficulty finding the time to access their computers for these types of change initiatives. Access problems tend to grow when OD initiatives go deeper into the organization and away from the typical office worker at a desk with a computer. Access problems also grow as organizations get larger and more geographically dispersed and their computers and network systems are less consistent and compatible (Kuhnert & McCauley, 1996; Summers, 2001).

Regardless of the source, decreased participation in either a data-based assessment process, a Web-based career management tool, or any OD-related initiative can be a significant threat to the validity and potential impact of the entire change initiative. Data obtained may be misleading or the perspectives of certain groups of people may be overlooked (e.g., older workers, frontline employees). In addition, change initiatives that are available only to employees who have access to technology may create a development gap between those with access and those without (e.g., similar to the "Digital Divide" concept articulated to explain how people with access to technology and the Internet are learning at an accelerated rate whereas those without access fall farther behind).

One solution is to find alternative ways of delivering the technology (allowing certain company Internet sites to be accessed from home, making materials available on CDs for employees without online access and on floppy disks for those without CD-ROM machines). Kiosks might be another way of providing additional computers to locations, or if possible, making the technology available through IVR phone lines as described earlier in this chapter. Feelings of isolation also can be addressed by using more frequent communication and more face-to-face contact with OD and HR practitioners. Each situation will require a unique solution, and certainly there is not a one-size-fits-all way to leverage technology so that everyone has equal access and feels connected.

### **Lack of Faith in the System and Confidentiality**

As one might expect, employees' perceptions of a given effort or initiative can have a significant impact on its subsequent success. If a change initiative involves employees providing input into some system (e.g., responses to a survey, ratings for a 360-degree feedback process, answers to test questions, self-entering career assessment aspirations), then the issue of how the data will be tracked and used becomes very germane. Most employees realize that technology gives employers the ability to track a variety of information (Tippins, 2002), including in some cases information on who responded to which questions and how they responded. Although nearly

every organization says that this type of data is confidential, it is the responsibility of the internal and external OD practitioners to decide: (a) how the data will be used, (b) clearly communicate this to employees before they participate, and (c) ensure that confidentiality (if promised) is maintained. With expensive management gurus being labeled as “hacks” (Micklethwait & Wooldridge, 1996), and Dilbert cartoons (Adams, 1996) reinforcing cynicism of HR- and OD-related processes (Church, 1998; Shapiro, 1997), employees have become increasingly wary of all organizational change efforts. It should come as no surprise that if employees feel that their employer is not trustworthy or that they are unnecessarily watching over them (i.e., Big Brother), they will be less likely to respond truthfully or to participate in a change effort at all.

Issues with confidentiality should first be addressed during the design phase of an OD initiative. Practitioners should consider the identifying data they plan to collect and whether it is truly needed. Practitioners also should work with their IT experts to remove any technology “footprints” that can be used to track responses, and to limit the number of people who have access to the data. Once this is accomplished, the organization should work to establish a history of confidentiality with this type of information and constantly reinforce these messages in the actions and communications related to the process. It is this perception of trust in the organization that affects the validity of the data gathered (Kuhnert & McCauley, 1996), and one mistake or security breach can damage the reputation of all technology-driven change initiatives for years to come.

### **Technical Glitches**

Technical problems come in a variety of forms, and they can be extremely challenging for OD practitioners and employees. Technical glitches may cause users to become frustrated and withdraw from the process, or users may question the integrity of the system itself. Actual data quality also may be affected if some users assume their data has been transferred to the designated site, when in fact a glitch prevented it. The tendency for technological glitches to appear to be nonsystematic can make them difficult to identify and resolve. Some glitches are side effects, such as a corporate Internet firewall that prevents access to an external career or survey Web site, whereas other glitches can result when users have older or incompatible versions of software on their machines. This can cause delays in data transfer, limit certain data from being transmitted, or prevent transfer altogether. Data transfer also can be affected by the quality of connections between systems (e.g., limited bandwidth) or when a system on one end of the connection does not process data as quickly (e.g., a slower CPU) as the system on

the other end. Finally, computer viruses and server crashes also can affect the quality of data transfer and employee perceptions.

A variety of solutions may be needed for dealing with technological glitches, from working with the organization's internal IT group, to avoiding the firewall completely, to designing systems that are compatible with multiple software packages (e.g., Internet Explorer and Netscape Navigator), to limiting the size of information (e.g., graphics, logos) being transferred over connections. In some cases (e.g., server crashes, viruses), the best solution is to design redundant systems and require programs to save the data frequently to limit the data that could be lost (Macey, 1996).

## Conclusion

Although IT has and will continue to have a profound impact on the practice of organization development and change initiatives both today and in the future, there are some significant issues that need to be addressed. It has been shown that much of the success of using technology to facilitate organizational change depends on the characteristics of the organization itself. Organizations with employees who are comfortable with technology and have access to systems will undoubtedly have more success delivering technology-driven change. In contrast, organizations that have significant numbers of employees who cannot access technology (either because they do not have access, they do not know how, or they do not want to) clearly will have more difficulty. Decisions regarding how technology should enable or even drive OD-related initiatives and when technology is the appropriate medium for delivery need to be carefully considered to ensure their success. If these issues are not properly managed, the results may be reduced participation, inadequate representation, inadequate trust in the system, and eventually corruption of the process and data validity and integrity.

Clearly, the skills and competencies of OD practitioners implementing such efforts also play a critical role in their success. It is critical that OD professionals are given the appropriate training in IT and technology-related areas to be able to fully understand the implications involved in their implementation and to help apply and communicate to others the importance of this direction for the future of the field (Church, Waclawski, & Berr, 2002; McDonagh & Coghlan, 1999). This is one of many reasons why various practitioners over the past few years have called for change in the very fundamentals of how they train, legitimize, and professionalize OD practitioners as certified for practice (Church, 2001c; Gottlieb, 1998; Waclawski & Church, 2002; Weidner & Kulick, 1999). Although the contribution of technology to OD efforts is clearly evident, the opportunities to ensure that these new methodologies and applications are applied in an appropriate and professional manner may well be the next major hurdle for the field.

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