

## Chapter 2

# What's New? The Challenges of Emerging Information Technologies

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Fifty years have passed since the introduction of the digital computer. During that time, information technology has evolved beyond belief. Continued evolution seems highly likely. New information technologies—new hardware, software, and data management tools—have offered and will continue to offer great opportunities to organizations that choose to implement them. In fact, the failure to implement them will likely create disadvantages for other organizations.

However, along with the opportunities of new information technologies come the challenges. These challenges are many and diverse. Perhaps, IT professionals have not done a very good job of managing these challenges. In fact, until recently IT researchers have not recognized them.

What are these challenges of emerging information technologies? That is, what makes applying and managing them arduous and problematic when they are initially introduced? Here are some examples of these challenges.

First and foremost, IT specialists—database administrators, tech support specialists, systems analysts, programmers, and project managers—simply are not familiar with them. This is because the technologies are new and unused, and thus, the technical experts have yet to learn to use them well. Moreover, they have not seen the flaws in the technologies. They do not know the little quirks and necessary tricks that are not well documented, but are still absolutely essential to making them perform correctly.

Often, in their early releases, new information technologies do not perform as expected. They may abort unexpectedly. They may run too slowly. Some may even produce

incorrect results.

Perhaps their failure to meet expectations is a result of the competition among vendors to deliver new information technology quickly. However in their rush, the vendors do so prematurely. Perhaps vendors market new information technology before debugging thoroughly. Perhaps they rely too heavily on their initial users to find the errors and performance problems. Finding these problems will enable the vendors to develop the stable versions that ultimately become popular, but discovering them will be problematic for the users who do so.

On the other hand, maybe the failure of new information technologies to perform as expected results from the exaggerated promises of their vendors. Competitive forces may drive vendors to make claims that cannot always be met.

Moreover, when the new information technology does not perform as expected, large numbers of customers may be affected. These customers may seek help almost simultaneously, but the vendors may not be able to support them all. Thus vendor neglect can be one of the challenges of emerging information technology.

Even when developing new applications with sufficient vendor support, an organization may face its own support shortage. It needs more hours from IT professionals. It may also need more of these professionals, and it likely needs them with the skills in the new information technology. That means either the education of current IT professionals or the hiring of new ones. Of course, the skills may not exist yet because the information technologies are so new.

In addition to the need to spend more hours or employ more IT professionals with new skills, the acquisition of one information technology may produce the unexpected need to acquire another one. For example, perhaps a new program runs with the prescribed main memory requirement but does so slowly; more memory is really needed. Perhaps a database management system requires more storage space than was expected. Such cascading needs can be unanticipated and costly.

In addition to needing more IT professionals to manage new information technologies and to apply the technologies to develop new applications, the organization may also need them to integrate the new information technologies with existing ones. This integration process—with any number of possible existing information technologies—can be a challenge all its own.

Many IT professionals might find the use of the new information technologies attractive. They might see it as providing them opportunities for advancement or mobility. However, other IT professionals might resent the new information technologies. They may prefer not to be forced to learn them, but instead to continue using whatever has worked well in the past for them.

Even in organizations where all IT professionals accept emerging information technology, the decision to acquire a new product and the choice of the particular product may be difficult. An organization may be torn between buying too early (and risking the problems of an unstable product) and waiting until the product is stable (and risking that competitors will gain an edge by acquiring it).

Finally, as organizations acquire more and more new information technologies, they create a labyrinth of what will become old information technologies to support. Will they have the necessary skills in the future to maintain this variety of new products?

Thus, it is evident that the challenges of implementing new information technologies are great. The failure to meet the challenges is eventually played out in three ways. First, projects cost more than their budgets. Second, they are completed after their target dates. Third, their quality is not as high as had they understood the new information technologies

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