Speaker 1: Welcome to the MIT CISR Research Briefing series. The center for information systems research is based at the Sloan School of Management at MIT. We study digital transformation.

Stephanie Woerner: Hi, I’m Stephanie Woerner, principal research scientist and director of MIT CISR. Today I’m pleased to share with you a research briefing from the archives—a briefing from July 2004 authored by Jeanne Ross:

Maturity Matters: How Firms Generate Value from Enterprise Architecture

In order to better serve their customers and to cut operating costs, firms are instituting enterprise-wide efforts to leverage synergies and reap economies of scale. Initiatives such as “One State Street,” “One DuPont,” and JPMorgan Chase’s “one firm—one team” place IT in the role of strategic enabler. CISR research indicates, however, that firms can’t just decide to use IT strategically, write a slogan, and then reap the rewards. Rather they must learn how to make IT a strategic competency.

A firm’s learning about the strategic role of IT can be represented in four stages of enterprise architecture maturity. A firm’s enterprise architecture is the organizing logic for business processes and IT infrastructure, reflecting the integration and standardization requirements of the firm’s operating model.

In a recent survey of 103 firms, we acquired specific data on investment patterns and management practices associated with the four stages of architecture maturity. In this study, firms achieving greater architectural maturity reported lower IT costs, shorter IT development times, greater discipline in their business processes, and more strategic benefits from IT (such as customer intimacy, product leadership, and strategic agility). In this briefing we describe how firms capture and formalize the learning from each architectural stage so that they can benefit from the current stage and, if appropriate, migrate toward later stages.

IT Investment Patterns

As firms learn to apply IT more strategically, they evolve their IT investment patterns. For example, firms in the first of the four stages—Business Silos—invest heavily in local applications. In some cases this investment pattern represents a strategic choice. Holding companies, for example, may choose to be stage 1 firms. Most companies, however, have been (or still are) in stage 1 by virtue of historical investment patterns that focused on business cases addressing local business needs.

Firms shift their investments away from local applications and into shared resources as they move through the second and third stages. In the second stage—Standardized Technology—firms are developing shared infrastructure services. Firms like State Street and Carlson migrated to this stage in an attempt to generate cost savings through technology standardization and consolidation.

By the third stage—Optimized Core—firms are sharing data and standardizing business processes. Firms like Air Products and MeadWestvaco moved into this stage through an investment in an ERP, while Delta Air Lines focused on developing shared data to enhance customer service and airline operations.

Finally, in the fourth stage—Business Modularity—firms’ investment patterns are focused on smaller, reusable application and process components to support a more modular operating model. Firms like ING Direct and Marriott create standard business application modules that can be used by any of their business units. Firms apply reusable application modules in new business units or purchase modules from vendors.

In addition to the variation in investment patterns, we found that IT spending levels varied from stage to stage. IT budgets in the first stage are high because firms have limited opportunities for enterprise-wide purchase agreements, sharing of technical expertise, and consolidation of data centers. Not surprisingly, IT spending decreases as firms introduce first hardware and then software, process, and data standards. Late in the third stage the IT spending pattern appears to reverse itself. By stage 4, firms in our study were spending more on IT than stage 1 firms. While this finding may discourage firms from moving into later stages of architecture maturity, it is important to recognize that firms are gaining greater strategic benefits from IT and thus will find it easier to justify IT expenditures. In addition, we don’t know if the experiences of early adopters will prove representative of the experiences of all firms.

IT Governance and Management Patterns

As firms’ investment patterns change, they also start to generate different kinds of value. But getting value from IT demands far more than investment in building out the technical requirements of the architecture. We have learned that when IT units build enabling IT capabilities, firms may—or may not—drive value from them. Managers must introduce new management practices to formalize organizational learning about how to manage IT investments and generate IT value. They will not achieve increased value from simply changing investment patterns.

Management Practices Key to Stage 1

In our study respondents rated the value they received from a set of IT management practices, and we determined statistically which practices generated greater value as architecture matured. For example, in stage 1, key practices supporting firms’ efforts to generate value from application silos were well-designed business cases and a standardized project methodology.

These two practices encapsulate the requirements for generating value from local applications. They can help firms generate value at any stage, but firms that acquire the learning associated with these practices at an early stage are better positioned to generate value from subsequent IT investments.

Management Practices Key to Stage 2

Practices that were associated with greater IT value in stage 2 included three mechanisms facilitating more centralized IT funding: an IT steering committee, an infrastructure renewal process, and centralized funding of enterprise applications.

These funding initiatives help firms support enterprise-wide initiatives and are important to the migration from stage 1—where firms think about optimizing local business needs—to stage 2, where firms focus on maximizing the benefits of standardized technologies across the firm. The other three mechanisms of particular value in stage 2 are all related to managing a standardized technology environment: architects on project teams, an architecture exception process and a formal architecture compliance process, and a centralized standards team.

Together, the seven practices important to stage 2 reflect the growing need for IT governance to address the challenges of using IT as an enterprise-wide asset, rather than as a business unit or functional asset.

Management Practices Key to Stage 3

Following on technology standardization in stage 2, key management practices in the third stage help firms adjust to process integration and standardization. While technology standardization has its challenges, process standardization will surely confound and irritate business unit leaders. Practices emerging as important in stage 3 emphasize the increased role of senior management in setting direction and defining enterprise-wide processes. These include enterprise-wide process owners, a statement of enterprise architecture guiding principles, business leadership of project teams, senior executive oversight of architecture initiatives, and IT program managers.

These five practices highlight the need for senior management to articulate business direction, and to implement IT-enabled processes to fulfill the business vision.

Management Practices Key to Stage 4

Finally, in the fourth stage, firms were implementing practices for communicating and assessing IT. These included a one-page graphic for communicating an enterprise vision, post-implementation assessment, a formal research and adoption process, and a full-time enterprise architecture team.

These four practices could seemingly add value at any stage, but their delayed importance to firms in this study and our prior experiences studying IT management practices suggest that firms are failing to take advantage of these tools at an earlier stage. They are valued by firms in stage 4 because these firms have generally benefited from good IT management practices. The survey instrument did not collect behaviors such as developing directories of reusable process components, but we anticipate that the ability to create and reuse application components is critical to the fourth stage.

All Management Practices Support Business Value

What is important to note about the management practices from stages 1 through 4 is that they are cumulative. Practices key to value in stage 1 are still important in stage 2—in fact, they are more important. Thus, if firms do not acquire good practices in early stages, they reduce the odds that they will be able to generate significant value from their IT initiatives in later stages. Long lists of failed ERP and CRM implementations, lightly used data warehouses, and abandoned workflow management systems highlight the potential for wasting money on IT. We interpret these findings to mean that firms embarking on an enterprise architecture journey should plan for steady increases in IT value through gradual enhancements in IT management. We have found no shortcuts to business value from IT.

Speaker 1: Thanks for listening to this reading of MIT CISR research, and thanks to the sponsors and patrons who support our work. Get free access to more research on our website at cisr.mit.edu.