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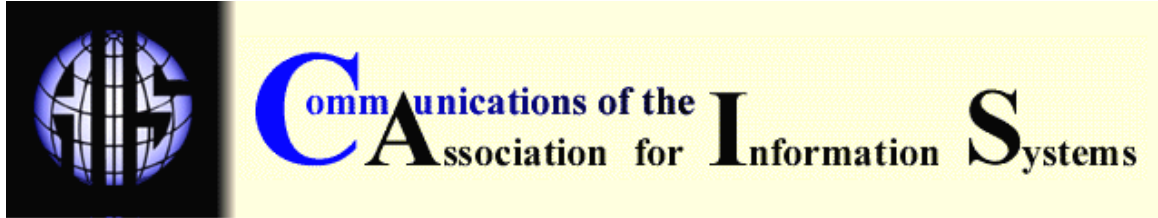
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DEVELOPMENTS IN PRACTICE XXVII: DELIVERING IT FUNCTIONS: A DECISION FRAMEWORK

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ABSTRACT

Despite a steadily growing industry of third party providers, IT organizations to date have ventured rather cautiously into this new area of IT function delivery. This paper attempts to explain why this is so by examining the decision behavior and practices of a number of leading edge organizations. From this analysis, four key decision criteria were identified: flexibility, control, knowledge enhancement and business exigency. Based on the insights of the focus group, the concept of a maturity model for IT functions is introduced as well as a function delivery profile to map delivery options onto core and non-core IT functions. We argue that these elements should form the basis of a decision framework to guide the selection of delivery options. Following this framework, organizations should now begin to move beyond the exploration stage to develop more strategic, nuanced and methodological approaches to IT function delivery.

I. INTRODUCTION

In a recent article, it was pointed out how dramatically the list of IT responsibilities has grown over the last fifteen years (Smith and McKeen, 2006). To the standard list of "operations management", "systems development" and "network management" have now been added responsibilities for "business transformation", "regulatory compliance", "enterprise and security architecture", "information and content management", and "business continuity management" as well as others. Never before has IT management been so challenged to assume such diversity of responsibility and to deliver on so many different fronts. As a result, IT managers have begun to critically examine how they deliver their various functions to the organization.

In the past, organizations met additional demands for IT functionality by simply adding more staff. While this option remains available today, there are now several other possible options for delivering IT functionality. Software can be purchased; customized systems can be developed by third parties; whole business processes can be outsourced; technical expertise can be contracted; data centre facilities can be managed; networking solutions (e.g., data, voice) are obtainable; data storage is available on-demand; and companies will manage your desktop environment as well as all of your support/maintenance functions. Faced with this smorgasbord of delivery options, organizations are experimenting as never before. As with other forms of experimentation, however, there have been failures as well as successes, and most decisions have been made on a "one-off" basis. What is still lacking is a unified decision framework to guide IT managers through this maze of delivery options.

To explore how organizations are choosing to deliver IT functions, we convened a focus group of senior IT managers from a variety of different companies representing several industries including manufacturing, insurance, banking and finance, pharmaceutical, government, retail, automotive and telecommunications. In preparation for the meeting, focus group members were asked to outline their overall strategy for delivering IT functions; identify which delivery options they were currently using; provide examples of each; list the criteria that their organizations used to decide which options to use; and finally, explain how their organizations demonstrated the value of each delivery option. The goal was to develop a framework for deciding which delivery option to deploy. The group was sequestered for an entire day, and the discussion was moderated by one of the authors while the other author recorded the discussion. This paper represents a summary of the focus group discussion.

In the next section, we define what we mean by an IT “function” and propose a maturity model for IT function delivery that emerged from our discussion. Following this, we take a conceptual look at IT delivery options. We then analyze the focus group’s experiences with four different IT delivery options – in-house, in-source, outsource and partnership – in order to contrast theory with practice. The final section of the paper presents a framework for guiding delivery decisions derived from the shared experiences and insights of the members of focus group.

II. A MATURITY MODEL FOR IT FUNCTIONS

Smith and McKeen (2006) list the overall responsibilities for which IT is held accountable. IT functions, in contrast, represent the specific activities that are delivered by IT in the fulfillment of its responsibilities. For instance, IT is held *responsible* for delivering process automation, which it may satisfy by delivering the following IT *functions* to the organization: project management, architecture planning, business analysis, system development, quality assurance and testing, and infrastructure support. While there are myriad functions¹ an IT department provides to its parent organization, a compendium of some key IT functions was created by amalgamating the lists provided by the members of the focus group (see Table 1). This is meant to be representative, not comprehensive. It is presented for discussion purposes and to demonstrate how IT functions can form the basis of a decision framework.

Table 1: List of IT Functions

IT Function	Description
Business Analysis	Liaison between IT and the business to align IT planning, match technology to business needs, and forecast future business directions
Systems Analysis	Elicits business requirements, designs process flow, outlines document management and creates design specifications for developers
Strategy & Planning	Project prioritization, budgeting, financial planning/accountability, strategy development, policy development and portfolio analysis
Data Management	Transactional data (e.g., invoicing, shipping), customer data (e.g., CRM), records management, knowledge management, business intelligence

¹ Some members of the focus group preferred the term “service” to “function”. We chose the term “function” to avoid confusion with the current usage of “service” as in Service-Oriented Architecture (SOA).

Project Management	Managing the resources (e.g., \$, people, time, equipment, etc) necessary to bring a project to fruition in compliance with requirements
Architecture	Establishing the interaction of all system components (e.g., hardware, software, networking), enterprise compliance with specifications and standards.
Application Development	Designing, writing, documenting and unit testing required code to enact specific functionality in compliance with a design specification.
Quality Assurance & Testing	Testing all components of an application prior to production to assure it is functioning correctly and meets regulatory and audit standards.
Networking	Managing all networking components (e.g., hubs and routers) to handle all forms of organizational communication (e.g., data, voice, streaming video).
Operating Systems & Services	Operating systems for all hardware platforms and other devices (e.g. handhelds), upgrades, maintenance and enhancements
Application Support	Provides enhancements, updates and maintenance for application systems plus help and assistance for application users.
Data Centre Operations	Manages all operations of the production data centre and data storage environment including backup, DRP, security and access, and availability.
Application Software	All major applications (e.g., purchased or developed) to ensure viability of functionality and upgradeability with a special emphasis on legacy systems.
Hardware	Data servers, power supply, desktops, laptops, blackberries, telephones and special equipment (e.g., POS, badge readers, RFID tags).

The focus group pointed out that not all IT functions are at the same stage of development and maturity, a fact which members felt had ramifications for how these functions could be delivered. While some are well-defined, common to most companies and commodity-like, others are unique, non-standardized and not easily shared. Encouraged to identify what a maturity model might look like, the focus group agreed on the following five stages – unique, common, standardized, commoditized, and utility.

1. **Unique** – a unique IT function is one that provides strategic (perhaps even proprietary) advantage and benefit. These IT functions seek to differentiate the organization in the marketplace. Such functions are commonly, but not necessarily, delivered by internal IT staff due to the strategic aspect of the function being provided. Alternately, the function may be provided either by “boutique” firms which create special-purpose applications or by firms with in-depth industry experience that cannot be matched by the internal IT staff (or even the internal business managers). Examples of unique IT functions might be business analysis, application integration, or knowledge-enabling business processes. Such functions depend on familiarity of the organization’s internal systems combined with in-depth knowledge of the business.

2. **Common** – This type of IT function caters to common (i.e., universal) organizational needs. Such a function has little ability to differentiate the business but it provides a necessary, perhaps critical, component (e.g., financial systems, HR). Providers capitalize on commonality of function and are motivated to provide functions (e.g., CRM, quality assurance, content management) to maximize market applicability. Most print operations are now common functions, for instance. While they differ from firm to firm, they are required by most firms but rarely provide competitive advantage.
3. **Standardized** – Standardized IT functions not only provide common tasks/activities but adhere to a set of standards developed and governed by external agencies. While multiple perhaps competing standards may exist, the attributes of such functions are well articulated and, as a result, these functions enjoy wide applicability due to their standardization. Providers of such functionality (e.g., billing/payment functions, cheque processing, forms management, facilities management, disaster recovery planning) seek opportunities beyond common functions by promoting (i.e., developing, proposing and/or adopting) standards to enhance the interoperability of their functional offerings.
4. **Commoditized** – These functions are considered commodities similar to oil and gas. Once attributes are stipulated, functions are interchangeable and indistinguishable (i.e., any barrel of oil will suffice). Furthermore, there may be many providers of the function. A good example is application service providers (ASPs) who deliver standard applications developed by third party vendors to client firms without customization. Other commodity functions include network services, server farms, storage capacity, backup services and UPS. What really distinguishes a commodity is the realization that the “risks imposed by its absence outweigh the burdens of maintaining its availability” (Marquis, 2006).
5. **Utility** – A utility function² is a commodity (such as electricity) delivered by a centralized and consolidated source. This source typically consists of an amalgam of suppliers operating within an integrated network capable of generating sufficient resource to fulfill continuous on-demand requests. *Private* utilities operate in competition with other providers whereas *public* utilities tend to be single providers overseen by regulatory agencies which govern supply, pricing, and size. Examples of utilities include internet service providers (ISPs) as well as other telecommunication services (e.g., bandwidth on-demand).

These stages represent an evolutionary progression (or maturation) in IT functionality. According to one focus group member, IT functions “migrate up the food chain”. The logic is straightforward – successful unique functions are copied by other organizations and soon become common; commonality among IT functions paves the way for standardization; standardized functions are easily and effectively transacted as commodities; and, finally, commoditized functions can be provided by utilities should an attractive business model exist. The focus group interpreted this progression as an ongoing process; that is, individual functions would be expected to advance through the sequence of stages as they matured. Furthermore, the continual discovery of new and unique IT functions – which are required by organizations to differentiate themselves in order to create strategic advantage in the marketplace – would guarantee the continuation of the whole evolutionary progression as depicted below.

² This concept has generated a significant amount of interest recently (Hagel and Brown, 2001; Rappa, 2004; Ross and Westerman, 2004). Carr (2005), for example, speculates that not only is the utility computing model inevitable, but it will dramatically change the nature of the whole computing industry in like fashion to electrical generation of the last century.



Using this maturity model, the focus group attempted to classify the IT functions listed in Table 1 according to their attained maturity stage. The results are represented in Figure 1. The differences among various IT functions are quite remarkable. Hardware (including servers and storage) was considered to reside at the commodity end of the maturity model due to its degree of standardization and interoperability, while business analysis remains a relatively unique IT function that differs considerably from organization to organization. Application software is more varied. As Figure 1 indicates, some application software is commodity-like, while other applications are highly unique to individual firms. The remaining IT functions vary similarly with respect to the maturity of their development and adoption industry-wide.

The impetus for the discussion of function maturity by the focus group was an implicit assumption that mature functions would be likely candidates for external delivery while unique functions would be likely candidates for internal delivery. According to Figure 1, functions such as hardware, networks, common applications and data centre operations would be natural candidates for external provisioning while IT planning, business and systems analysis, project management and application development would be more likely provided by internal IT staff. The focus group agreed that these were indeed *general* trends. What proved to be somewhat of a surprise though was the degree to which this generalization did not appear to hold as members of the focus group repeatedly shared examples of their specific sourcing activities that ran counter to this generalization; for example, they in-sourced commoditized functions and outsourced unique functions. We return to this point later in the paper.

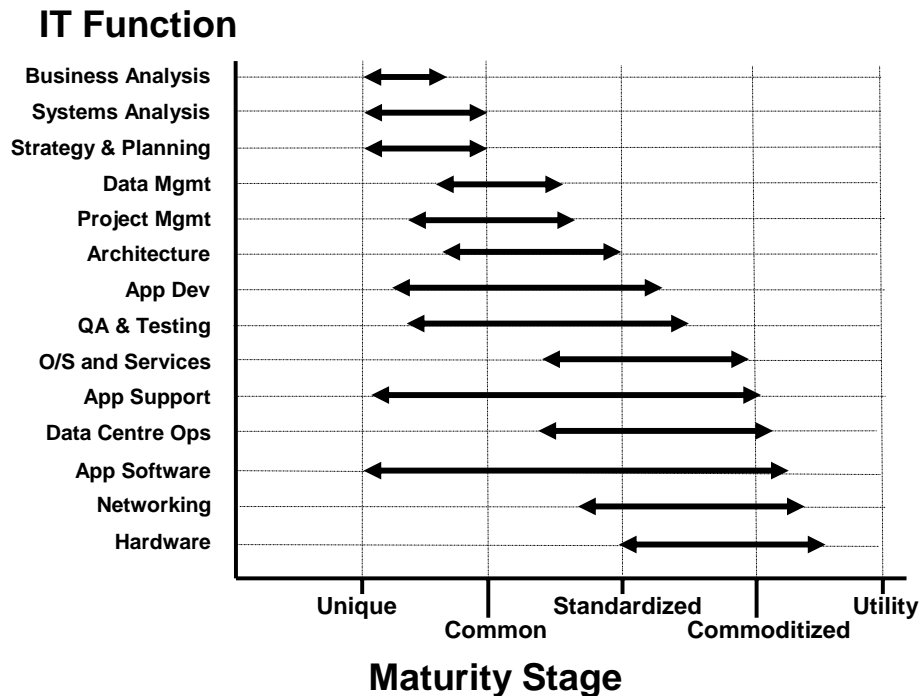


Figure 1: IT Functions Ranked by Maturity Stage

III. IT DELIVERY OPTIONS: THEORY VERSUS PRACTICE

Building on classifications developed by Lacity and Willcocks (2000), the focus group examined four different delivery options for IT functions: in-house, in-source, outsource and partnership.

The following definitions were shared with members of the focus group so that everyone was working from a common understanding of the various delivery options.

1. **In-house** – permanent IT staff provide the IT function.
2. **In-source** – IT personnel are brought into the organization to supplement the existing permanent IT staff to provide the IT function.
3. **Outsource** – IT functions are provided by an external organization using their own staff and resources.
4. **Partnership** – a partnership is formed with another organization to provide IT functions. The partnership could take the form of a joint venture or involve the creation of a separate company.

Members of the focus group were then asked to engage in a conceptual exercise to speculate as to what the relationship between specific IT functions and delivery options should be. The results are depicted in Figure 2, which superimposes the four IT delivery options on the maturity grid.

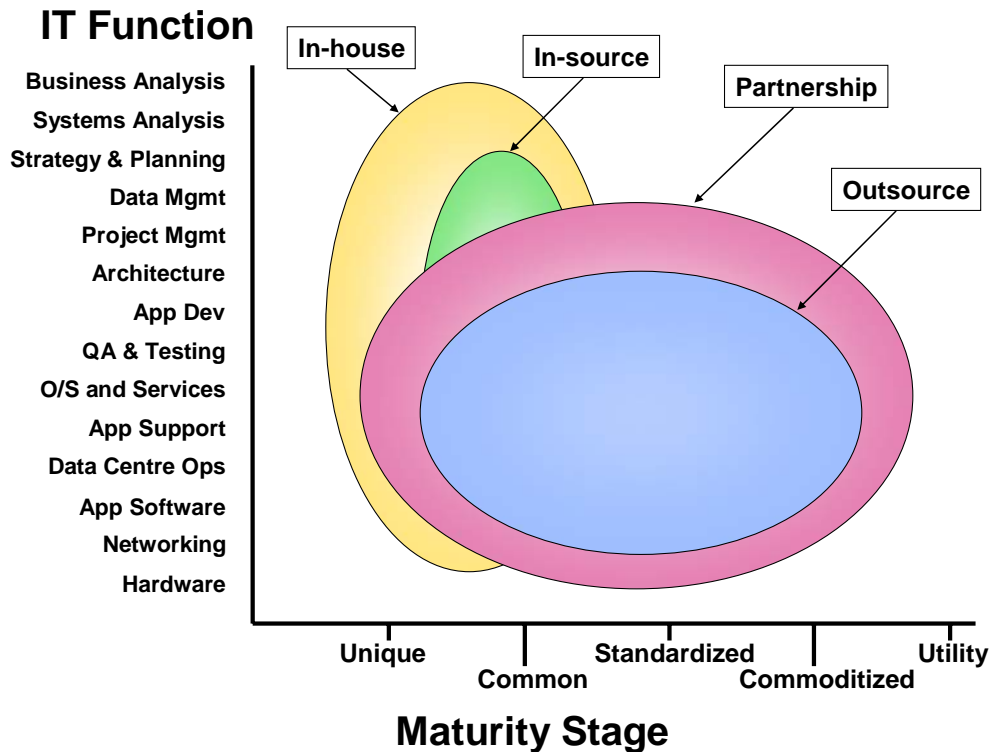


Figure 2: Delivery Options for IT Functions

The logic of Figure 2, as based on the focus group discussion, follows. **In-house** staff are typically assigned tasks which are in the unique-common maturity stages. Asking them to provide commodity-like functions would not be leveraging their unique knowledge of the business. Because of their versatility, they can provide any IT function. As a result, their area of application was seen as being on the left of Figure 2 from top to bottom. **In-sourcing** is basically a strategy of leveraging the in-house IT staff on a temporary basis. As such, contract staff would normally be assigned to work with permanent IT staff on a subset of the full range of tasks provided internally. **Partnerships** tend to exist in the lower part of Figure 2 because the truly unique tasks of business/systems analysis, planning, data management and project management tend to be limited to a single organization and its strategy. Instead, the focus group envisioned partnerships focused on functions such as hardware, applications, software and networking. Such partnerships

can form regardless of maturity stage, which explains the left-to-right positioning of this IT delivery option in Figure 2. Finally, **outsourcing** tends to comprise a subset of partnerships much the same as in-sourcing comprises a subset of in-house functions. The reason is due to differences in governance; outsourcing arrangements are well-articulated and governed by service level agreements (i.e., SLAs) while partnerships are typically governed by MOUs (i.e., memoranda of understanding). If an organization is interested in a more flexible, innovative and open-ended initiative, it would be better advised to seek a joint venture with another firm. Hence partnerships were seen to have broader potential as a delivery option for IT functions.

While Figure 2 represents the focus group’s “generally accepted wisdom” regarding IT function delivery, what is most pronounced is the extent of the overlap of functions provided by the different delivery options. As such, Figure 2 provides limited guidance for managers tasked with choosing delivery options for specific IT functions. In order to gain more insight into decision behavior in practice, the focus group was asked to share recent examples of IT functions they were currently delivering by each of the four delivery options. In addition, they were asked to describe the justification criteria that their firm used in making these decisions as well as the benefits they felt they had realized. These examples were subsequently analyzed and the results used to create Table 2.

Table 2: IT Functions Delivered by Different Delivery Options

IT Function Delivery Option	Examples	Justification Used	Realized Benefits
In-house	<ul style="list-style-type: none"> Strategic system development Legacy system support New system development Helpdesk/desktop support Information/document management Application support Intranet development Technology support Business system analysis Project management Security services (change control) Business intelligence and reporting 	<ul style="list-style-type: none"> Need to have complete control over the intellectual property Need it NOW Work is strategic “Skunk” works Internal consulting to the business 	<ul style="list-style-type: none"> High delivery speed Leverage internal business and system knowledge Ownership of intellectual property Security of data Protection and preservation of critical knowledge Focus on core systems which are considered key assets
In-source	<ul style="list-style-type: none"> Portal development Specialized system (e.g., POS, CRM) development Data warehouse development Database development Intranet development Corporate systems development 	<ul style="list-style-type: none"> Need to have control over project delivery Exposing intellectual property is not an issue Recurring program delivery such as ERP and CRM 	<ul style="list-style-type: none"> Highly flexible (e.g., personnel, engagement and assignments) Best of multiple vendors can be used No need to expand internal IT staff Staff easily meshed with existing teams

IT Function Delivery Option	Examples	Justification Used	Realized Benefits
	<ul style="list-style-type: none"> Contract staff to provide key skills Both local contractors and off-shore company on retainer 		<ul style="list-style-type: none"> Semi-permanent personnel if desired Quick access to specific skill sets Manage people as opposed to contracts Evens out staffing "hills and valleys"
Outsource	<ul style="list-style-type: none"> Infrastructure for new product Business processes (e.g., billing, payroll) Operations Help desk Field service support Network management Technology infrastructure (servers, storage, communications) Web-site development and hosting Technology roll-out New standalone project delivery 	<ul style="list-style-type: none"> The work is not "point of differentiation" Company does not have the competency in-house Deliverable is well-understood and SLAs are articulated to the satisfaction of both parties "The outsourcer is "world class" 	<ul style="list-style-type: none"> Speed to market for specific products/systems Acquire instant expertise as vendors are experts (often world-class) Business risk is transferred to supplier Outsourcer provides more "levers" for value creation (e.g., size, scope) Lower cost than in-house
Partnership	<ul style="list-style-type: none"> Common service (e.g., statement processing and payment services) Emergency backup and support Shared infrastructure Special application development (e.g., critical knowledge requirement) 	<ul style="list-style-type: none"> Realize alignment on a benefit-sharing model Enable collaborating partners to compete with others outside the partnership 	<ul style="list-style-type: none"> Future business growth and/or opportunities that arose from the partnership Benefits were not limited to a specific product or system deliverable Decreased learning time and shared the learning costs with partners

Perhaps the most surprising result based on the examples in Column 2 of Table 2 is the lack of evidence of a relationship between IT function and delivery option. Such a relationship, were it to exist, would provide a natural basis for a decision framework. But, not only does it not exist, there is considerable evidence to the contrary (e.g., the observation that identical IT functions are being delivered by all four delivery options). As a case in point, various types of system development as well as application support/maintenance functions are provided by all four delivery options. Earlier in the paper we noted that generally accepted wisdom (e.g., that commodity functions are ready candidates for outsourcing while unique functions are not) did not appear to hold up. The data in

Table 2 further corroborates this observation. Given this, one wonders what are the operative criteria for choosing delivery options if not the type (or maturity) of the IT function.

IV. THE “REAL” DECISION CRITERIA

In order to explore this issue, members of the focus group were asked to review a recent business case and to share the actual criteria that were used to select the specific IT delivery option. Column 3 in Table 2 illustrates the justifications used for each of the four delivery options. This data paints a much clearer picture of the decision criteria being used by IT managers when selecting delivery options. Two key decision criteria, spanning the range of delivery options, are immediately evident: *flexibility* and *control*.

1. **Flexibility** – As a decision criterion, flexibility has two dimensions: response time (i.e., how quickly IT functionality can be delivered) and capability (i.e., the range of IT functionality). In-house staff rate high on both dimensions. In-sourcing, as a complement to permanent IT staff, is also a highly flexible delivery option. While outsourcing can *theoretically* provide just about anything, as a delivery option it exhibits less flexibility because of the need to locate an outsourcer who can provide the specific function, negotiate a contract, and monitor progress. Finally, partnerships enjoy considerable flexibility regarding capability but much less in terms of response time³. Within a partnership, the goal is to create value for the members of the partnership beyond what can be created by any single organization. How this value is created is up to the partnership and, as long as the parties agree, virtually anything is possible.
2. **Control** – This decision criterion also has two dimensions: delivery (i.e., ensuring that the delivered IT function complies with requirements) and security (i.e., protecting intellectual assets). Because they rank high on both dimensions of control, in-house and in-sourcing options are favored in cases where the work is proprietary, strategic, “below the radar” (i.e., skunk works) or needed immediately (see Table 2). Outsourcing is the preferred delivery option when the function is not considered “a point of differentiation” and the deliverable is well-understood and easily governed by means of a service level agreement. Partnerships are designed to be self-controlling by the membership and, as previously observed, the functions provided by partnerships tend to be more open-ended than those provided by other options.

In Table 2, Column 4 presents the benefits of each delivery option. For the most part, this list is closely aligned with the list of justifications found in Column 3. As such, it reinforces the existence of flexibility and control as key decision criteria. But, in addition, a third key factor appears – *knowledge enablement*. Mentioned only tangentially within the list of justifications (e.g., “competence”, “internal consulting” and “world class”), it is much more evident within the list of realized benefits (e.g., “leveraging internal business and system knowledge”, “preservation of critical knowledge”, “quick access to specific skill sets”, “decreased learning time” and “sharing the learning costs with partners”). Marquis (2006, p. 14) argues that “what is not easily replicable, and thus is potentially strategic, is an organization’s intelligence and capability. By combining skills and resources in unique and enduring ways to grow core competencies, firms may succeed in establishing competitive advantage”.

3. **Knowledge Enhancement** – Behind many delivery decisions is the need to either capture knowledge or retain it. One firm cited the example of developing a new business product. While it “normally” would have been outsourced, it was intentionally developed by in-house staff augmented by key contract personnel. The reason was to enable the

³ Response time within a partnership depends on two interdependent conditions holding: a) a partnership must already exist, and b) all partners must be committed to the same delivery timeline.

knowledge of this new business product to be transferred to internal IT personnel as well as to business personnel (who were also unfamiliar with this type of business offering). At another firm, the decision was made to in-source key expertise “not to do the work but to train internal staff how to do the work”. The focus group member claimed that “it would have been more logical and far cheaper to outsource the whole project”. In another firm, the support function for a key application was repatriated because the firm felt that it was losing an important learning opportunity which would keep staff abreast of developments in the market and develop new knowledge concerning a key line of business with growth potential. Furthermore, it is not just knowledge development that is the critical factor; the focus group suggested that knowledge retention is equally important. Whether implicitly or explicitly, knowledge enhancement appeared to play a key role in most delivery decisions.

The focus group discussion also revealed the existence of two distinct sets of decision criteria: “normal” versus “actual”. Member after member of the focus group explained their decisions with the following preface – “*normally* we would make the decision this way ... but in this case we *actually* made the decision differently”. When the group referred to the normal set, they primarily cited issues of flexibility, control and knowledge enablement. But when they described the actual decision criteria used to select the delivery option, a fourth factor emerged – “business exigency”.

4. **Business Exigency** – Unforeseen business opportunities arise periodically, and firms with the ability to respond do so. Because of the urgency and importance of these business opportunities, they are not governed by the standard planning/budgeting processes, and indeed, most did not appear on the annual IT plan. Instead, a decision is made to seize the opportunity, and normal decision criteria are jettisoned in order to be responsive to the business. In these cases, whichever delivery option can produce results fastest is selected. The delivery option could be any of the four but is less likely to be a partnership unless the urgent request can be accommodated within the structure of an existing arrangement. Seen in a resource planning context, business exigency demands constitute the “peaks” or “spikes”. As one member of the focus group stated, “we have peaks and valleys and we outsource the peaks”.

It is difficult to ascertain the full effect of this last decision criterion. Certainly business exigency is a dominant factor. In an urgent situation, the fastest delivery option will take precedence. However, it is likely that the other three decision criteria play a significant role in the majority of delivery decisions regarding IT functionality. We are left to conclude that business exigency plays a more dramatic but less frequent role.

V. A DECISION FRAMEWORK FOR DELIVERING IT FUNCTIONS

As a final request, members of the focus group were asked to outline a set of strategies for deciding how to deliver IT functions based on their collective experience and insights. The following step-by-step framework emerged.

1. IDENTIFY YOUR CORE IT FUNCTIONS

The identification of core functions is the first and most critical step in creating a decision framework for selecting delivery options. One member of the focus group captured this as follows:

“the days of IT being good at all things have long gone... today, you have to pick your spots ... you have to decide where you need to excel to achieve competitive differentiation ... being okay at most things is a recipe for failure sooner or later”.

It was argued that the IT organization should approach the exercise of identifying core IT functions by taking a page from the business handbook; that is, decide where your competitive advantage lies, buttress it with your best resources, and divest all ancillary activities. In the case

of IT, “divestiture” translates into seeking external delivery of functions as the responsibility and accountability for all IT functions will always remain with the IT organization.

Table 3: Sample Function Delivery Profile

Core Function?	IT Function	In-house	In-source	Outsource	Partner-ship
Yes	Business Analysis	✓			
	Systems Analysis		✓		
In Future	Strategy & Planning		✓	✓	
In Future	Data Management		✓		
Yes	Project Management	✓	✓		
Yes	Architecture	✓	✓		
	Application Development		✓	✓	✓
	QA & Testing		✓		
Now but not in future	Networking	✓			✓
	O/S & Services		✓		
Yes	Application Support	✓			
	Data Centre Operations			✓	
	Application Software			✓	✓
	Hardware			✓	

Asked what constitutes a core function, the focus group suggested that it would depend entirely on where and how the IT organization decides it can leverage the business most effectively. Interestingly, what was considered core varied dramatically across the sample of organizations within the focus group. The range spread across the entire spectrum of IT functions including legacy system enhancement, business process design, enterprise system implementation, project management, and even data centre operations! The only conclusion that resonated with

the entire group was that “it matters more that the IT organization has identified core functions than what those functions actually are”.

The articulation of core functions has major implications. First, the selection of core functions lays the cornerstone for the decision framework for delivery options. That is because, ideally, internal IT staff are assigned delivery responsibility for core functions, which by default, assigns non-core activities to the remaining three IT delivery options (as we will see in the next strategy). Second, the selection of core functions directly impacts the careers of IT

personnel. For example, one focus group manager explained that at her organization “project management, business process design, and relationship management are key skills and we encourage development in these areas”. The implications for IT staff currently fulfilling “non-core” roles can be threatening as these areas are key targets for external delivery.

2. CREATE A “FUNCTION DELIVERY” PROFILE.

One focus group member introduced the concept of a “function delivery” profile – a device that had been deployed successfully within his organization. It is reproduced in Table 3 modified to accommodate the list of IT functions found in Table 1. This sample profile demonstrates: 1) current core functions, 2) future core functions (additions and deletions), and 3) the preferred delivery options for each IT function. What is most important is that this profile is built on an internal assessment of core IT functions. The justification provided by this particular organization for their specific delivery profile follows:

- Project management, business analysis and architecture (both system and enterprise) are primarily provided in-house but may be augmented with in-sourced resources as required. In-house delivery is preferred for these functions for two reasons; first, project management and business analysis are recognized strengths within the organization; and second, this gives the organization more control over project direction.
- Because it is not recognized as a core function, development is primarily outsourced or in-sourced depending on the scope of the project.
- Quality assurance (QA) and testing is largely in-sourced as it is recognized as a highly specialized skill but not a core function. As a result, an entire division of IT is dedicated to this activity. Resources within this group are primarily contractors from a variety of vendors.
- Application support is a designated core function. Given their depth of business process knowledge as well as their in-depth knowledge of key applications, this function is staffed entirely by internal IT personnel.
- Networking is currently provided by in-house staff but is in transition. A recently-formed partnership will eventually make this a non-core activity, and networking will eventually be provided entirely by the partner. This delivery option allows cost sharing and accommodates future growth. The partnership does not provide competitive advantage; it just makes good business sense.
- The strategy and planning function as well as data management have been designated as future core functions. The firm is in-sourcing expertise from a top strategy consultancy to transition this skill to internal IT personnel. This explicitly recognizes the emerging importance of IT to the firm. Similarly data management needs to become a key competitive strength in order to shorten product development cycles and time to market.

The sample profile depicted in Table 3 does not represent a “preferred” or even “typical” IT delivery strategy. Instead, it simply demonstrates how the four delivery options combine to satisfy the IT needs of a specific organization. Other organizations with a different mix of core functions (or even with the same mix for that matter) might well demonstrate a very different profile.

3. EVOLVE FULL-TIME IT PERSONNEL

Because of the alignment between core IT functions and in-house delivery, it is evident that delivery decisions should be based on leveraging an organization's full-time IT personnel. In fact, the focus group argued that this factor should be used to determine the majority of sourcing decisions. It is based on the realization that the permanent IT personnel collectively represent a major investment by the organization, and this investment needs to be maximized (or at least optimized). This reinforces the previous discussion of "knowledge enhancement" as one of the key decision criteria in the selection of IT delivery mechanisms. According to a member of the focus group,

"We choose a delivery option based on how it can build strength in one of our designated core competency areas. This may involve in-sourcing, outsourcing, a partnership or any combination of these ... we have never outsourced a core competency"

The sample profile in Table 3 suggests how the three external delivery options (i.e., in-sourcing, outsourcing and partnerships) can be used to supplement permanent IT personnel. Furthermore, the focus group suggested that a precedence ordering should exist among the delivery options. Specifically, in-house and in-sourcing considerations are resolved before the two remaining delivery options (i.e., outsourcing and partnerships) are explored. The criteria to be used to decide among outsourcing and partnerships as delivery options should be flexibility, control and business exigency (given that knowledge enablement is used to decide among in-house and in-sourcing). In-sourcing, in particular, can be used strategically to bring in expertise to back-fill knowledge gaps in core IT functions, address business exigency needs, and take on new (or shed old) core functions. Furthermore, in-sourcing represents variable costing so there is usually maximal flexibility which helps to smooth out resource "peaks and valleys".

The other method suggested by the focus group to evolve internal IT staff, beyond supplementing them with the three external delivery options, is to hire strategically⁴. The focus group suggested that the range of IT delivery options actually permits what one member referred to as "strategic" hiring as opposed to "replacement" hiring. In the past, IT organizations felt the need to "cover all the bases" with their hiring and, as individuals departed the organization, replacements were sought. Today, however, there is no such impetus. In fact, attrition in non-core areas would be considered advantageous as it would permit reinforcement hiring in designated strategic areas. This approach extends to permanent staff as well; that is, existing staff are strongly encouraged to develop their skills and expertise in alignment with designated core IT functions.

4. ENCOURAGE EXPLORATION OF THE WHOLE RANGE OF DELIVERY OPTIONS

Based on our sample of companies, it can be concluded that we are in the learning phase of IT function delivery. Some members of the focus group were clearly taking advantage of this opportunity and exercising their options in many different, often creative, ways. Others, perhaps more reticent, were sampling less broadly – choosing to stay within their "comfort zone" – delivering IT functions predominantly with in-house resources. Most, however, were somewhere in the middle; that is, actively exploring different types of delivery options mostly for the first time. In all cases, exploration appears to be taking place without a strategy or guidelines; hence, decisions are taken one at a time. As a result, learning has been piecemeal – a phenomenon which may partially explain the lack of established trends in Table 2.

⁴ While organizations continuously search for top IT talent, there appears to be a general aversion to increasing permanent staff among the focus group companies. Reluctance to expand the IT staff naturally favours external delivery options. The focus group felt that it was certainly possible that this hiring aversion was fuelling the growth in delivery options such as in-sourcing, outsourcing and partnerships but was reluctant to use this factor to explain their IT delivery behaviour. Instead, they claimed that the real driver was the existence of many alternative sourcing options many of which have demonstrated the capability of providing superior results.

5. COMBINE DELIVERY OPTIONS STRATEGICALLY

One of the key reasons for focusing on IT functions as opposed to another unit of analysis (e.g., projects, applications or services) became clear by way of an example. As explained by a member of the focus group, satisfying data storage needs could involve the provider's equipment, facilities and staff. Or, it could be the organization's hardware and staff in the provider's facilities ... or basically any combination of the above. In each of these situations, the organization could justifiably claim that it had "outsourced" its data storage. Such a claim would be highly ambiguous. As a result, decisions need to be focussed on the delivery of specific IT functions; that is, a micro versus a macro view.

Adopting a micro view makes it possible to entertain the use of *combinations* of delivery options for the provision of IT functions. Forum members pointed out that multiple delivery options are often used within a single project. In fact, they suggested that selecting a single delivery option for a project in its entirety is fast becoming non-standard practice. The reality is that multiple providers are necessary to meet today's demands ... particularly those of the business exigency variety. This need for an amalgam of delivery options is easily understood with functions like application development. Here, requirements and design may be done in-house, coding may be outsourced to a third party, testing and quality assurance may be done by in-sourced experts, and implementation and rollout might be in partnership. According to the focus group, combining separate delivery options strategically can result in realizable benefits such as speed to market and quality of product or service. Speed to market results from parallel, synchronized development, and quality results from engaging delivery options based on demonstrated expertise and best practice.

VI. CONCLUSIONS

Despite a steadily growing industry of third party providers, IT organizations to date have ventured rather cautiously into this new area of IT function delivery. This paper attempts to explain why this is so by examining the decision behavior and practices of a number of leading edge organizations. From this analysis, four key decision criteria were identified: flexibility, control, knowledge enhancement and business exigency. Today, IT managers have an incredible range of available options in terms of how they choose to deliver IT functions. Clearly the mistake is not to investigate the full-range of these options. What has been lacking is greater direction and guidance in selecting IT delivery options. Based on the insights of the focus group, the concept of a maturity model for IT functions is introduced as well as a function delivery profile to map delivery options onto core and non-core IT functions. We have argued that these elements should form the basis of a decision framework to guide the selection of delivery options. Following this framework, organizations should now begin to move beyond the exploration stage to develop more strategic, nuanced and methodological approaches to IT function delivery.

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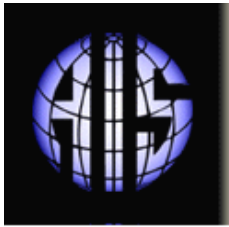
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