IT OUTSOURCING AND CORE IS CAPABILITIES: CHALLENGES AND LESSONS AT DUPONT

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This article explores the following question: For firms that have outsourced major portions of their IT functions, what core IS capabilities do they need to retain and nurture, or create and develop, to ensure a strong IS capability over time? The challenges and lessons learned from implementing major IT outsourcing arrangements from 1997 to 2004 at Dupont are used to reexamine a previously published IS capabilities framework by the authors.

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*T*HE RESOURCE-BASED PERSPECTIVE ON achieving competitive advantage now has a considerable pedigree, and several studies have applied this perspective to the contribution information technologies (IT) can make to achieving competitive advantage. Notable research has also been conducted in the area of establishing core capabilities within the IT organization (e.g., Ross et al., 1996; Bharadwaj et al., 1996). Feeny and Ross (2000) bring this work together by positing an evolution of the CIO role depending on the maturity of the IT function and the business in their joint abilities to exploit IT.

In allied studies over the past decade, researchers have pointed also to the importance of the ability to manage external IT supply, particularly given the expanding and changing nature of the IT services market (Lacity and Willcocks, 2000, 2001). In particular, detailed case research into major IT outsourcing arrangements has found the relationship dimension between the client and its suppliers to be a critical but complex set of issues to manage (Kern and Willcocks, 2001).

The purpose of this study is to revisit the relevance and efficacy of, and challenges posed by, our own core IS capabilities framework published some seven years ago. Two research questions guided the present study:

Does the model still hold or does it require revision?
What challenges and learning arise from implementing the framework?

REVISITING THE FEENY/WILLCOCKS (1998) FRAMEWORK

We define a *capability* as a distinctive set of human resource–based skills, orientations, attitudes, motivations, and behaviors that have the potential, in suitable contexts, to contribute to achieving specific activities and influencing business performance.

A *core IS capability* is a capability needed to facilitate the exploitation of IT, measurable in terms of IT activities supported, and resulting business performance.

The nine IS core capabilities proposed in the original framework published in 1998 are shown in Figure 1. A brief sketch of the original framework is in order. It arose from field interview research into 53 high performers in the IT

FIGURE 1 Nine Core IS Capabilities (Feeny and Willcocks, 1998)
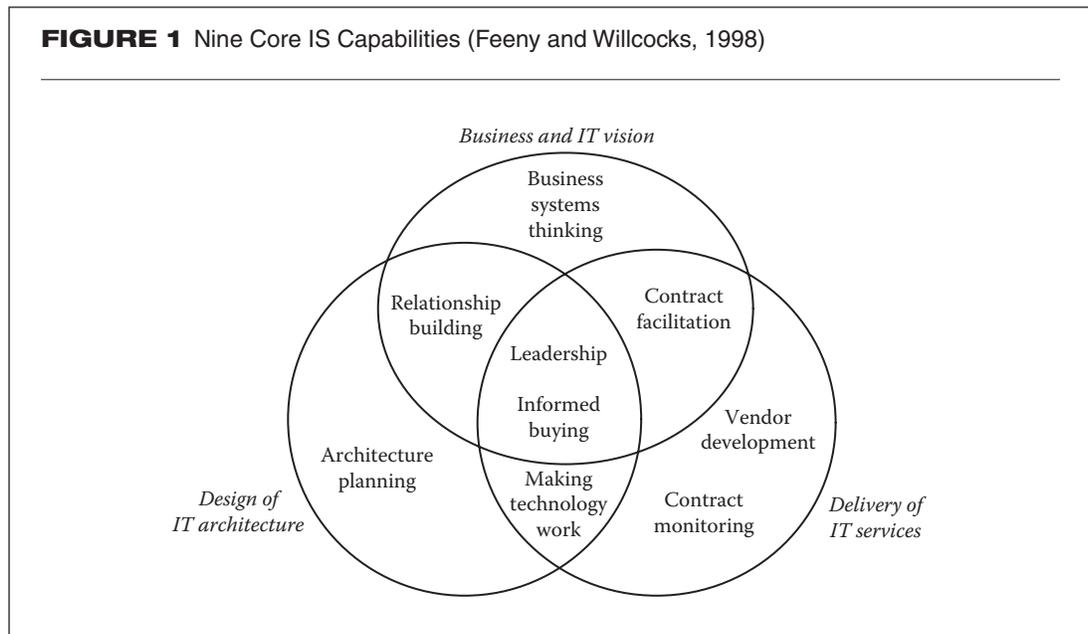
function and interviews with multiple managers within 112 different IT sourcing arrangements in the mid-1990s. The research suggested that a successful IT function has four overall tasks: eliciting and delivering on business requirements; ensuring technical capability; managing external supply; and governance, coordination, and leadership.

Nine capabilities populate seven spaces in Figure 1. These spaces are not arrived at accidentally. Three are essentially business, technology, or service facing. To emphasize these three "faces" we label them as follows:

- Business and IT vision
- Design of IT architecture
- Delivery of IT services

A fourth space in the center of the diagram is a linchpin governance role covered by two capabilities: leadership and informed buying.

The overlapping circles also create three spaces that represent various interfaces between the three faces. The capabilities that populate these overlapping spaces are crucial for facilitating the integration of effort across the three faces: relationship building, informed buying, and contract facilitation.

Descriptions of each of the nine capabilities are provided in Table 1.

Attempting to achieve all nine IS capabilities in the framework presents a number of serious human resource challenges. It requires high performers in each role. Furthermore, in contrast to the more traditional skills found in IT functions, there needs to be a much greater emphasis on business skills and orientation in all but the two very technical roles. There is a significantly increased requirement for "soft" interpersonal skills across all roles, and each role requires a specific set of people behaviors, characteristics, and skills. High performers require challenge and specific attention to their career planning needs.

Our research also suggested that if there were areas where a particular capability was missing or understaffed, then problems arose.

THE CASE RESEARCH

This article reports our findings from longitudinal case research into an IT outsourcing arrangement over seven years at Dupont: the CSC/Andersen Consulting deal (1997–2004), recently reconfigured. Dupont is a very large energy, chemicals, and specialty products manufacturer that in 1997 signed one of the largest IT outsourcing deals at the time ($US 4 billion).

A few years after implementing these outsourcing arrangements, Dupont explicitly adopted the Feeny/Willcocks framework described above. We conducted 26 interviews in one round in the summer of 2001 to discover how the model was being utilized, the challenges it presented, and the outcomes of its use, and have tracked progress since. We have also analyzed numerous in-house documents relating to IT, in-house capabilities, the progress of outsourcing, and the development and success of the IT function.

For this article we therefore use the experiences at Dupont to examine what IS capabilities

TABLE 1 Nine IS Core Capabilities Proposed in the Original Framework

Capability	Description
Capability 1: Leadership	"Integrating IT effort with business purpose and activity." The central task is to devise organizational arrangements — structures, processes, and staffing — to successfully manage the interdependencies and ensure that the IT function delivers value for money.
Capability 2: Business systems thinking	"Ensuring that IT/e-business technologies capabilities are envisioned in every business process." In best practice organizations, business systems thinkers from the IT function are important contributors to teams charged with business problem solving, process reengineering, strategic development, and delivering E-business.
Capability 3: Relationship building	Facilitates the wider dialogue, establishing understanding, trust, and cooperation amongst business users and IT specialists. The task here is "getting the business constructively engaged in IT issues."
Capability 4: Architecture planning	"Creating the coherent blueprint for a technical platform which responds to present and future business needs." The principal challenge to the architect is to anticipate technology trends so that the organization is consistently able to operate from an effective and efficient platform.
Capability 5: Making technology work	"Rapidly trouble-shoot problems which are being disowned by others across the technical supply chain."
Capability 6: Informed buying	Analysis of the external market for IT/E-business services.
Capability 7: Contract facilitation	"Ensuring the success of existing contracts for IT services." The contract facilitator tries to ensure that problems and conflicts are seen to be resolved fairly within what are usually long-term relationships.
Capability 8: Contract monitoring	Located in the exclusive space of the supply face, this role involves holding suppliers to account against both existing service contracts and the developing performance standards of the services market.
Capability 9: Vendor development	"Identifying the potential added value of IT/e-business service suppliers." Anchored in the supply face of our model, the vendor developer is concerned with the long-term potential for suppliers to add value, creating the "win–win" situations in which the supplier increases its revenues by providing services that increase business benefits.

need to be retained, or newly developed, under an IT sourcing arrangement.

CASE STUDY: DUPONT

Dupont is a chemicals, health care, materials, and energy multinational company operating in a range of segments. Its divisions currently include Agriculture and Nutrition, Coatings and Color Technologies, Electronic and Communication Technologies, Performance Materials, and Safety and Protection; Textiles/Interiors/Other was divested in 2004. By the end of 2004 Dupont had $US 27.3 billion revenues and 55,000 employees worldwide. Its more than 20 strategic business units operated in more than 70 countries. From 1996 Dupont strove to focus on core business competencies and has regularly divested noncore businesses. It has also focused on reduction of overhead costs and increased capital efficiency, including IT outsourcing.

In 1997 Dupont signed a series of ten-year IT outsourcing contracts, worth $US 4 billion,

with CSC and Accenture (then Andersen Consulting). By 2002, 80 percent of its IT spending (total: $600 million a year) and 75 percent (3,000) of its IT staff had been transferred to its alliance partners. CSC was responsible for shared infrastructure worldwide and corporate, regional, and business-specific applications, whereas Accenture managed the Chemical division's business enterprise applications. Dupont initially retained 100 (later reduced to 60) central staff to manage the contracts and more than 1,000 distributed technical and business people to provide business IT leadership, process control computing in manufacturing, and R&D computing.

For new project work, Dupont retained the right to source from anywhere as well as from one or both sitting suppliers. As an example, by the late 1990s Dupont had identified a new $400 million worldwide SAP/Y2K project. One supplier brought 400 SAP people on to the project, while, to supplement the other supplier's SAP skills, Dupont transferred 300 people from the divisions over to the supplier, who

then bore the costs of their SAP training. Dupont also adopted a balanced scorecard approach for benchmarking the health of its IT service towers (e.g., telecommunications, data centers, desktops, midrange computing). By 2001 Dupont:

☐ Had reduced its 90 percent fixed IT costs to 50 percent fixed.
☐ Was getting quicker injections of skills from suppliers than it had before outsourcing.
☐ Was achieving increases in some service speeds and flexibility.
☐ Was probably achieving modest cost reductions on a pro rata basis (overall IT budget actually increased with greater demand).
☐ Had given a range of its ex-employees real career development opportunities.

However, by 1999 Dupont was questioning whether it had given away too much IT technical and management expertise, as discussed below.

IT Organization Design and Core IS Capabilities

By 1999 the CIO headed two organizational units: Global Services and Alliance Operations.

Global Services had 70 people providing leadership of strategic planning, architecture, security, emerging technologies, and enterprisewide projects. Oversight of regional and specialized services was delegated to 350 people across five regions responsible for country-specific IT architecture and administration and management of regional vendors. Global Service also had a business unit support group made up of 500 employees across 20 divisions. These people looked after manufacturing process and production controls, business-specific applications, and IT for central R&D.

Alliance Operations consisted of 47 people who managed business unit demand for vendor services, monitored vendor service delivery, developed SLA metrics, and achieved continuous performance improvement. Of the 47, 10 dealt with infrastructure — oversight of the CSC deal and service responsibility for desktop, telecom, midrange, and mainframe. Another five dealt with applications: oversight of Accenture/CSC and liaison with four business divisions. Three employees looked after contract management: performance scorecards and resolution of contract disputes. A further 20 staff members managed IT finance: invoices, charges to business units, audit billing accuracy, and timeliness.

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Although the employee headcounts seemed sufficient, by early 1999 Dupont began to question whether its internal IS capabilities were strong enough. IT managers were often excluded from critical business discussions and decisions. Succession planning for IT leaders and core staff was insufficient and employees were looking for guidance on changing skills and career paths.

About this time Dupont adopted the Feeny/Willcocks framework to begin formalizing competencies, job families, personal development opportunities, and career paths. Dupont defined five of the nine capabilities in Figure 1 — relationship building, leadership, contract facilitation, informed buying, and making technology work — as "general competencies," and pointed to three faces as career paths — business and IT vision (needing business systems thinking), design of IT architecture (requiring architecture planning), and delivery of IT services (including vendor development and contract monitoring). In December 2000 Dupont launched an intranet-accessible career management site, enabling employees to identify the required competencies — business, interpersonal, and technical — for each of Dupont's 55 existing and prospective IT roles.

Our own analysis of Dupont's retained IS capabilities first took place in the summer of 2001. We detail our findings for the three faces below:

☐ **Business and IT vision:** With limited local resources, business unit IS leaders tended to be driven to operate also in relationship building and contract facilitation modes. The focus on service delivery, automation, and firefighting diminished strategy and value creation: business unit executives themselves commonly positioned IT as an agent of cost reduction rather than of business value creation. Business systems thinking was generally squeezed out of the IT frame, and the vendors were not filling the gap in stimulating innovation for business value.

☐ **Delivery of IT services:** We saw the informed buying and vendor development roles needing considerable enhancement. Many business unit IT leaders needed to move from firefighting to a more strategic focus. Making technology work was often underpowered, given the IT demands and the variable strengths of the suppliers operating in different parts of Dupont. Neglect of the vendor development capability contributed to a number of adverse supplier behaviors and

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practices. The vendor relationship had not evolved to a more strategic role, and this inhibited Dupont's ability to tap into the suppliers' intellectual capital. Weakness in informed buying led to limited sourcing vision, limited intra-Dupont learning, and limited future sourcing flexibility. As a result, the issue of how to anticipate and cope with sourcing changes over the next four to ten years was not being addressed sufficiently.

☐ **Design of IT architecture:** Dupont had already noted its weaknesses here and was rebuilding this capability. It needed to develop career paths and more staff for this key area. One weakness identified in 2001 was that building an E-business infrastructure requires that the IT architecture be more closely aligned with business strategy; this was also a weakness in the way the technical capabilities are portrayed in the overlapping rings in the Feeny/Willcocks framework. That is, by 2001, infrastructure and architecture planning were boardroom issues because the technology platform influenced greatly what was and was not possible as a business. The implication for Dupont was to ensure that architecture planning became closely aligned with business planning. Here we recommended development of career paths for this core retained capability, with the possible quick hiring of experienced staff to fill the vital gap left by the vendor.

On a regional basis, we found Asia Pacific quite well adapted and leveraging the core IS capabilities concept. Europe and South America had not yet tailored the capabilities to their environments and resource levels. Some core IS capabilities definitely needed enhancement in terms of making local resources available; in particular, making technology work, business systems thinking, contract facilitation, and contract monitoring.

In terms of Dupont's overall objectives, we felt it could only move from cost reduction to business value if business executives were educated on the transformational possibilities of IT. Specifically, increased delivery speed would require more in-house project management capability and a rapid application development approach; risk–reward contracts with vendors; a change in the bureaucratic process by which work was contracted for and assigned; architecture planning linked to business vision; and strengthened technical "fix" and contract facilitation capabilities in order to leverage the operational service.

Innovation could be delivered through enhanced business systems thinking, informed buying, and vendor development capabilities to unlock vendor potential and greater internal and external networking.

To facilitate these moves, the core IS capabilities framework was correctly positioned for career development, but needed to be further embedded in human resource processes, including selection, appraisal, and reward systems.

By early 2003 the competency modeling and career development self-service efforts had generated several positive results. Eighty percent of staff accessed the site in 2002 and 30 percent created career plans. Employees and managers focused on competencies rather than administrative tasks. By 2003 the company was able to fill 90 percent of key leadership positions internally, despite the fact that it had reduced the pool of potential successors from 4,000 to 1,200 as a result of outsourcing. The projected shortfall of in-demand employees was reduced from 30 in 1999 to two in 2004. The strength of emerging IT leaders was recognized by business management, with 90 percent of business unit CIOs reporting to a business unit VP/general manager, as opposed to 50 percent previously. Even more important, Dupont executives felt they had wrested back control of the company's IT destiny, and it was now in a much better position to leverage its relationships with suppliers and renegotiate sourcing arrangements into the future, as it began to do from 2003 onward.

Analysis of the Dupont Case

Our overall finding of weaknesses in retained core IS capabilities at Dupont, some four years into a large-scale outsourcing arrangement, was not untypical of other large-scale outsourcing arrangements that we have researched (e.g., see Kern and Willcocks, 2001; Lacity and Willcocks, 2001). After outsourcing 80 percent of its IT budget, Dupont discovered it had retained inadequate management and technical expertise to control its IT destiny. Midcontract sag occurred after the transition to outsourcing, raising the question: How much more value and leverage could be gained from the relationships? Benchmarking was introduced for more accurate tracking of performance and as an inducement to improve.

As a global outsourcer with two major partners, Dupont had specific issues to deal with on the distribution of resources locally — in the business units — and centrally. It under-

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resourced the more operational capabilities (managing technology work, contract facilitation, and relationship building), resulting in IT managers and local CIOs having to deflect their attention into these areas and away from more strategic, business-oriented activity. Moreover, despite the size of the outsourcing arrangements, Dupont had not retained enough technical or architecture planning capability either centrally or locally. This proved to be risky for big projects such as the major SAP project allied with the Y2K work in 1999. The other areas of concern were Dupont's ongoing ability to monitor and manage present and future sourcing strategy and develop further business value from the vendor relationships.

Dupont's IT leaders began addressing these issues in 1999, which led the company toward using the core IS capabilities framework in Figure 1 as a basis for staff development and career succession planning. The architecture planning capability was an interesting case in point. Having given away this capability to CSC in 1997, Dupont found it was losing control of designing its technical platform and being able to have informed discussions with vendors. It therefore began recreating this capability in house starting in 2000. Contract monitoring, initially, had seemed detailed enough, but within two years a major benchmarking process had been introduced. Dupont thought it had resourced the business unit IT groups enough, but then it discovered that IT leaders there got pulled too much into operational issues; in addition, too much "doing" (technical fixing) capability had been given to the supplier, run through an overbureaucratic procurement process. We found different business units managing these issues each in their own way. Dupont subsequently also bolstered its senior technical capability and its informed buying capability in order to deal with the renegotiation of its outsourcing arrangements into the 2003–2005 period.

IS CAPABILITIES LESSONS

The Dupont case provides considerable rich insight into how the core IS capabilities can be applied, their relevance, the challenges that can arise under large-scale IS outsourcing arrangements, and how these can be handled by an organization. Below we reflect on what might be learned from attempting to implement the Feeny/Willcocks (1998) framework as lessons learned from the Dupont case. Many of these lessons reflect learnings from other cases that we have researched as well (Willcocks and Feeny, forthcoming; Willcocks et al., 2005); the last two lessons are newer ones that reflect evolutionary changes in IT management since the year 2000.

IS Capabilities in Organizations with Long-Term Outsourcing Contracts

Organizations need to develop a long-term strategic core capability rather than being drawn into firefighting and focusing only on the shorter term capabilities in our framework. Problems develop when any of the core IS capabilities are not suitably staffed, but there is also a tendency in the first few years of an outsourcing contract to neglect the capabilities with longer time horizons — business systems thinking, leadership, and architecture planning — which leads to larger problems further down the line.

As noted in the original framework, high performers with distinctive skills, capabilities, and orientations need to be appointed. They also need to be able to operate as a team.

Issues of core capability development and succession that emerge over time need careful management. Larger organizations (such as Dupont) can deal with this in a relatively strategic manner; smaller organizations that we have researched must stay alive to the issue, using limited resources more opportunistically and spreading capabilities more thinly.

Getting innovation and added business value from outsourcing requires organized, proactive, in-house core IS capabilities being applied to the task. A further challenge at Dupont was to get the business units and power brokers engaged with IT issues. This underlines the importance of the leadership capability and the business-facing capabilities in the IT function. It also points to the fact that, however empowered, the IT function cannot do it alone. Maturity of the business units' capability to manage IT strategically also must occur, and the IT function has an important role to play in that process.

Core IS capability success levels also relate to other mitigating factors; namely, in-place governance mechanisms, inflexibility of outsourcing contracts and deals, the level of resourcing (numbers of staff), supplier capabilities, and responsiveness to new demands.

In our post-2000 case studies, we are finding that the technical architecture capability has to be much closer to and responsive to the

FIGURE 2 The IT Function: Evolution of Core Capabilities and Outsourcing
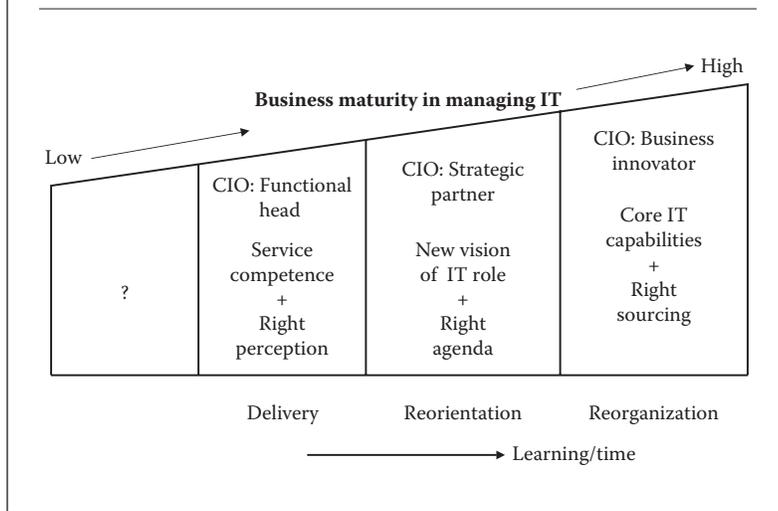
business units than we were finding in the 1990s.

In the 1998 framework, we positioned project management as an organizational rather than a specific IS core capability. Since then, our research suggests that certain aspects of project management may be distinctive to the IT function.

The Future Shape of the IT Function

The Dupont case and other cases we have researched suggest that the Feeny/Willcocks 1998 framework may be best applied as an evolutionary process, rather than as an "instant fix." Figure 2 models this evolution of the IT function as passing through delivery, reorientation, and reorganization phases (see also Feeny, 2000; Feeny and Ross, 2000).

Core capabilities focusing on technology and service are developed in the delivery phase. Particularly important here are making technology work, technical architecture, and contract facilitation. The CIO needs to be highly experienced in building technical service capability. Our casework suggests that this is the time for buying-in IT service resources from the external market and doing only limited outsourcing.

In the reorientation phase, the IT function needs to become more business focused; therefore, relationship building and business systems thinking and a business-oriented CIO become critical. Selective outsourcing is the lower risk sourcing approach and requires a

buildup of informed buying and contract monitoring capabilities.

A fully fledged IS capability can be evolved through the reorganization phase. By this time the CIO may well be a business innovator with a seat on the board. The ability to manage external supply will have been greatly enhanced with a vendor development capability in place and a very strong informed buying capability. Based on our findings, this is the lowest risk phase for large-scale outsourcing.

When Dupont outsourced in 1997 it was, in our view, in a reorientation phase. It mitigated its high outsourcing risk by contracting out to two suppliers and retaining 1,200 staff (with 3,100 transferred staff). Subsequently, it needed to reorient its in-house staff development to reposition itself with the needed core IS capabilities, as detailed above. Business maturity in managing IT outsourcing arrangements also varied across the IT groups in its business units and in some places needed to be further developed.

CONCLUSION

Dupont has, from 1997, operated a relatively successful set of IT outsourcing arrangements. However, this case study underlines the importance of retaining IT leadership and governance; technical planning and doing capabilities; informed buying; and other IS capabilities to manage external sourcing in organizations with large-scale outsourcing arrangements. Success also depends on the operational linchpin tasks of relationship building (to business units) and contract facilitation.

Our case research at Dupont and in many other companies also suggests that the core IS Capabilities framework (Feeny and Willcocks, 1998) provides a robust way of modeling and templating in-house management needs, to identify gaps and develop action plans. Implementing the framework also presents a range of challenges, however. It requires different skills sets, attitudes, and behaviors from those found in more traditional IT functions. Technical ability is no longer sufficient: the IT function now requires distinctive mixes of business and interpersonal as well as technical skills in nearly all roles. In its fully fledged version, the IS capabilities framework requires high performers whose need for challenge and incentives may stretch existing human resource systems, retention policies, and career development processes. ▲

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