Running Information Technology as a Business

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Abstract

The Information Technology (IT) organization within ABC is challenged with several key issues. ABC IT has been unable to measure the business value of the products and services it provides to the organization's internal customers. ABC IT can also be more proficient in capitalizing on economies of scale and scope. Furthermore, the IT organization needs to increase its capability in providing value-added services to the users of IT within the ABC enterprise.

This analysis studies the aforementioned issues by looking at the external and internal environments of the IT Function within the ABC organization. The analysis explains the role that the IT Function plays in the business of ABC and discusses the value that the IT Function creates for ABC. This study also describes the inefficiencies created by an internal market failure with respect to the IT Function. ABC IT's strengths and weaknesses are also considered from the perspective of products, personnel, organizational structure, financial constraints, and management. Alternative courses of action are presented and evaluated. The analysis concludes with a recommendation for creating an efficient market for IT products and services within the ABC organization.

Dedication

There are many who have made this possible for me. I would like to dedicate my work to all my family and friends. There are a few who have been particularly significant in my success. First, my parents who encouraged me to take the program in the first place and remain my number one supporters of all I do. Second, my good friend John, who understood and always helped even when his world was crazier than mine. Third, my program colleagues, in particular Dave, Guilhem and Steffen; they taught me a lot and made work fun. One colleague and friend in particular was always there for me, Stephanie Hayes. Last but not least I want to thank my love, who has taught me happiness; above all the greatest lesson. Chris - thank you. Thank all of you.

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1 Strategic Issues and Problems

The Information Technology (IT) organization within ABC ("ABC IT", "IT Function", or "IT Department") faces many issues. Interviews with key members of ABC IT and consultations with customers of IT services revealed many concerns with existing operations. The three main issues concerning the IT Function relate to:

- Difficulties of the IT organization in measuring the business value of IT services;
- Limitations of ABC IT on capitalizing on economies of scale and scope; and
- Problems the IT Department has in providing value-added services.

This section explains these critical issues in further detail. Subsequent sections will investigate and analyze the characteristics of the IT Function and its environment. This analysis will yield a selection of alternatives and possible courses of action for the IT organization, going forward. The analysis concludes with a recommendation, including an explanation as to why this option was selected and what this choice will mean for the ABC IT Function.

1.1 Business Value Issue

ABC IT offers its customers an extensive list of services. Customers of the IT organization are end-users within the ABC organization that use and benefit from the services provided by the IT Function. End-users within a firm are typically referred to as internal customers. For the purposes of this analysis, these internal customers of IT services within ABC are referred to as IT Customers or customers of IT.

IT Customers may, in fact, realize the value derived from the use of these services. However, IT has not been able to quantify the benefit of these services to IT Customers.

As such, there are no sufficient metrics in place to gauge the IT Function's performance in providing IT services to the customers of IT. Consequently, there is uncertainty that IT is inefficient in the planning and delivery of these services to the internal customers of the ABC organization.

The current system does not communicate the value provided by IT services nor does it allow for this value to be calculated or measured. The inability to determine which customers derive benefit from these services makes it difficult to develop a direct link with customers. This creates a disconnect between the IT service providers and the customers of IT. IT Customers use IT services on a daily basis and, as such, are able to know the value of the services in performing their jobs. On the other hand, ABC IT is not able to measure the value of IT services to its customers; but is required to determine how to allocate limited resources to provide these services.

To create and provide value, the IT Function needs to know which of the current service offering is actually making the best use of the limited resources available to IT. A solid understanding of the relationship with its customers will ensure that the IT organization can determine and maximize the business value of IT to the ABC organization.

1.2 Economies of Scale and Scope Issue

ABC is a global organization that has grown rapidly through acquisition. The IT departments of three separate companies were consolidated. This created redundancies in positions and roles within the IT Function. The roles and responsibilities that created an obvious duplication of efforts were eliminated.

The resulting IT organization continues to maintain a legacy organizational structure that suits a single-site organization but not a multiple-facility business that ABC IT is at the present time. The IT Function remains organized along functional lines. The merits of this configuration have yet to be assessed for the current IT organization. In addition, many legacy site-specific products are supported. Consequently, many individuals across the global IT Department are still performing jobs that result in the duplication of efforts. At the same time, other essential tasks or projects are not being considered due to a lack of resources.

The current product offerings need to be reconsidered to limit scope. By standardizing and limiting the scope of the products offered, a single individual from a remote location could easily perform many of the duties that are currently performed by on-site IT personnel. Standardization and limiting product scope creates economies of scale, as fewer individuals would be needed to support the organization. Economies of scale and scope, and a reallocation of human resources, allows the IT organization to reduce operating costs and free personnel for work on other value enhancing tasks and projects.

1.3 Value-Added Services Issue

As a whole, the members of the IT Function feel that ABC IT operates in a reactive, rather than a proactive, capacity. IT is constantly 'fire-fighting' instead of devoting time and resources to investigate ways in which technology can provide additional value to the entire organization. The resources available to investigate solutions demanded by IT Customers are limited. In addition, IT is constrained from exploring and experimenting with potential solutions of which its customers are unaware.

The IT organization is one of the few departments within ABC that has an intimate view of all aspects of the business. Through this luxury, ABC IT has the opportunity to discover or create cost-saving solutions that will provide value to the organization, as a whole. This is currently not feasible due to the absence of a strategy or process to support such an initiative.

2 Background of ABC and the IT Function

The goal of this section is to lay the foundation for the strategic analysis that will follow in later sections. It will start by providing a background of the organization and the Information Technology business unit. The section will continue with a description of the IT Department's lines of business, followed by a detailed account of all the products and services provided by ABC IT.

2.1 ABC, Inc. - Overview of the Company

ABC Inc. ("ABC") is recognized as the world leader in its high-tech niche. The company's goal is to be the first company to widely commercialize its high-tech product while maintaining technology and service leadership. ABC has offices in Canada, the United States and France. Namely, these offices are located in Winnipeg, Manitoba; Miami, Florida; Dallas, Texas; and Paris, France.

ABC was founded in 1979 as a research and development organization under the name ABC Industries Inc. ABC began with a non-bureaucratic company culture, which included the founder and a team of three directors.

By the early 1980's, ABC had developed a high-tech product and grew into a research company with unique competencies in its product area. ABC's management made a conscious decision to actively exploit government funding to pursue the commercial potential of the basic research in which the company was involved. In 1983, ABC began developing its current flagship product.

By the early 1990's, ABC shifted its focus from conducting basic research to becoming a major manufacturer. As its new technology was making significant impacts in major markets around the world, key players in the industry began showing considerable interest in ABC's proprietary technology. Subsequently, the company's ownership

structure was diluted through government funding, large equity investments, strategic alliances and partnerships.

In 2001, ABC significantly expanded its business through acquisitions. The company acquired a division of XYZ Systems Inc., through ABC's wholly owned subsidiary, ABC Special Products Inc. The company also increased its ownership of LMN Groupe, now called ABC Groupe and PQR Corp., now called ABC Corporation. In 2002, ABC announced a five-year plan that provides for a significant reduction in cash consumption, an organizational restructuring, additional development funding and a further commitment to its major markets (ABC Inc. Annual Report 2002). Today, ABC is the world leader in developing its core technology and is moving towards becoming an industry leader in the manufacturing and marketing of these products.

2.2 The IT Function – Overview of the Organization within an Organization

Since the company's inception, ABC has grown from a small company with familial roots into an organization that has significantly expanded its business through partnerships and a series of acquisitions. The IT Function at ABC has been an integral part of the organization during this period of expansion. The IT Function provides the technology and information solutions that ABC needs to achieve its business goals. The IT organization provides the technology infrastructure used by ABC employees to create and share information. Additionally, ABC IT works with its customers, end-users employed at ABC, to develop and implement information-based solutions.

ABC IT supports the organization in each of its locations across the world: Winnipeg, Manitoba; Miami, Florida; Dallas, Texas; and Paris, France. The current IT Function is a consolidation of four separate IT entities that existed prior to the organization's amalgamation of the acquired businesses mentioned earlier. In 2001 and 2002, ABC combined these different IT organizations into one distinct, centralized body, managed from the Canadian headquarters. IT personnel that ultimately report to the head office in Canada support the ABC network and company's global operations.

2.3 The IT Function – Lines of Business

ABC IT provides products and services to the customers of IT throughout the global organization. The IT Department offers a broad product/service-offering but, as mentioned earlier in the analysis, it is unable to measure the value derived by the customers of IT. This section details how ABC IT organizes its different lines of business and gives a brief overview of what the IT Function provides the ABC organization. A more detailed description of the specific products and services provided by the IT Department is offered in the following section of the analysis.

The IT Function services the global organization and is charged with the responsibility of providing customer support, business solutions and software applications, and the hardware and network related infrastructure required to support the enterprise's information systems. These products and services are managed under three distinct lines of business within the IT Function: Customer Support, Business Solutions, and Operations.

Customer Support

IT Customer Support provides desktop related hardware and software, audio-video (AV), and communications support to all end-users within the ABC organization. Customer Support provides assistance for issues related to desktops, printers, PDAs, cellular phones, pagers, AV equipment, and cabling. The services provided by Customer Support include the following:

- Consulting/Planning
- Acquisition/Procurement
- Implementation/Deployment
- Desktop and desk-side support
- Hardware Maintenance
- Telecommunications Support
- Hardware Disposal/Disposition

Business Solutions

IT Business Solutions provides solutions and analysis services to ABC's end-users. The major services offered under this line of business are:

- Systems and Business Analysis
- Web Technology/Development
- Application Development
- Enterprise Systems/Application Support
- Database Management

IT Operations provides and manages the technology infrastructure and implementation solutions related to the organization's global network and server architecture. IT Operations is responsible for the providing support for the following services:

- Network Management
- Data Centre Management
- Server Administration
- Security/Virus Management
- Email Management
- Mobile and Remote Computing
- Storage Management
- Network/Server Performance and Capacity Planning

2.4 The IT Function – Products and Services

As mentioned in the previous section, ABC IT supports the company's global operations by way of its Customer Support, Business Solutions, and Operations lines of business. Through these lines of business, ABC IT provides its customers a variety of products and services, which will be detailed in the coming sections. ABC IT's offering to its customers is distinguished as products, physical assets of the IT Function, and services, activities performed by the IT Function.

Products are comprised of tangible assets, such as hardware and software. Products are used by IT Customers. On the other hand, services are a value-added offering and support IT Customers in the use of the products.

Table 1 List of IT Service offerings

ANX/ENX Connectivity	Local Area Network
Asset Purchase, Inventory, and Disposal	Print Services
Business Applications Support	Procurement
E-mail – External and Internal	Remote Access
Enterprise Service Desk (ESD)	Security Management
File Sharing	Software Support (Desk-side Support)
Hardware Repair	Telecommunications
Information Backup and Restore	Video Conferencing
Internet Access	Virus Protection
Installations, Moves, Adds and Changes	Wide Area Network (Inter-Networking)

Source: (ABC Inc. IT Service Catalogue)

2.4.1 Services

Table 1 provides a list of the services offered by ABC IT. The purpose of this list is to give a broad picture of the range of areas in which the IT Function is involved. It also provides some groundwork for the examination of the wide-range of skills, covered in the analysis of internal characteristics, required by IT personnel. This section gives a detailed description of these services.

ANX/ENX Connectivity

The ANX/ENX Network is a dedicated, high-performance IP data network that enables subscribed automotive partners located all over the world to communicate, collaborate, and transact business quickly, reliably, and securely. The ANX/ENX Networks are private and isolated from the public Internet. IT provides access to the ANX/ENX for e-mail exchange.

Asset Purchase, Inventory, and Disposal

IT coordinates the purchase of all IT-related assets including desktops, laptops, servers, printers, PDAs, and general use software. IT is responsible for inventory and discarding of excess IT equipment and facilitates the deployment of upgraded and refurbished equipment into the ABC workplace.

Business Application Support

Business Systems/Application support provides database and application monitoring as well as resolutions to incidents related to the functionality of the various systems within the ABC organization. Business Application Support also provides assistance in resolving incidents related to software applications.

E-mail Internal

The internal e-mail service provides the ability to send and receive messages within the ABC organization.

E-mail External

The external e-mail service provides the ability to send and receive messages outside the ABC organization.

File Sharing

File sharing provides the ability to store and retrieve files on the ABC network. This includes storage space, secure access, backup, and virus protection.

Hardware Repair

IT provides for the remedial maintenance for hardware failures on computers, monitors and printers. This includes problem diagnosis, repair or replacement of defective components or dispatch to a third party maintenance provider.

Information Backup and Restore

IT performs backup and retrieval of files or databases in case of equipment failure or other disaster.

Internet Access

IT provides Internet access for business use.

Installations, Moves, Adds and Changes

IT performs installation of new computer equipment as well as relocating computer equipment from one location to another. IT is responsible for adding hardware or software to existing computer equipment and for upgrading existing hardware or software if and when required.

Local Area Network

IT maintains the LAN network making it possible for the connected users to share files, applications, and information quickly and easily.

Print Services

The network printing service includes all printers within the ABC network.

Procurement

IT offers the procurement expertise that is required when selecting hardware, software, accessories or services.

Remote Access

IT provides access to the ABC network from remote locations. IT Customers may get access to Internet through an Internet Service Provider (ISP). Once connected to an ISP, IT Customers may be able to access ABC's network though a secure VPN connection.

Security Management

IT security management protects information from a wide range of threats to ensure business continuity, minimize business damage, maximize return on investments and business opportunities, and protect intellectual property. Security Management is achieved by implementing a set of controls, including policies, practices, procedures, organizational structures and software functions. Security Management encompasses security policies, network access control and permissions, managed firewall protection, virus protection, information encryption, and secure communications.

Software Support

Issues that cannot be resolved by the Enterprise Service Desk are escalated to the desk-side support personnel for resolution. If the desk-side support team is unable to resolve the issue, it will be further escalated to the appropriate technology technician for final resolution.

Telecommunications

Telecommunications service includes the following:

- Local carrier services provide the capability to make and receive local calls. IT provides a phone set and connectivity to the phone company.
- Long distance carrier services allow long distance calling to anywhere in the world.
- PBX Switch and telephone set maintenance including installs, moves, additions and changes.

Video Conferencing

IT manages this service through the use of cameras, video displays, microphones, and speakers.

Virus Protection

IT protects the organization by taking preventative measures to block viruses; screen e-mail attachments; scan the network to remove viruses; and updates signature files.

Wide Area Network (Inter-networking)

IT maintains the WAN network making it possible for the connected users to share files and applications across multiple LANs.

Enterprise Service Desk

The Electronic Service Desk is the most used service offered by Customer Support. When requesting service, an IT Customer would place a call to the Enterprise Service Desk (ESD). If the request is minor, for example password changes or "how to" questions for out of the box software, then the ESD resolves the issue directly. If the particular request cannot be resolved by the ESD, an incident report is created and forwarded to desk-side support.

For each incident report, the ESD categorizes each call or request with a specific service priority. Service priorities are classified as follows:

1. **Priority 1** - All services at one location or one service at all locations are not available or an incident that could potentially have significant business impact.
2. **Priority 2** - Some services at one location are not available.
3. **Priority 3** - All services for one person or one service for a workgroup are not available.
4. **Priority 4** - Incidents where a commitment has been made to the customer for resolution by a specific date/time.

The Customer Support follows response and resolution targets based on the assessed priority level of the specific request. The response time is defined as the time required for a technician to contact the IT Customer once the call has been received by the ESD. A

resolution time is defined as the time required for a workaround or resolution to the problem reported to the ESD.

Tables 2 and 3 describe the relevant targets that IT Customers can expect from the IT Department. Responses targets indicate the time within which an IT Customer can expect to be contacted by the IT Department, once a request has been reported to the ESD. Alternatively, resolution targets specify the time in which an IT Customer can expect satisfactory resolution to a reported incident. These targets assist the IT Function in managing its customers' expectations.

Table 2 Response and Resolution Targets - during business hours

Priority	Response (Elapsed)	Resolution (Business hours)	Target
1	1 Hour	8 Hours	80%
2	4 Hours	3 Days	80%
3	1 Day	4 Days	80%
4	5 Days	As promised	80%

Source: (ABC Inc. IT Service Catalogue)

Table 3 Response and Resolution Targets - during non-business hours

Priority	Response (Elapsed)	Resolution (Business hours)	Target
1	1 Hour	8 Hours	80%
2 - 4	These requests have the same response and resolution targets as for local business hours. However, these calls take effect starting the next business day.		80%

Source: (ABC Inc. IT Service Catalogue)

The ESD function is currently being outsourced through a major outsourcing service provider. IT Customers in Canada and the United States are serviced through a call centre located in Toronto, Ontario. IT Customers in Paris are serviced through the above-mentioned outsourcing vendor's support centre in France.

The Service Level Objectives (SLOs) for the IT Department are shown in Table 4 as target levels of availability that customers can expect from the services provided by IT. As with the response and resolution times, the SLOs are conveyed through the IT Service Catalogue.

Table 4 depicts targets associated with the above-mentioned Service Level Objectives. These targets provide IT Customers with a reasonable expectation of the availability of a particular service. In other words, target service levels offer a promise of a specific service's uptime. These target service levels are another means to manage the expectations of IT Customers. The practicality of these SLOs and target service levels is explored in the analysis of internal characteristics of the ABC IT Function.

Table 4 Target Service Levels

Service	Availability During Local Business Hours*	Availability Outside Local Business Hours*
ANX/ENX Connectivity	99.0%	80.0 %
ERP	99.0%	80.0 %
E-mail - External	99.0%	80.0 %
E-mail - Internal	99.0%	80.0 %
Enterprise Service Desk	99.0%	80.0 %
File Sharing	99.0%	80.0 %
Financial Reporting	99.0%	80.0 %
Information Backup and Restore	99.0%	80.0 %
Internet Access	99.0%	80.0 %
Intranet	99.0%	80.0 %
Local Area Network	99.0%	80.0 %
PDM	99.0%	80.0 %
Print Services	99.0%	80.0 %
Project Resource Management	99.0%	80.0 %
Remote Access	99.0%	80.0 %
Security Management	99.0%	80.0 %
Telecommunications	99.0%	80.0 %
Video Conferencing	99.0%	80.0 %
Virus Protection	99.0%	80.0 %
Wide Area Network (Inter-networking)	99.0%	80.0 %
Workgroup Applications	99.0%	80.0 %
*Business Hours of Operation Monday to Friday 8:00 am to 5:00 pm local time Excludes disaster, environmental and planned outages		

Source: (ABC Inc. IT Service Catalogue)

2.4.2 *Products*

The IT Function supports various software applications and hardware throughout the organization. However, there are certain applications that ABC IT allows IT Customers to use but does not actively endorse. Software applications are managed according to the following criteria:

- **Allowed** – IT Customers may install the relative software applications but must support and maintain the software in accordance with IT policies and standards set by IT. IT does not provide support and service levels are not applicable under this category.
- **Supported** - IT provides full support and all service levels apply under this category.
- **Partnership** – IT provides support in partnership with IT Customers.

The supported software applications are divided into four categories: Workstation Applications, Engineering Applications, Workgroup Applications and Business Applications.

- **Workstation Applications** – Basic desktop applications for word processing and other basic office duties (see Table 5).
- **Engineering Applications** – Specific applications used by the various engineering teams throughout ABC (see Table 6).
- **Workgroup Applications** – Software used only by a few individuals or groups for highly specific purpose (see Table 7).
- **Business Applications** – Used by the various business functions (see Table 8).

Table 5 Workstation Applications

Type	Description	Version	Support
Operating System	Windows	2000	Supported
Operating System	Windows	95	Supported
Operating System	Windows	98	Supported
Operating System	Windows NT	4.0	Supported
Word Processing	Word	97	Supported
Word Processing	Word	2000	Supported
Spreadsheet	Excel	97	Supported
Spreadsheet	Excel	2000	Supported
Database	Access	97	Supported
Database	Access	2000	Supported
Presentation	PowerPoint	97	Supported
Presentation	PowerPoint	2000	Supported
Email/Calendaring	Outlook	97	Supported
Email/Calendaring	Outlook	2000	Supported
Desktop Publishing	Corel Draw	7	Allowed
Web Page Design	Front Page	98	Allowed
Project Management	Project	2000	Supported
Project Management	Project	98	Supported
PDF Reader	Adobe Reader	5.0	Supported
Zip	WinZip	8.0	Supported
Virus Protection	Trend Micro		Supported
Web Browser	Internet Explorer	ALL	Supported
Remote Access	AT&T Internet Access		Supported
Sales Management	Act	2000	Supported
Remote Access VPN	Nortel Connectivity		Supported
E-mail Encryption	PGP		Supported
Thin Client	Citrix		Supported
Thin Client	Terminal Services	2000	Supported

Source: (ABC Inc. IT Service Catalogue)

Table 6 Engineering Applications

Type	Description	Support
CAD/CAM/CAE	Pro/Engineer	Partnership
CAD/CAM/CAE	I-Deas	Supported
CAD/CAM/CAE	Eplan	Allowed
CAD/CAM/CAE	AutoCAD	Allowed
CAD/CAM/CAE	Catia	Allowed
CAD/CAM/CAE Management	Pro/Intralink	Partnership
CAD/CAM/CAE Visualization	VisPlus	Allowed
Process Modeling	Hysis	Allowed
Data Historian	InSQL	Partnership
HMI (Human Machine Interface)	InTouch	Partnership
HMI (Human Machine Interface)	Labview	Partnership
Mathematical Modeling	MathCAD	Partnership
Mathematical Modeling	Matlab	Partnership
Mathematical Modeling	Hanover	Allowed
Mathematical Modeling	Dyrobes	Allowed
Electronic Design Automation	Mentor-Graphics	Partnership
Technical Graphics/Illustration	Igrafx	Allowed
Technical Graphics/Illustration	Visio	Supported
Data Analysis/Reporting	DIAdem	Allowed
Data Analysis/Reporting	Freelance	Allowed
Process Simulation	AutoMod	Allowed
Process Simulation	Simul8	Allowed
Materials Reference	Cambridge Engineering Selector	Allowed
Finite Element Analysis	Ansys	Partnership
Finite Element Analysis	Nastran	Partnership
Finite Element Analysis	Patran	Partnership
Finite Element Analysis	Cosmos	Partnership
Finite Element Analysis	Abacus	Partnership
Computational Fluid Dynamics	Nastran	Partnership
Computational Fluid Dynamics	ICEM	Partnership
Computational Fluid Dynamics	Flotran	Partnership
Computational Fluid Dynamics	CFX-4	Partnership

Type	Description	Support
Computational Fluid Dynamics	CFX-5	Partnership
Statistical Analysis	Minitab	Partnership
Calibration	Engage	Partnership
Pressure Piping Code Stress Analysis	Autopipe	Allowed
Pressure Vessel Code Stress Analysis	Codecalc	Allowed

Source: (ABC Inc. IT Service Catalogue)

Table 7 Workgroup Applications

Type	Description	Support
Equipment Repair Tracking	TRS (Test Repair System)	Supported
Data Collection	ABC Conformus	Supported
Data Collection	PGen Conformus	Allowed
Data Collection	ABC Shop Floor Access Data	Supported
Training	E2K Pro	Supported
Electronic Funds	A/P Link	Supported
I.P. Management	Alecto	Supported
Utility	ADP/FS Upload	Supported
Utility	CIM Customizer (FS)	Supported
Utility	IR Treasury	Supported
Utility	Marketing Government Funding	Supported
Utility	QA COC	Supported
Utility (Shipping)	PGen RFS	Supported

Source: (ABC Inc. IT Service Catalogue)

Table 8 Business Applications

Type	Description	Support
Intranet	Net	Supported
Intranet	Espresso	Supported
Financial Reporting	Hyperion	Supported
PDM	Agile	Supported
PDM	E-Matrix	Partnership
ERP	SAP	Supported
ERP	Fourthshift	Supported
ERP	JD Edwards	Supported
Payroll	ADP	Partnership
Payroll	ADP	Supported
Project Resource Management	Enterprise Project	Partnership
Timesheets	BMP Timesheet	Supported
Timesheets	ABC Timecapture	Supported
Timesheets	ADP E-TIME	Partnership
Fixed Asset System	FAS	Partnership
Computerized Manufacturing Package	MP2	Partnership
Change & Version Control	PVCS Tracker	Partnership

Source: (ABC Inc. IT Service Catalogue)

Tables 5, 6, 7 and 8 portray the numerous applications that ABC IT is expected to administer. The tables also give an idea of the many relationships that the IT Function is expected to manage, as there are different customers for many of these applications. These tables serve as a basis for an analysis of the relationships between these products and the users of these products. This analysis is performed in an upcoming section, using a Product Customer Matrix.

This section offered a general background of ABC IT and its environment. Additionally, this section provided some detail of the products and services offered by ABC IT in an attempt to scratch the surface of IT's value to the ABC organization. The following sections further explore the relationship between the IT Function and the company, and give a detailed analysis of the value that the IT Function provides the company.

Additionally, these sections examine how the ABC organization perceives the value of the IT Function.

3 The Role of ABC IT

The following section will discuss the role that the IT Function plays in the ABC organization. It begins by assessing ABC's business strategy and how the company is shifting focus from a research and development organization to a customer-centric product company. The section then discusses ABC's sources of competitive advantage and the role that the IT Function plays in ABC's business. The analysis goes on to explain how ABC views the IT Function by describing the management of IT within ABC as well as the value that the IT Function creates for ABC. It explains the inefficiencies created by an internal market failure with respect to the IT Function. Next, the section considers the state of the IT Function in providing long-term competitiveness to the organization. The section concludes by looking at the decision to outsource the IT Function and the benefits that outsourcing provides the ABC organization.

3.1 ABC's Business Strategy - Changing Course

In 2003, ABC conducted an assessment of its overall business strategy (ABC, Inc 2003). The findings from this study were as follows:

- Current product pipeline is weak.
- Company is dependent on the success of unproven products in unfamiliar markets.
- No established distribution channels.
- Lack of significant cash inflows from operations - dependent on funding from partners and equity financing.
- No significant reduction of expenses.

In light of the aforementioned issues, ABC was faced with addressing the following questions:

- Could the company overcome barriers to the continued commercialization of its technology, specifically, product performance, organizational endurance, and excessive costs?
- Could the company maintain its technological advantage?
- Would partners continue the required financial support and could external financing be secured by 2004?
- Has continued investor support been jeopardized as a result of cancelled or deferred programs?
- Could new products take market share from established incumbents?
- Could the company justify a divisionalized structure with sharply lower volumes?

As a result of this strategic assessment, ABC created a revised plan to reduce the company's next generation research and current technology development spending. Additionally, the company is restructuring the organization to lower fixed costs. Efforts are being made to adapt current generation technology for hybridization and develop injection points for new technology. New projects are now more carefully rationalized. Outsourcing and partnerships with other organizations are being considered as opportunities to make technology development more efficient. Furthermore, ABC has eliminated its divisionalized organizational structure to flatten the hierarchy and broaden spans of control within the company. Product development has been consolidated as has manufacturing and supply chain operations.

The revised strategic plan is to reduce fixed costs and extend the life of existing capital. The company plans to reduce operating expenses by 25%-35%, reduce employee headcount by 25%-35%, and reduce capital spending by at least 50%. Existing ventures in new products and new markets are now very closely monitored. A set of evaluation criteria to terminate programs has been established.

ABC is making a conscious decision to concentrate on the development of higher margin products. The organization structure has been simplified and streamlined to consolidate technology and product development. Global sales and marketing offices with regional market focus are being established in Europe, Asia/Pacific, and the Americas. The company plans to deliver "best in class" products with exceptional service and support to its customers. ABC is also determined to establish itself as the "supplier of choice" for its technology. Moreover, the "cultural" integration of the companies acquired in 2001 with the parent company is to be completed. The company chose to begin development work on the next generation technologies necessary for continued growth. ABC is now changing its business strategy to transform the company from a technology-focused research and development organization to a customer-focused production organization.

3.2 ABC's Source of Competitive Advantage

The IT Function is not a source of ABC's competitive advantage. To understand the role that IT plays in ABC's sources of competitive advantage it is necessary to examine what the sources of competitive advantage are for ABC. Porter (1980) contends that an analysis of the individual parts of an organization within its supply chain can identify potential for value-creation and competitive advantage. Porter also suggests that this analysis should, preferably, be conducted using the value chain.

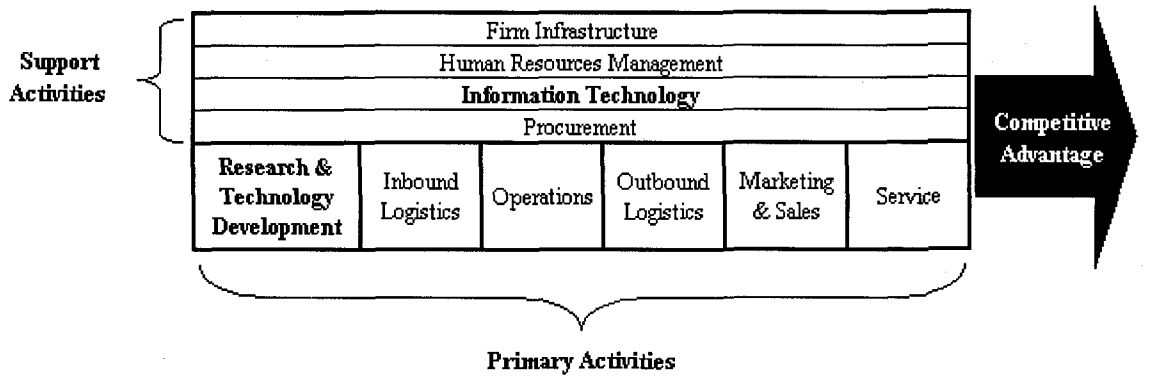
The value chain concept divides the activities that ABC performs in conducting its business into technologically and economically distinct activities (value activities). To gain a competitive advantage, a company needs to execute these activities at a lower cost or in a manner that achieves differentiation and a price premium. ABC chooses to compete on the basis of the lowest-cost provider as evidenced by the company's mission statement:

> ABC will be the leading supplier of high quality, low cost products,
> creating superior value for customers, shareholders, and employees.

A previous section explains ABC's history as a research and development organization. At the present time, ABC is trying to develop competencies as a customer-oriented production company. In this regard, Operations, Sales and Marketing, and Service will

play an integral role as sources of competitive advantage. Figure 1 portrays the value chain for the ABC organization.

Figure 1 ABC Value Chain



Source: (Modified from Porter, 1985)

Primary activities are those functions associated with the physical creation of ABC's products; delivery to the customers of its products; and the subsequent support and servicing of these customers. For ABC, these primary activities include research and technology development, operations, inbound and outbound logistics, marketing and sales, and service.

For ABC, inbound logistics incorporate those functions that obtain, receive, store, and provide the right quality and quantity of inputs and resources to the business. Operations comprise the functions that transform the inputs into the products and services required by ABC's customers. Outbound logistics encompass the functions that distribute the ABC's products directly to the customer or through appropriate distribution channels.

Some of ABC's rivals in the industry have a strategic competitive advantage in terms of economies of scale and extensive manufacturing, marketing and sales capabilities. ABC competes from its position as a technology leader and through the company's patents and strong intellectual property position. Accordingly, research and technology development are ABC's main sources of competitive advantage.

Support activities are those functions that provide the foundation and infrastructure required to accomplish the primary activities. Along with activities such as human resource management, and firm infrastructure (general management, accounting, legal, etc), ABC considers the IT Function as a support activity. In a later section, this analysis describes the role of IT as a support activity. Additionally, the analysis shows the value that the IT Function creates for the organization. The following section depicts ABC's management of IT and the company's recognition of IT's importance to corporate strategy.

3.3 ABC's Management of IT - Business and IT Governance

Corporate governance is typically concerned with issues such as control, accountability, sustainability, corporate health, organizational structure, and processes to develop, implement, and monitor corporate strategy (Kakabadse and Kadabadse, 2001). Similarly, "[IT] governance assists in the achievement of corporate success by both efficiently and effectively deploying secure and reliable information through the application of technology" (Kakabadse and Kadabadse, 2001, p. 9).

ABC acknowledges the link between business and information technology governance and recognizes the importance of information technology as an enabler of corporate strategy. Furthermore, as Lainhart (2000, p. 40) posits, the presence of certain factors necessitates the need for an effective and interdependent system of enterprise and IT governance within the ABC organization. Specifically, these factors are:

- Increasing dependence on information and the systems that deliver the information;
- Increasing vulnerabilities and a wide spectrum of threats;
- Scale and cost of current and future investments in information and information systems; and
- Potential for technologies to dramatically change the organization and business practices, create new opportunities, and reduce costs.

Correspondingly, in January 2003, the ABC Business and Information Technology Strategy Council was formed to address the issue of IT governance at ABC. The council's mandate is to ensure the alignment of information technology investments with business strategy. The IT Function cannot make effective IT-related strategic decisions without an enterprise-wide business perspective.

The council is positioned at the highest level of the organization. It consists of members of the Executive team and represents the major operational users of IT services in ABC. The council is comprised of the VP Operations, Chief Financial Officer, VP Human Resources, Chief Technology Officer, VP Sales and Marketing, and the Director of Information Technology.

The goal of the council with respect to IT governance is to:

- Ensure that a viable IT strategic plan is in place.
- Provide enterprise-wide guidance for information technology investments and strategy.
- Approve, annually, a three-year 'Information Technology Roadmap' that forecasts the technology investments that will be required to support planned business initiatives and priorities.
- Review and approve annual IT operating budgets before submittal to the Board of Directors.
- Review and approve annual IT capital budgets derived from the IT Strategic Plan and IT Roadmap.

The formation of the ABC Business and Information Technology Strategy Council signifies the emphasis that the ABC Executive places on the relationship between business and information technology. The company is cognizant of IT's role as an enabler of corporate strategy. As suggested by Ross et al (1996, P. 31), a partnership between IT and business management is one of the keys "to generate sustainable competitive advantage through information technology."

3.4 The Value of the IT Function at ABC

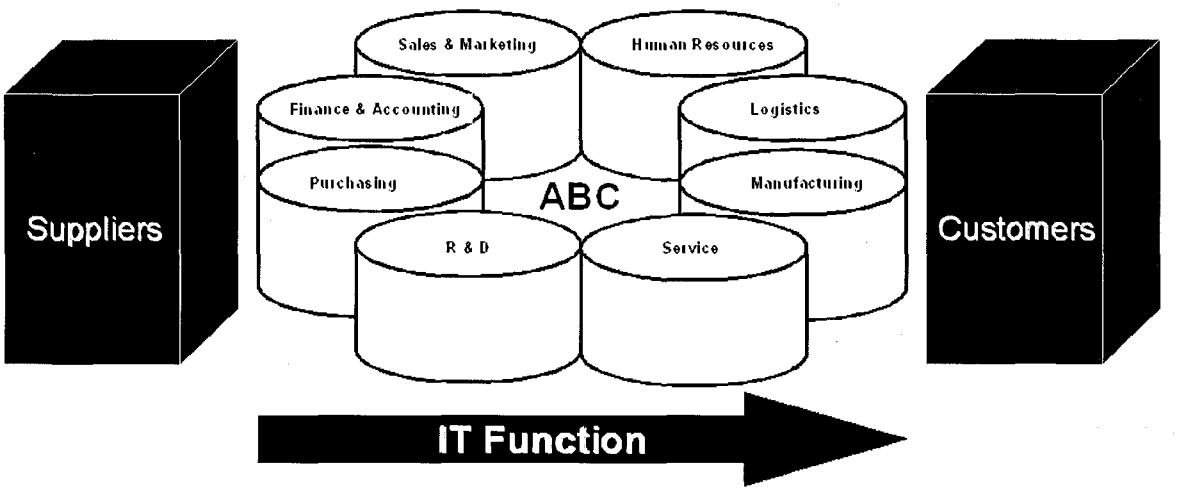
In the previous section on business and IT governance, we see the importance that the ABC Executive places on the function of IT within ABC. ABC regards the IT Function as an enabler of corporate strategy and emphasizes the strategic alignment of business and IT. Nevertheless, IT is seen as a support activity and not a source of competitive advantage. While IT is not a core capability for the ABC organization, the organization can better appreciate the role that the IT Function has in the search for competitive advantages. This section discusses the value that the IT Function has within the ABC organization on two fronts. Firstly, the section explores the role that IT plays in the business of ABC. Secondly, the analysis looks at IT and the internal market within ABC.

3.4.1 The Value of IT to the ABC Business

The contributions of the IT Function to the organization are obscured by ABC's view of the role of IT in achieving competitive advantage. The value chain concept provides significant limitations in assessing the true value of the IT Function to ABC (Bahn, 2001, p. 29). ABC's view of the IT Function is consistent with Porter's (1985) original conception of the value chain. That is, IT is an administrative support activity not a primary revenue-generating activity on the firm's value chain (Bahn, 2001, p.29-30).

ABC considers the IT Function as a net cost to the organization. The company perceives IT as adding value "only in the context of adding value directly to a firm activity that is a primary component of the value chain" (Bahn, 2001, p. 30). This seems to be a limiting factor in assessing IT's value to the organization. The value of the IT Function is measured in relation to a primary value chain activity, such as Sales and Marketing, in isolation from other primary value chain activities, like Research and Technology Development.

Figure 2 IT and the Internal ABC Supply Chain



Source: Author

Figure 2 shows that the IT Function provides support to the entire ABC organization. IT associates with every activity in ABC's value chain and affects the relationships between different value activities. The IT Function strengthens the firm's operations by integrating and coordinating value chain activities across the global business operation. ABC IT provides the applications, support and infrastructure that allow the exchange of information across separate value chain activities including research and technology development, ABC's core competency. In this regard, the IT Function integrates and consolidates distinct primary and support activities. The resulting gains in efficiency and effectiveness translate into the value that the IT Function provides the ABC organization.

3.4.2 Failure of ABC's Internal IT Market

The IT Function trades its products and services with the rest of the ABC organization. Thus, ABC IT is part of the internal market within the firm. "Theoretically, one would...expect an efficient internal market for...goods supplied...within the firm, so that receiving co-workers pay a 'price', which may be in units of exchange other than money, equal to the ... opportunity cost of the goods" (Vining, 2003, p. 432). In regards to the IT Function, ABC is not an example of an efficient internal market. That is, with

respect to the IT Function, the ABC internal market is subject to failures that result in inefficiencies.

Vining (2003, p. 433) posits that there are five major categories of internal market failures that are most relevant to organizations. In ABC's case, an internal market failure emanates from the failure to supply the internal public good of Information Technology. This section explains this category of internal market failures, specific to the ABC organization and the ABC IT Function.

The goods provided by the IT Function have two characteristics that categorize IT products and services as internal public goods: the degree of rivalry and the degree of excludability. The degree of rivalry regarding IT products and services is the extent to which what one IT Customer uses can also be used by other customers of IT. On the other hand, the degree of excludability in relation to IT products and services is the extent to which an IT Customer has control over a particular IT offering.

ABC IT products and services ("IT Goods") are non-excludable, in terms of internal transaction costs, as it is impractical to maintain exclusive control over the use of IT products and services. For example, IT Customers cannot be excluded from receiving benefits from the use of the company intranet. The lack of excludability creates internal inefficiencies for the IT Function as it is forced to provide IT Goods to IT Customers even when the marginal cost of providing these products and services is not equal to zero. IT Goods are also non-rivalrous. IT Goods comprise products and services that are non-rivalrous in that more than one IT Customer derive benefit from the use of the particular product or service. For example, the ABC intranet has a non-rivalrous characteristic in that many IT Customers can simultaneously use the advantages of the above-mentioned intranet without affecting other users.

This degree of non-rivalry of IT Goods is somewhat problematic in that each IT Customer may value or benefit from the use of the IT Goods differently. Valuations of individual IT Customers do not tell the IT Function how much of a non-rivalrous good is optimal for the ABC organization. IT Customers cannot, for the most part, be excluded from the use of IT Goods. As such, they are not compelled to honestly reveal how much they value the chosen output level of IT products and services. This results in

inefficiencies "because once a given level of output of [IT Goods] is provided all [IT Customers] receive that level" (Vining, 2003, p. 434). As IT Goods are both non-rivalrous and non-excludable, they are considered public goods. "At the limit, all [IT Customers] benefit from [the effort of the IT organization] and none can be excluded from these benefits" (Vining, 2003, p. 436).

IT within ABC is considered an internal public good. As such, IT provides products and services at a sub optimal supply. In some cases, IT offers IT Goods that are not even used by IT Customers. In other cases, the IT Function provides IT Goods that are extremely beneficial to IT Customers, but at a cost to the IT organization, not IT Customers. This is extremely inefficient and contributes to the failure of the internal market within which IT operates. As such, the IT Function needs to change the way in which IT products and services are viewed within the ABC organization. ABC IT can alter this perception by ceasing to be an internal public good.

3.5 The IT Function and the Long-Term Competitiveness of ABC

Seeing that IT is not considered a source of competitive advantage, ABC has to remain cognizant of IT's value in enhancing the firm's competitiveness. Ross et al (1996) tackle the question of how IT can increase an organization's competitiveness by suggesting, "the answer lies in the development of an especially effective IT capability."

While ABC may not choose to make the IT Function a source of competitive advantage, the company needs to remain cognizant of its dependency on information. There is the likelihood that an ABC competitor develops an IT application that becomes a necessity for competition. ABC would then require an IT capability to deliver and support this application quickly and cost effectively (Ross et al, 1996, p. 39).

Ross et al maintain that the IT Function, in conjunction with the nature of a firm's competitive environment, plays a significant role in ensuring the long-term competitiveness of an organization. That is, whether ABC faces immediate competitive threats or whether it dominates its competition effects whether the IT Function is of any competitive value.

Table 9 Competitive Assessment Grid for the ABC IT Function

	Competitive Environment	
Strength of IT Function	**Immediate Threat**	**No Immediate Threat**
Weak	**Sinking** *Start bailing* Rapid, risky change	**Drifting** *Set a course* Relationship building
Strong	**Luffing** *Trim the sails* Focused response	**Cruising** *Go full speed ahead* Adaptive learning

Source: (Modified from Ross et al, 1996, p. 39)

Table 9 assists in assessing the competitive value of ABC's IT Function. ABC does not face any immediate threat from its competition, primarily due to its technology lead and protected intellectual property position. At the same time, the strength of ABC's IT Function is weak, as described in the analysis of internal characteristics of the IT Function. Thus, the competitive nature of the ABC IT Function is in the Drifting quadrant of Table 9.

Although ABC has time to recover, the weakness in the IT Function, can easily pose a threat to the firm's long-term competitiveness. In nautical terms, the IT Function is 'drifting', and needs to set a strategy. At the present time, IT may not contribute to the organization's competitiveness. However, the ABC Executive and the IT Function must work closer together to ensure that the IT Function can enable strategic priorities for the ABC business. ABC can continue to disregard the IT Function as a competitive competency as long as the IT Function does not become a competitive liability.

3.6 Choosing to Outsource the IT Function

ABC IT currently outsources the Enterprise Service Desk service of the customer support function. However, an opportunity exists to outsource others parts of the current IT Function. Moreover, the organization faces the issue of whether or not to outsource the IT Department, at all.

The current environment offers many reasons to consider outsourcing to an external service provider or outside vendor. Rising IT costs, rapidly changing technology, and inadequate customer service provide motivations for the outsourcing decision.

The IT Function at ABC faces financial constraints due to a shrinking budget and a pressure to reduce IT-related costs. Outsourcing IT allows ABC to reduce costs associated with providing IT services to the organization. Vendors are typically able to lower the cost of IT services through the benefits of economies of scale.

The IT Function currently faces risks associated with large capital investments, rapidly changing technology, maintenance, and hardware and software obsolescence. Outsourcing allows for the transfer of risk to the external service provider; thereby providing an additional reason to outsource.

Also, ABC IT has many issues with respect to providing quality customer service to the internal customers of the ABC organization. The decision to outsource can improve internal customer service because the vendor usually has employees with a wider range of skills sets, who are knowledgeable about current and leading-edge technologies (Powell, 2001, pp. 138-139).

For ABC, core competency theory contends that activities that are not core competencies be considered for outsourcing. From the analysis in the previous sections, it is clear that the ABC IT Function is not a core competency of the organization. As such, the decision to outsource IT is an opportunity that faces the organization. While the outsourcing of IT remains an opportunity for the ABC organization, it poses a threat to the IT Department. The IT organization needs to recognize the threat provided by a decision to outsource either some or all aspects of the IT Function.

4 Analysis of Internal Characteristics of the IT Function

The current structure and operating practices place the IT organization in a position to fall short in the efficient planning and delivery of IT services. The effects of the issues, discussed in the first section, will be apparent during the internal analysis that follows in this section. The analysis of internal characteristics augments the discussion on the IT organization's environment within ABC and seeks to provide an introspective analysis of the major factors affecting ABC IT.

It is important to consider the internal analysis of the IT Function from a perspective of strengths and weaknesses. This analysis will also be broad in scope. In this regard, this analysis will focus on the following major areas:

- Products
- Personnel
- Organizational Structure
- Financial Constraints
- Management

The upcoming sections explore these five points in further detail.

4.1 Product Analysis

The product analysis shows that IT Function is unable to quantify the benefits of its product offering to the organization. This inability results in a failure to provide the greatest value to IT Customers. This will be shown in an analysis of the two components that make up the IT product list, physical assets and services. The greatest value for IT Customers refers to the need for the product or service to be both low cost and high quality. While low cost and high quality cannot both be satisfied entirely, the

optimization of the trade-off between low cost and high quality is what this analysis refers to as the greatest value.

Physical assets are the tangible assets, such as hardware and software that are consumed by IT Customers. Services are comprised of activities performed by the IT Function, in supporting these physical assets, in an effort to provide added value to the organization.

4.1.1 Physical Products Analysis

The physical portion of the product offering, physical assets, is inundated with financial management issues. Along with a lack of strong links to the internal business community, funds are not appropriately allocated to the products that provide the greatest value to ABC. To understand the shortcomings of the physical product component, one has to consider the make-up of this part of the product offering and the method in which these products are managed. This section breaks down the physical assets into the following classifications:

- Desktop hardware
- Infrastructure hardware (such as storage, servers, switches and cabling)
- Software licenses

This section explores the management of these physical assets. The section follows with a detailed explanation of these physical assets and their respective merits.

Physical Asset Management

To understand the gaps in value provided by the IT Function, it is necessary to understand how the budget for physical assets is allocated. Until recently, the physical assets of IT were purchased from the budget allocated to the IT Function. Recent management changes have brought a cease to this practice for purchases of desktop hardware and for the procurement of new infrastructure hardware (storage). These types of purchases are now being considered as departmental or project-specific capital expenses, or in other words, a part of a project or particular department's budget. The purchase expense of all other physical assets, including hardware replacement, is

attributed to the IT organization. This is a major consideration for the IT Function as it impacts its ability to successfully manage its costs and provide value to the organization over the long term. The following sections describe the current model in further detail. The section concludes with a discussion of the issues relating to each class of physical asset.

Hardware Asset Management

Two years ago, a new Director of Information Technology assumed control of ABC's IT operations. Under this management, a model was adopted that deems hardware purchases as capital expenditures. Furthermore, charges for the hardware purchases are now charged to the specific department or project that initiated the request. For infrastructure-related hardware, capital purchases include support costs that cover three years of the life of the hardware. However, IT is constrained by a policy that only allows the hardware to be replaced every five years. Thus, IT is forced to assume any support costs that may be required in the final two years of the life of a piece of hardware. These additional support costs are attributed directly to the IT budget. Moreover, the capital cost of replacing this hardware becomes the responsibility of the IT organization. The project or department that initially purchased the hardware is then absolved of any further financial responsibility relating to the original purchase.

As depicted in Table 10, ABC experiences significant cost savings as a result of shifting the financial burden of desktop hardware purchase to the department or project level. Departments and projects are cost conscious. Having the costs of these purchases and upgrades effect departmental or project bottom-lines forces all managers to more carefully scrutinize these expenses. The IT Function is still involved in the procurement process and assists in the selection of goods to be purchased. This central role allows IT to seek economies of scale by purchasing multiple systems for a variety of departments. By creating this charge back relationship for desktop hardware, IT, as well as the ABC organization, has experienced a great reduction in capital cost expenditures.

Table 10 Desktop Hardware Purchasing Trends

Desktop Type	Unit Purchases 2001	Unit Purchases 2002	Unit Purchases 2003
Desktop PC	147	50	9
Laptop PC	56	22	10

Source: Author (Data from ABC IT Budget Spending)

IT avoids the initial capital costs associated with infrastructure-related hardware systems. This expenditure is allocated to the corporate budget. Additionally, IT does not have to be concerned with the first three years of support and maintenance that is provided by the hardware vendors. Nevertheless, IT still faces the fact that many of these systems are approaching the end of their three-year support and maintenance agreements, as shown in Table 11. This implies that, in the face of a shrinking budget, IT is forced to incorporate the cost of supporting these hardware systems for the remaining two years of useful life. At this time, IT bears the large cash outlays required for hardware replacement.

Table 11 Life Span of Infrastructure Machines

	2004			2005			2006			2007		
Server age in years	0-3	4-5	>5	0-3	4-5	>5	0-3	4-5	>5	0-3	4-5	>5
Number of servers	57	37	16	17	71	22	6	52	52	0	17	93
Cost to Maintain ('000s)	0	111	48	0	213	66	0	156	156	0	51	279

Source: Author

The management of hardware assets has moved towards a charge back model; however, IT still fails to recoup reimbursement for all the expenses over the lifetime of the hardware use. The declining budget and ongoing expenses associated with the hardware continues to pose a burden on the IT Function.

Software Asset Management

Software asset management follows a different model than that of hardware. Software licenses are purchased and supported by IT. IT supports a broad range of software licenses so as to avoid constraining the development teams. Rather than limiting the number of software types, IT monitors the range of software variety. If one variety of a software product is purchased by IT, those development teams wishing to use another variety are expected to bear the financial weight of the purchase. Additionally, IT will not provide support services for this new software. For example, there are two predominant engineering design tools in the market: Pro Engineer and Auto CAD. Pro Engineer has been selected as the product of choice for ABC's engineering department. Those projects wanting to purchase and use Auto CAD are responsible for all the licensing and support costs.

The IT Function offers a bundle of packages to the whole organization. This practice reduces the variety of products that ABC IT needs to support and creates economies of scope. Most IT Customers choose to use the products that are supported by the IT Function rather than justifying the expense of another application. The IT Department is flexible, however, and will consider supporting other software products if the need can be justified. This method of new product screening has proven to work well for the IT organization.

Nevertheless, the IT Function does not have a method for determining which products should no longer be supported. The problem stems from the lack of a clear understanding of the value that each product provides the customers of IT. Moreover, the IT Department is unable to associate the product with the product's users. As departments or projects are not currently financially accountable for software, the motivation to reduce the scope of products is non-existent. As such, obsolete or low value applications continue to be supported.

A similar problem exists for the addition of new software. There is no formalized process for investigating the benefits of software that is not demanded by departments or projects. That is, there is no system to add additional software unless a customer of IT specifically requests the application. Although the IT Function supports the whole

organization, it does not have the resources or channels to conduct such proactive investigations. Consequently, new technologies or software applications, that could reduce costs or increase efficiencies for the ABC organization, are not brought forward. This is a major shortcoming of the IT Function.

The scope of software demanded by IT Customers is very well managed. However, there are no sufficient processes in place to ensure that the total software offering provides the greatest value to the ABC organization, as a whole.

Physical Product Offering

In addition to asset management, it is important to analyze IT Function's product offering. This section analyzes the current set of products with two goals in mind:

1. To reduce scope.
2. To provide more value.

IT currently attempts to offer a broad selection of products. However, the IT Function should only be providing products that supply the greatest value. It is this value that should dictate the breadth of products offered. The first goal, the reduction of scope, will be covered in the next section. The second goal is covered in the section explaining the Product Customer Matrix.

Product Standardization

Standardization is an easy way to reduce scope and create cost savings. "Standards limit the range of technologies that IT staff must support, enabling them to provide faster, more cost-effective support" (Ross et al, 1996, p 34). Until recently, ABC believed the lack of standardization was acceptable and not worth the investment to implement a change. This has been proven false. Currently, as a result of expansion through acquisition, ABC's technology consists of three legacy systems. In many instances, these systems are not integrated; thus, the IT Department has had to create manual workarounds. These workarounds create inefficiencies. Lack of technology standards reduces efficiencies and the organization's ability to capitalize on economies of scale.

The major technology standardization obstacle results from the ERP system. Specifically, Canada, France and the US each use their own ERP systems: Fourthshift, SAP and J.D. Edwards, respectively. The three systems lack integration. This has hindered the rapid seamless communication of business information throughout the organization. As such, the ABC Executive has endorsed a project proposal detailed in the IT Solutions Roadmap. The IT Solutions Roadmap was created with a three-year migration plan to SAP. SAP will become the technology application standard across the global operation for ERP and many other business solutions.

In addition to standardization through SAP, there will also be version standardization. Table 5 shows a wide variety of versions of Windows and other workstation applications currently supported by ABC IT. A reduction in economies of scope results from the IT Function's support of the many varieties of applications. ABC IT is currently implementing a policy to standardize these applications. Table 12 shows the future list of standardized, supported workstation applications. This list reduces the number of workstation applications provided by the IT Function. In addition to not having to support as many applications, desktop set-up is also standardized. This allows for patches and upgrades to be automatically and remotely applied throughout all ABC locations without the need to consider system and version relationships. A single individual could perform system-wide upgrades at one time, from a single location. Standardization allows IT to capitalize on the scale economies possible across such a large organization.

Clearly, the result of standardization is the reduction in costs as more users use each product. This standardization creates economies of scale, much needed in an organization trying to reduce expenses. Under the new system, maintenance and other support services will be streamlined, creating cost savings. This paves the way for a more centralized support organization. The section on organizational analysis provides a study of the organizational changes that can occur through the process of standardization.

Table 12 List of New Workstation Applications

Type	Description	Version
Operating System	Windows	2000
Operating System	Windows NT	4.0
Word Processing	Word	2000
Spreadsheet	Excel	2000
Database	Access	2000
Presentation	PowerPoint	2000
Email/Calendaring	Outlook	2000
Desktop Publishing	Corel Draw	7
Web Page Design	Front Page	2000
Project Management	Project	2000
PDF Reader	Adobe Reader	5.0
Zip	WinZip	8.0
Virus Protection	Trend Micro	
Web Browser	Internet Explorer	ALL
Remote Access	AT&T Internet Access	
Sales Management	Act	2000
Remote Access VPN	Nortel Contivity	
E-mail Encryption	PGP	
Thin Client	Citrix	
Thin Client	Terminal Services	2000

Source: Author

Product Customer Matrix

As mentioned previously, the task of determining which technology to support and which technologies provide the greatest value is hindered by a lack of clear understanding of the customer. Product Customer Matrices (PCMs) of physical products have been created to develop an understanding of the relationship between products and customers. The PCMs are listed in tables 13, 14, 15, and 16. Products are divided into four categories: Workstation Applications, Engineering Applications, Workgroup Applications, and Business Applications. The lists of applications are taken from Table 5,

Table 6, Table 7 and Table 8, respectively. These tables include only the applications that are supported, alone or in partnership, by IT.

Table 13 Product Customer Matrix - Workstation Applications

	Customers by Location and Department																							
	Winnipeg						Paris						Miami						Dallas					
Workstation Applications	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C
Database Access 2000													•	•	•	•	•	•						
Database Access 97																								
Desktop Publishing Corel Draw 7																								
E-mail Encryption PGP																								
Email/Calendaring Outlook 2000	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Email/Calendaring Outlook 97	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Operating System Windows 95	•	•	•	•	•	•							•	•	•	•	•	•	•	•	•	•	•	•
Operating System Windows 98	•	•	•	•	•	•							•	•	•	•	•	•	•	•	•	•	•	•
Operating System Windows NT 4.0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
PDF Reader Adobe Reader 5.0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Power Archiver							•	•	•	•	•	•												
Presentation PowerPoint 2000	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Presentation PowerPoint 97	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Project Management Project 2000	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Project Management Project 98	•	•	•	•	•	•							•	•	•	•	•	•	•	•	•	•	•	•
Remote Access AT&T Internet Access	•	•	•	•	•	•							•	•	•	•	•	•	•	•	•	•	•	•
Remote Access VPN Nortel Connectivity	•	•	•	•	•	•							•	•	•	•	•	•	•	•	•	•	•	•
Sales Management Act 2000				•																				
Spreadsheet Excel 2000	•	•	•	•	•	•							•	•	•	•	•	•	•	•	•	•	•	•
Spreadsheet Excel 97	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Thin Client Citrix		•	•	•	•		•	•	•	•	•	•	•	•			•							
Thin Client Terminal Services 2000				•	•									•										
Virus Protection Trend Micro	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Web Browser Internet Explorer ALL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Windows 2000	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Word Processing Word 2000	•	•	•	•	•	•							•	•	•	•	•	•	•	•	•	•	•	•
Word Processing Word 97	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Zip WinZip 8.0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

H Human Resources P Product Development O Operations
F Finance/IT S Sales & Marketing C Corporate Dev

Source: Authors

Table 14 Product Customer Matrix - Engineering Application

	Customers by Location and Department																							
	Winnipeg						Paris						Miami						Dallas					
Engineering Applications	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C
CAD/CAM/CAE I-Deas															•									
CAD/CAM/CAE Management Pro/Intralink			•																					
CAD/CAM/CAE Pro/Engineer			•									•			•									
Calibration Engage			•		•										•			•						
Computational Fluid Dynamics CFX-4			•																					
Computational Fluid Dynamics CFX-5			•																					
Computational Fluid Dynamics Flotran			•												•									
Computational Fluid Dynamics ICEM			•																					
Computational Fluid Dynamics Nastran			•																					
Data Historian InSQL			•		•																			
EDA Mentor-Graphics															•			•						
Finite Element Analysis Abacus																								
Finite Element Analysis Ansys			•																					
Finite Element Analysis Cosmos																								
Finite Element Analysis Nastran			•																					
Finite Element Analysis Patran			•																					
HMI (Human Machine Interface) InTouch			•		•										•			•						
HMI (Human Machine Interface) Labview			•		•							•												
Mathematical Modeling MathCAD			•									•												
Mathematical Modeling Matlab			•									•												
Statistical Analysis Minitab			•		•										•			•						
Technical Graphics/Illustration Visio												•			•			•						

H Human Resources P Product Development O Operations
F Finance/IT S Sales & Marketing C Corporate Dev

Source: Author

Table 15 Product Customer Matrix - Business Applications

	Customers by Location and Department																							
	Winnipeg						Paris						Miami						Dallas					
Business Applications	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C
Version Control PVCS Tracker			•																					
Computerized Manufacturing MP2					•																			
ERP FourthShift		•	•	•	•															•		•	•	
ERP JD Edwards														•		•	•							
ERP SAP				•			•	•	•	•	•	•												
Financial Reporting Hyperion	•	•	•	•	•	•								•										
Fixed Asset System FAS		•												•										
Intranet Espresso													•	•	•	•	•	•						
Intranet Net	•	•	•	•	•	•	•	•	•	•	•	•							•	•	•	•	•	•
Payroll ADP	•	•												•						•				
Payroll							•	•	•	•	•	•												
PDM Agile	•	•	•	•	•	•																		
PDM E-Matrix							•	•	•	•	•	•												
PRM Enterprise Project			•	•	•																			
Timesheets ADP E-TIME													•	•	•	•	•	•						
Timesheets BMP Timesheet																			•	•	•	•	•	•
Timesheets ABC Timecapture	•				•																			

H Human Resources P Product Development O Operations
F Finance/IT S Sales & Marketing C Corporate Dev

Source: Author

Table 16 Product Customer Matrix - Workgroup Applications

	Customers by Location and Department																							
	Winnipeg						Paris						Miami						Dallas					
Workgroup Applications	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C
Equipment Repair Tracking			•																					
Data Collection					•																			
Training					•																			
Electronic Funds		•																						
IP Management						•																		
Utility ADS/FS Upload		•																						
Utility CIM Customizer					•																			
Utility IR Treasury						•																		
Utility Marketing Government Treasury				•																				
Utility QA COC					•																			
Utility Shipping				•	•																			

H Human Resources P Product Development O Operations
F Finance/IT S Sales & Marketing C Corporate Dev

Source: Author

These Product Customer Matrices provide "an initial 'snapshot' of [IT's] products and customers and the connection between the two" (Boardman and Vining, 1996, p. 38). These matrices traditionally provide the basis required to answer the following questions:

- What are the products actually provided by IT?
- Who are the customers that use these products?

Armed with the answers to these questions, the IT Department can approach the customers of these products to determine the value derived from their use of the products. These particular PCMs convey a product-customer linkage, but do not offer a clear picture of what these products are worth to the customers of IT. However, these linkages do provide a manner in which to determine the value of these products to customers.

The Product Customer Matrices also show which specific products particular customers do not use. Some products appear to not be consumed by IT Customers at all. There is reason to believe that users of certain products are, in fact, unknown to the IT service providers. The PCMs also show that some applications are used in some ABC offices while other ABC locations do not use the applications altogether. In either case, the situation poses a dilemma for the IT organization. Using the PCMs, IT can work with their customer to determine the value derived from the use of each specific products provided by the IT Function.

At this time, the physical product offering does not provide the greatest possible value. Product standardization shows signs of providing benefits to the issue of product scope; however, more effort is needed to ensure improvements in the value of products offered. The product offerings should continue to be limited by product scope. Nevertheless, the product selection needs to be based on the greatest value. To determine this value, links need to be established with the customers of IT. PCMs are a good first step in understanding the customer and value of the product.

In summary, the following are the three main issues concerning IT's management of the aforementioned physical assets:

- Capital and support costs are borne by IT following the three year life of the hardware;
- Lack of a process for reducing product scope;
- Lack of pro-activity by IT to work with business units to determine and recommend which products provide the greatest value.

These three issues affect the way in which IT can successfully manage costs and add value to ABC.

4.1.2 Service Product Analysis

This section will show the inefficiencies in the service component of the product offering. The focus for ABC IT has been on running the department as a support operation rather than a service operation. As such, the current service offering is missing value-added services. Furthermore, the support service wastes efforts by maintaining unrealistic service availability. At the same time, there is no clear commitment to reasonable service level agreements.

The following section analyzes the management of the portfolio of services offered by ABC IT. An analysis of the Service Customer Matrix follows.

Service Offering Analysis

Section 2 outlined a detailed description of services. This section, however, groups the service offerings into more general categories as depicted in Table 17. The section elaborates on the service offerings and comments on how management allocates resources to each service (depicted in the table as percentages) in relation to its value to the ABC organization. This part also explores target service level objectives, as outlined in Section 2, and the management of these service levels.

Table 17 Service Offerings Value

Service	Operations Function*	Customer Support Function*	Business Solutions Function*	Average Total*	Value of Service to ABC
New Purchases	5%	10%	0%	5%	Low
Customer Support	15%	80%	45%	45%	Medium
Daily Operations	40%	0%	15%	20%	Low
Upgrade, Replacement	10%	10%	0%	5%	Low
New Technology Opportunities	0%	0%	0%	0%	High
New Solutions	10%	5%	20%	10%	Medium
Proactive Resolutions	15%	0%	10%	10%	High
Administration	5%	5%	10%	5%	Low
*** Time Allocation** - Values are percentage of time estimates for each function within the IT Department. Data from records maintained by function management					

Source: Author

New Purchases

When an IT Customer wishes to make a new hardware or software purchase, this customer makes a request through the IT Department. Although the customer is charged for the hardware, the ancillary costs associated with servicing each request are attributed to the IT Department. These ancillary costs include support, maintenance, replacement and disposal.

As shown in Table 17, a considerable amount of resources is allocated to support, maintenance, replacement, and disposal services. What is concerning is that these services provide very little to the ABC organization in the form of value. Nevertheless, services like new purchases normally provide an opportunity to build links with IT

Customers. At ABC, the Enterprise Service Desk fields the initial request for new purchases. Because the ESD function is outsourced, the opportunity to build relationships with customers of IT is lost.

Once IT receives the request from the ESD, a number of IT personnel may need to get involved to process this request. The request dictates which IT personnel handle the call as each request may require a specific skill-set. The opportunity to build a rapport with IT Customers is missed, as there is no initial point of contact within ABC to develop this relationship.

Customer Support

The primary function of the IT Department is Customer Support. The majority of most IT personnel's time is divided between support calls and daily operational activities. Support activities are split into two groups: Basic and Advanced. The following list provides a description that will assist in better understanding these groupings and the order of operations with respect to support calls.

1. **Enterprise Service Desk –** A customer calls the Enterprise Service Desk with an issue. The ESD attempts to resolve the issue. If the ESD is unable to provide a resolution within 10 minutes, an incident report is submitted to the Basic Customer Support Team.
2. **Basic Customer Support –** The incident resolution is now the responsibility of the customer support analysts of the Customer Support Team. If the issue is still not resolved, the issue is escalated to a member of the IT Department with the appropriate expertise and specialization.
3. **Advanced Customer Support –** Technology specialists work to rectify the issue until it is resolved.

The current manner in which Customer Support is managed requires time and resources that could otherwise be more effectively allocated. The reasons for this are twofold. Firstly, there are no Service Level Agreements (SLAs) between IT Customers and the IT Function. Secondly, the IT Department has made customer support the department's primary focus.

The IT Function conveys its Service Level Objectives (SLOs) through the IT Service Catalogue. The catalogue details product and service availability and ESD response times. SLOs differ from SLAs in that SLOs are not contractual agreements with customers. Current SLOs are addressed through the IT Service Catalogue via the ABC Intranet and so, SLOs are not actively communicated to IT Customers other than through the ESD. Furthermore, SLOs do not provide the IT Function with a sufficient means to measure the level of performance. Instead, performance is measured through customer satisfaction surveys.

Presently, the performance goal of the IT Function is to achieve high satisfaction ratings from the customers of IT. IT Customer surveys are conducted to gauge the opinions and feelings of IT Customers. According to Peppard, these surveys may be conducted in vain.

> "[Customer satisfaction surveys] raise the questions of whether it is ever realistic or prudent to strive for users to rate a particular service very high, when the cost of achieving such a score may not ultimately deliver the requisite level of business benefit." (Peppard, 2003, p473)

The target levels of performance outlined in the SLOs are unrealistic as are the goals of the customer satisfaction surveys as they do not take into account that there are "likely to be diminishing returns beyond a certain level of investment where the cost of providing the service exceeds the benefits that can be expected (i.e. the overall value)" (Peppard, 2003, p473).

Table 18 shows target service levels measured in terms of downtime days; that is, the number of days in which a service will be unavailable. Clearly, it is unreasonable to have the same target service level for all services. Also, there is a conflict between target service levels and customer support response times.

Table 18 uses the service priority definitions in conjunction with the associated response times to calculate the number of yearly incidents permitted while still meeting targets. The table shows that the service level agreements are not reasonable.

Table 18 Service Availability in Days

Service	Downtime Target[1] (%)	Downtime Target[1] (days/year)	Resolution Target[1]	Yearly Incidents Allowed
ANX/ENX Connectivity	1.0%	4D	1D	4
ERP	1.0%	4D	1D	4
E-mail - External	1.0%	4D	1D	4
E-mail - Internal	1.0%	4D	1D	4
Enterprise Service Desk	1.0%	4D	1D	4
File Sharing	1.0%	4D	1D	4
Financial Reporting	1.0%	4D	4D	1
Data Backup and Restore	1.0%	4D	1D	4
Internet Access	1.0%	4D	1D	4
Intranet	1.0%	4D	1D	4
Local Area Network	1.0%	4D	1D	4
PDM	1.0%	4D	1D	4
Print Services	1.0%	4D	4D	1
Remote Access	1.0%	4D	4D	1
Security Management	1.0%	4D	1D	4
Telecommunications	1.0%	4D	1D	4
Video Conferencing	1.0%	4D	4D	1
Virus Protection	1.0%	4D	1D	4
Wide Area Network	1.0%	4D	1D	4
Workgroup Applications	1.0%	4D	4D	1

* Percentage of uptime assuming 365 day year
[1] During Local Business Hours

Source: Author (from data in the ABC IT Service Catalogue)

The SLO for Workgroup Applications is clearly too high. The IT Function sets a target of four down days per year for Workgroup Applications. However, the corresponding resolution target is also 4 days. This allows for only one Workgroup Application-related incident per year. By the same token, the same target service levels allow four days of downtime per year for the Enterprise Service Desk. This target service level is obviously unacceptably low, for an organization the size of ABC.

The IT Department needs to look at each service individually and determine an appropriate Service Level Objective. Having the same target service levels across the board is not prudent management of the customer support function. Creating Service Level Agreements for each service, with specific IT Customers or departments, will assist the IT Function to develop optimum SLOs and properly manage IT Customers' expectations.

Daily Operations

Daily Operations is another category of activity that consumes much of the IT Department's time and resources. Daily Operations consist of backup, data transfer, daily maintenance, basic system updates (patches), and other support and preventative measures that are performed on a regular basis. These activities absorb more time and resources than would otherwise be necessary in an environment where standardization was prevalent.

Many business applications (ERP and other information systems) within ABC are not fully integrated. Thus, IT personnel are forced to manually support the communication process between different systems. Support, in this regard, includes running custom-built data transfer applications and checking whether data has been properly disseminated into information systems.

Without standardization, system-wide updates cannot be carried out across the whole enterprise at one time. Special configurations must be considered for specific systems and computers. As such, these types of tasks cannot be batch-processed and require the on-site resources of IT personnel. With standardization, a single person could roll out a system-wide patch, for example, across the entire organization.

Currently, 20% of IT staff's time is attributed to Daily Operations, a significant allocation of resources considering the low strategic importance of the activity. Standardization would obviously alleviate some of this resource consumption; however, organizational processes still need to change to significantly lower the allocation of resources to this activity.

Upgrade and Replacement

Hardware and software upgrades are not commonplace within ABC. Nevertheless, when this activity is performed, it is usually planned well in advance and thus, occurs during off-peak periods. Presently, very few IT resources are allocated to this task of relatively low strategic importance.

New Technology Opportunities

ABC IT does not allocate time or resources towards the investigation of new technology opportunities, despite its high level of strategic value. The lack of attention to new technology projects is concerning as, although ABC does not "choose to make IT a strategic asset" (Ross, 1996, p37), there are still likely to be "situations in which competitors develop IT applications that become competitive necessities" (Ross, 1996, p37). Hence, the IT Function should remain abreast of new technologies and investigate opportunities for the addition of new technologies to existing service offerings.

New Solutions

ABC IT is currently in the process of migrating to a company-wide SAP platform. SAP will be rolled out in stages over the next five years. The undertaking of such a large project will put a lot of strain on the IT Function. As a group, the IT Function does not have significant experience in implementing large projects like SAP.

In recent years, the IT Department has rolled out only one large project, the ABC company-wide intranet. This project is nearing completion but is 250% over-budget. The SAP implementation gives ABC IT the opportunity to improve upon its record for enterprise-wide projects. Building skills in implementing new solutions is critical for the IT Function. To be successful the department will need to discover the causes of the current project failure and repair them before moving forward.

Proactive Resolution

The existing IT Department works, primarily, in a reactive capacity. For the most part, this approach is due to the financial constraints imposed on the IT Function. The focus on support is a key contributor to the reactive mind-set of the IT Function. Not a

significant amount of time is allocated to investigating solutions or problems before they become issues. For IT personnel, this is a major consideration and often results in the provision of the "quickest fix", not necessarily the best solution. For example, in 2001, ABC acquired businesses with existing ERP systems. The ABC IT Function was, therefore, faced with a situation that required the integration of three separate ERP platforms. A decision was made to facilitate the communication between these systems through band-aid solutions. In the end, this quick fix did not solve the problem. Ultimately, a more comprehensive and extensive solution was needed and so ABC decided to implement one integrated SAP platform across the global operation. This new system is documented in the ABC IT Solutions Roadmap. To avoid other such situations, ABC IT needs to proactively work on investigating opportunities before resolutions are actually required.

The majority of ABC IT's focus is on customer support. While customer support is obviously an important consideration for ABC IT, it provides minimal returns for the IT organization. It is imperative that ABC IT moves away from a customer support focus and toward providing services that bring greater value to the ABC organization.

The next section explores the Service Customer Matrix (SCM). SCMs provide a starting point for building relationships with the users of IT services. The SCM helps in understanding internal customers so that IT can provide services that will offer better value to these customers.

Table 19 Service Customer Matrix

	Customers by Location and Department																							
	Winnipeg						Paris						Miami						Dallas					
IT Services	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C	H	F	P	S	O	C
ANX/ENX connectivity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Asset purchase, inventory, and disposal	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Business applications support	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	
Design and implement IT based business	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•			•	
E-mail – external	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
E-mail – internal	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Enterprise Service Desk	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ERP		•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•		•		•	•	
File sharing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Financial reporting	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Hardware repair	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Information backup and restore	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Installations, moves, adds and changes	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Internet access	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Intranet	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Local area network	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
PDM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Print services	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Procurement	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Project resource management			•	•	•																			
Remote access	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Security management	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Software support (Desktop)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Telecommunications	•	•	•	•	•	•																		
Video conferencing		•	•	•	•	•		•	•	•	•	•		•	•	•	•	•						
Virus protection	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Wide area network (Inter-networking)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Workgroup applications		•	•	•	•														•	•		•	•	

H Human Resources
F Finance/IT
P Product Development
S Sales & Marketing
O Operations
C Corporate Dev

Source: Author

Service Customer Matrix

As with the Product Customer Matrices, an analysis of the relationship between customers and the IT services aids in determining the value of these services to IT Customers. The Service Customer Matrix is seen in Table 19.

The services described in the SCM are used by most geographic locations within the ABC organization. In some cases, services are consumed at only certain ABC office locations. For example, only IT Customers located in Winnipeg use the telecommunications service. As with product customer matrices, the worth of SCMs is found in using SCMs as a starting point for determining the value of these services to IT Customers. The matrix shows specific users of each service. This knowledge can help the IT Function in creating dialogues with specific customers to determine the value derived from the use of these services.

Product analysis has shown that the IT Function needs to build linkages with the IT Customer to gain an understanding of the value derived through the use of IT products. This is also true for the service component of the IT offering. Moreover, ABC IT needs to look at maintaining more realistic target service levels and focus on areas other than customer support.

4.2 Personnel Analysis

Recently, the IT Department underwent a series of layoffs. IT personnel that remain with the IT Function are considered as the top of the class. The combined skill-set of IT personnel within ABC IT is quite extensive. Unfortunately, changing demands on the IT Function have made it evident that there are deficiencies in the current pool of skills. The next section lists and compares the current skills against those that the Director of Information Technology feels are required to adequately and competently provide service to IT Customers. ABC IT's human assets are more than just the pool of skills. Human Assets have an intangible aspect called the Spirit of IT. The Spirit of IT will also be discussed in the following section. The organization of IT personnel, however, is analyzed in the section on Organizational Structure.

4.2.1 Skills

Table 20 depicts IT personnel skills by ABC office location. The table lists all the skills the IT team collectively possesses. The skills listed are ranked as weak, adequate and advanced depending on current competency. The skills are depicted by '-', '0', and '+', respectively. Cells in Table 20 that are left blank indicate that the respective skills will no longer be required at some point in the near future. Table 20 also provides an assessment of these skills based on current competencies and future needs.

Although the breadth of skills within the IT Function is extensive, skills are still not sufficient to drive the future direction of the IT Function. Some skills, such as Fourthshift and J.D. Edwards, will become obsolete when the full roll out of SAP takes place over the next five years (IT Solutions Roadmap, ABC Inc). Moreover, the IT Team currently lacks the business and project management skills necessary to investigate new opportunities and successfully introduce new solutions.

Table 20 IT Skills

	Winnipeg		Paris		Miami	
Skill	**Have**	**Need**	**Have**	**Need**	**Have**	**Need**
Network Security	+	+	0	0	0	0
LAN/WAN Administration	+	+	0	0	0	0
Server Hardware	+	+	0	0	0	0
Desktop and Other Peripheral Hardware	+	+	0	0	0	0
Telecommunications	+	+	0	0	0	0
Windows Operating Systems	+	+	0	0	0	0
UNIX/Linux Administrators	-	+	-	-	-	-
Site Infrastructure	+	+	0	0	0	0
Operations Management	-	+	-	0	-	0
Fourth Shift	+					
J.D. Edwards					+	
SAP	-	+	0	-		-
Desktop Applications	+	+	0	0	0	0
Email	+	+	0	0	0	0
Business Solutions Applications	+	+	0	0	0	0
Knowledge Management	0	+	0	0	0	0
Workgroup Applications	0	0	0	0	0	0
Database Administration	0	+	0	0	0	0
Project Implementation	-	+				
Business Case Preparation	-	+				
New Opportunity Investigation	-	+				

Source: Author

ABC IT consists of knowledgeable personnel who possess many skills. Many IT staff members are specialists in particular areas of technology. In many cases, only one member of IT may have the knowledge required to perform a task or activity. Individually, each member of the IT Function possesses a great depth of knowledge, rather than a breadth. The problem, however, is that when a particular person is away or chooses to leave the company, a void is created. It is difficult to fill the gap of knowledge and expertise that is left by the departing individual. Another consideration is the fact that an individual may be the only one in the entire organization who has knowledge about a specific technology. According to Porter (1980), having so much

power in the hands of a supplier, in this case, an IT specialist, places the IT Function at a bargaining disadvantage. These factors make the policy of specialization within the IT Function a high risk for the company. To diversify this risk, more than one employee must be able to fix, maintain and support any one technology.

4.2.2 The Spirit of IT

The IT Team at ABC appears to work well together but lacks a shared vision. The lack of clear understanding of the role of IT within ABC is a concern among members of the IT Function. Additionally, many IT staff members feel that their ability to contribute to the IT organization is under-utilized.

The mission and vision statements and guiding principles that direct the current IT organization are obsolete. These statements of IT strategy were developed prior to business acquisitions of 2001 and before many of the existing IT personnel joined the ABC organization. This lack of cohesive direction and unity results in many members of the team being uncertain about the future of the IT organization and their respective contributions to ABC's success.

As part of this strategic analysis, a workshop was conducted to assist the IT Department in creating a shared mission and vision. The workshop proved very useful to the IT Department, as a whole. However, many of the members of the IT Department still feel they could do more to add value to the organization. Running the IT Department with the mind-set of a support organization, rather than a strategic business unit, contributes to the lack of a clear business vision.

4.3 Organizational Structure Analysis

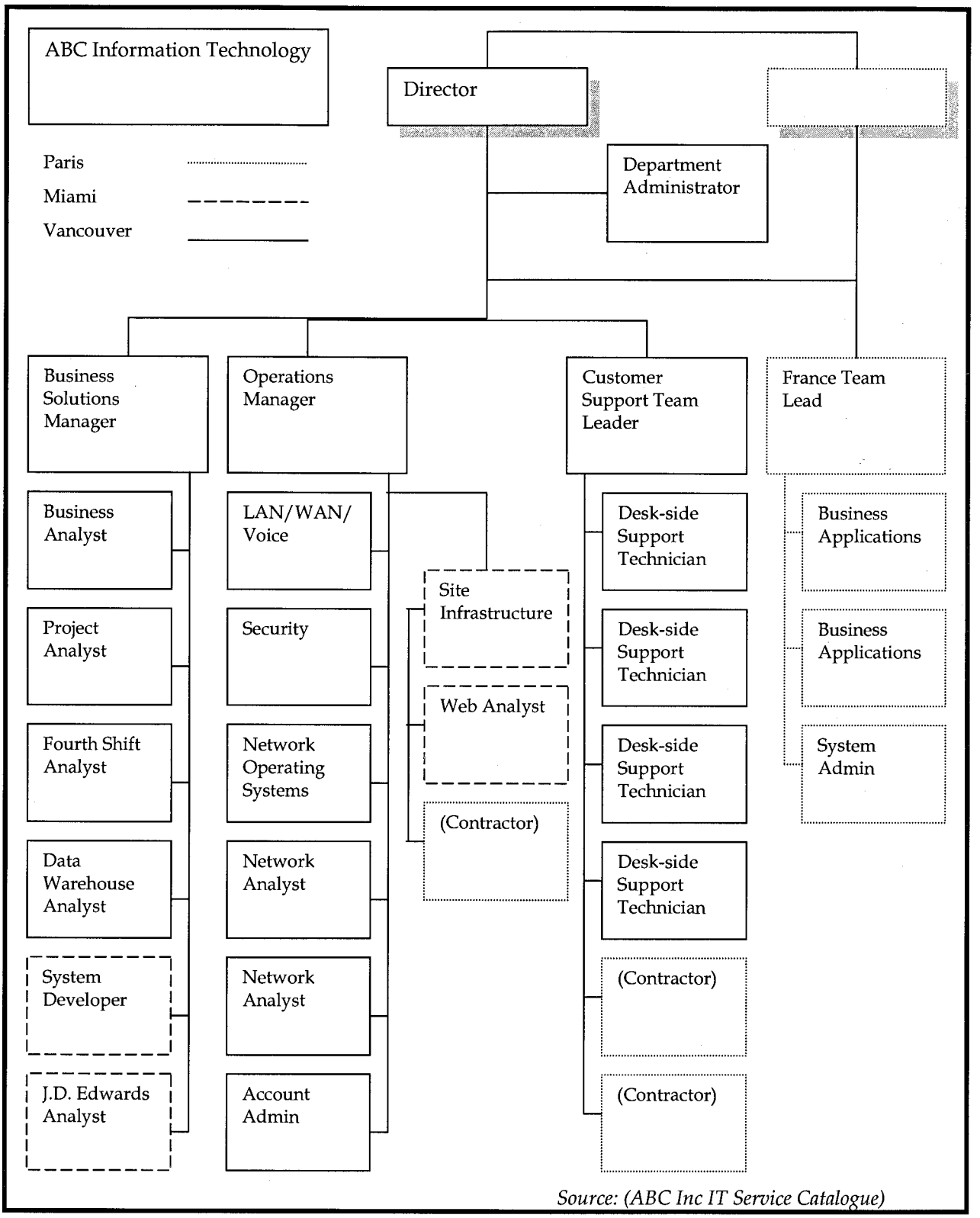
An organizational analysis will show the deficiencies in the existing organizational structure of ABC IT. The IT Department's current layout has endured the numerous changes that the ABC organization has undergone over the past few years. However, the structure has not evolved to the degree necessitated by the changes in IT's environment. As such, the current structure does not serve the present needs of ABC IT. This section describes the current structure and the historical reasons for the existing organizational

layout. It explores the reasons why this structure is no longer suitable. This explanation delves into why the structure adversely affects the IT organization's core competencies and creates a lack of harmony.

4.3.1 Current Organizational Structure

Figure 3 shows the current organizational structure of the IT Department. For legal purposes, the IT division located in France symbolically reports to a figurehead in France. In reality, the Paris IT division reports to the Director of Information Technology in Winnipeg, MB. This is consistent with the rest of the IT organization. The IT Department is primarily split along the three lines of business mentioned in earlier sections: Business Solutions, Operations and Customer Support. For the most part, all IT personnel report through these functional lines. The majority of IT personnel are located in the Canadian head office. Miami and Paris are smaller sites in relation to Winnipeg, while Dallas has no on-site IT staff. Many of the IT personnel in these offices were inherited through the acquisitions of businesses.

Figure 3 IT Organizational Structure



Source: (ABC Inc IT Service Catalogue)

To understand the current demands on the IT Department it is important to note the number of internal customers the IT Department supports at each location. Furthermore, to meet the needs of the site-specific customers of IT, it is valuable to note the number of on-site IT personnel at each location. This logic assists us in showing that each of the remote locations only requires minimal physical support on the part of the IT Function. Table 21 will prove useful in the recommendation of a new organizational structure for the IT Function within ABC. The figures are reasonable estimates as exact data was unavailable.

Table 21 IT Support Numbers by Location

	Dallas	Miami	Paris	Winnipeg
Total ABC Staff	60	120	250	750
IT Staff per site	0	4	6	19
IT Staff in Support Role	0	3	4	13

Source: Author

Each member of the business unit is a specialist for a certain aspect of the unit's technology area. In many cases there is only one individual who holds this knowledge. This implies that when these individuals are not available, their respective tasks are either put on hold or, when possible, are assumed by other members of the IT Department. Further downsides of this situation were explored in the Personnel Analysis.

Each member of the team plays a customer support role in their respective area of expertise. In addition to support duties, each member must perform maintenance and other daily operational duties, and investigate new opportunities and solutions. Often, there is not much time to complete the latter two tasks as time is compromised by the overwhelming needs of customer support.

The fact that ABC is now a global operation offers constraints in the manner in which the IT organization operates. Firstly, there is a language issue. Although many IT Customers in France are well versed in English, the majority of IT Customers in this area need support in German. Secondly, the organization operates over multiple time zones.

The time difference across the different geographic office locations requires that a support centre operate nearly 24 hours a day to ensue that all ABC sites are supported. This is why outsourcing the Enterprise Service Desk makes sense for immediate support issues.

An analysis of the organizational structure reveals that the structure is a divisional form. Nohria describes a divisional structure as a structure that groups diverse functions into divisions (Nohria, 1995, p. 5). In the case of ABC IT, this means that a given division is based on a technology and all IT Functions (projects, customer support and operations) related to this technology occur within this given division. The problem here is that these functions often require technologies that span across multiple divisions. For example, projects often require the involvement of business solution and operation's infrastructure specialists. The current organizational structure does not recognize this aspect of the ABC IT Function.

Nohria suggests that when investigating organizational structure, the informal structure of the organization should also be considered. The "informal relationships are often as important as the formal ones in terms of how information flows and how things get done in the organization."(Nohria, 1995, p. 6) The informal structure of ABC IT is one of cooperation of members from different divisions to perform a certain task.

It is clear that the current structure needs to change. The informal structure of the IT Function and the existing demands on IT personnel are not supported by the current organizational structure.

4.3.2 Lack of Harmony between Organizational Structure and Function

There seems to be a general level of respect among members of the IT Department. Weekly management meeting, conducted through conference calls, ensure that there is a medium for communication with IT personnel in the US and France. Nevertheless, there are some issues that create a lack of harmony within the IT Function. The main issue is that the existing organizational structure is still in its legacy form. The structure has not transitioned to one that suits the structure warranted by the changes that IT has experienced in conducting its business. (Mintzberg, 1990, p5)

The current structure, as outlined previously, does not match the demands of the organization. The IT organization is divided along technology lines. According to Mintzberg, the critical factors of the organizational structure are not met. These critical factors are consistency, coherence and fit (Mintzberg, 1990, p14). Consistency, coherence and fit speak to the harmony that the structure achieves with the requirements of the organization. That is, does the current organizational structure help or hinder ABC IT? For ABC IT, the organizational structure is a hindrance.

The structure of the IT organization does not match the functions that the IT Department is required to perform. To clarify this point, it is important to review how the IT Function is divisionalized and recognize the duties performed under each division. Table 22 shows a breakdown of the three lines of business, Operations, Customer Support, and Business Solutions, and the specific duties that each division is expected to perform.

Table 22 Funtional Duties versus Division

Service	Details	Operations Function*	Customer Support Function*	Business Solutions Function*
New Purchases	Determine system to meet customer needs, screen unnecessary requests, purchase and install	5%	10%	0%
Customer Support	Incident resolution	15%	80%	45%
Daily operations	Maintenance, backup, data transfer	40%	0%	15%
Upgrade, Replacement	Software, hardware and security	10%	10%	5%
New Technology Opportunities	Investigate technologies to improve efficiencies and provide value	0%	0%	0%
New Solutions	Implement, test and go live with new technology solutions	10%	5%	20%
Proactive Resolutions	Investigate problems before they occur and resolve them	15%	0%	5%
Administration	Team meetings, etc	5%	5%	10%
*** Time Allocation** - Values are percentage of time estimates for each function within the IT Department. Data from records maintained by function management				

Source: Author

From Table 22, we see that each line of business is required to perform a number of different tasks. These duties require varying levels of expertise and attention. Tasks that require a breadth of knowledge but limited depth are: Basic Customer Support Requests, Change Requests and Routine Daily Operations. Many of these tasks have a hands-on component (installing hardware, etc).

The remaining tasks require more specialized skills and knowledge. Thus, both a depth and breadth of knowledge are necessary for each line of business. Consequently, this does not allow for "economies of scale in the use of internal resources" (Nohria, 1995, p7).

The need for some tasks to have specialized skills, while others do not, suggests that the divisions within the IT Department lack core competencies. The absence of core capabilities can be attributed to the fact that IT personnel are forced to blend customer support activities and operational tasks with more advanced tasks such as investigation associated with new projects or new opportunities. As such, ABC IT requires an organizational structure that allows for a focus on technological core competencies.

To solve these various issues, the structure of the IT organization needs to evolve. The new structure should allow for the sharing of highly technically skilled members who can perform various tasks and duties. To create core competencies, tasks of a similar nature should be grouped. The new structure should consist of divisions along duties (projects, operations, support), which have access to a team of highly skilled technologists. This highly skilled team can pool their depth of knowledge and assist the divisions. To achieve this end, each remote ABC office needs IT personnel that are focused on site-specific duties and daily support and operations tasks. At the same time, the head office needs IT personnel that investigate issues that effect the entire organization.

The current organizational structure of IT Function has worked in the past but it needs to change. The structure needs to reflect the current and future demands of the IT organization. It must allow for capitalization on economies of scale possible with a global organization of ABC's size.

4.4 Analysis of the Financial Constraints on the IT Function

The IT Department has been able to manage a continually declining budget. In prior years, the IT budget was not closely monitored and therefore, much inefficiency existed. Over the past two years, many of these inefficiencies have been uncovered and rectified. As this financial trend is expected to continue, radical changes will be necessary to meet future budgets.

The IT budget is derived each year based on a fixed value granted by the ABC Executive. Over the past two years, the amount granted by the Executive has decreased nearly 50%. The Director of Information Technology divides this budget amongst the

various lines of business within IT the department (Operations, Customer Support, and Business Solutions, as well as IT operating expenses). Each line of business is required to put forward projections of expenses for the upcoming year. If the total of these projections is less than the total budget allocated to IT, there is no issue. If, however, this is not the case, the specific budget needs to be validated. If compromises cannot be reached, the matter is brought to the ABC Executive and debated at this level.

The projections are predominantly determined based on status quo operating costs. To determine what financial requirements a project will have in the coming year, a general survey of requirements is made. This method has been successful in the past but still faces many shortcomings. Firstly, the IT budget is declining but the spending on capital support is scheduled to increase as the IT Function will soon be assuming infrastructure support costs of aging hardware. In another two years, with the pending hardware upgrades, there will be a large cash outlay as replacement costs for hardware become part of the IT budget. The second issue is that without a strong connection to the business side of ABC, it is impossible for IT to know if cost-saving measures are affecting the organization in a negative manner. Instead, if each functional business unit within ABC were responsible for defending its own IT budget, then the disconnect between business and IT could be alleviated. Obviously, there are some expenses, such as salaries, training and other basic operation costs that will remain the sole responsibility of the IT budget.

4.5 Analysis of the Management of ABC IT

The current management model, running IT as a support function, does not work. The management methods of ABC's IT Department are a reflection of their quick growth from a start-up, when access to market capital was abundant. Now, as ABC dictates financial cuts of 25-35% across the board and the organization remains spread geographically, a new management model is needed.

Traditionally IT has been run as a support function not as a business. IT Customers do not pay for their use of IT services. IT expenses are incorporated into the IT Department's continually decreasing budget. This method makes internal accounting

easy for the ABC organization, as opposed to a utility billing or charge back model. However, this is the only advantage. Neither the customer, nor the IT Department is able to clearly articulate the cost/value relationship of IT-related products and services. With the large decreases in the IT budget, this situation is problematic.

Additionally, the traditional method has rendered the IT Department unable to contribute to the ABC organization's strategic goals. Although the IT Function may not be the source of competitive advantage for ABC, it still remains critical in an organization where knowledge is a key asset. This is clearly the case for ABC, a research and development firm that is migrating into full-scale manufacturing.

The major issues with the way IT is managed are:

- Product selection is not constrained by rents.
- Focus is on being a support function rather than a business.
- The organizational environment has changed to meet ABC's needs but the IT Department remains operated in the tradition of a small organization.

Peppard suggests that to best manage an IT organization it must be managed as a portfolio of services. "[S]ervice management is a total organisational approach that makes utility of service, as perceived by the user, and the value of service to the organisation, as the number one driving force for the operations of the IS organisation"(Peppard, 2003, p473). Peppard breaks the IT services into four categories that are linked by infrastructure. These are: Strategic, High Potential, Key Operational and Support.

- **Strategic** - critical to future business success by providing competitive advantage. The assessment is based on business contribution.
- **High Potential** - may create opportunities but are as yet unproven.
- **Key Operational** - application services on which the organization depends.
- **Support** - improve business efficiency and management effectiveness but do not sustain the business.

As expressed in the analysis of IT services, the current focus for ABC is on Key Operational and Support, with little to no emphasis on High Potential or Strategic services. For ABC IT to contribute, in terms of both utility and value, it needs to make sure that process and focus include High Potential and Strategic services.

5 Alternative Strategies for ABC IT

The preceding analysis shows that the ABC IT Function is in need of radical changes. The problems that the IT Department faces are serious. To meet the corporate strategic goal of a 25-35% decrease in budget across the organization, IT must reduce expenses significantly. This reduction in expenses will happen by cutting costs within IT and the rest of the organization. To achieve this result, IT needs to build stronger ties with IT Customers so as to determine opportunities for change. Stronger links need to also be created with the ABC Executive so that IT can be more strategically aligned with the ABC business.

This section outlines the various alternatives available to ABC. Each alternative is defined. The section also expresses the criteria used to evaluate the above-mentioned alternatives. Finally, each alternative is assessed in terms of its relative strengths and weaknesses.

The recommendation that stems from these alternatives is based on evaluation criteria that seek to meet the following objectives:

- Reduce IT operating expenses.
- Reduce operating expenses throughout the rest of the ABC organization through technological solutions that provide efficiency gains.
- Provide strategic support to the organization, as a whole.
- Build links with IT Customers to align IT Customer incentives with those of the organization.

Change is definitely necessary for the IT department. The Executive has dictated a company-wide reduction in expenses of 25 -35%. IT is not excluded from this mandate. The IT budget will continue to decline and ABC IT needs to change to meet this

requirement. Not only must ABC IT decrease its expenses, so must the entire ABC organization, including all projects and departments. ABC IT can help the organization, in this regard. Due to its unique position within the organization, IT has the opportunity to discover technological solutions that can create efficiencies within other departments and projects; thereby reducing the department or project's costs. The IT Department must move to provide strategic support for ABC and build links with IT Customers. By providing the organization with the technology to support strategic goals, IT can aid ABC in achieving these goals. This can be further achieved if links are also created with the customers of IT; thereby strengthening the relationship with IT Customers and organizational strategy.

5.1 Definition of Alternative IT Strategies

This section outlines five alternatives for ABC IT in meeting the objectives described in the previous section. The next section provides an evaluation of each alternative's viability in achieving these goals.

5.1.1 Status Quo - Maintain the Current Course (Alternative 1)

Status quo or maintaining the current course is always an alternative. This alternative dictates that ABC IT continues to operate as a support service. Under this scenario, cost reductions would result from existing cost-cutting measures and efficiency gains from changes currently being implemented.

With this option, ABC would still experience cost savings within the IT Department. ABC IT has already initiated standardization of products and technology to reduce costs. With SAP, the company will achieve a degree of integration that will free up resources. Cost savings will materialize as economies of scale and scope are realized.

The Enterprise Service Desk would remain outsourced but all other activities would remain in-house. The outsourcing of the ESD enables a small department to provide immediate support for ABC's global operations. An outsourced ESD also allows ABC to benefit from the economies of scale that are available from a highly utilized customer support service desk.

Maintaining the status quo would mean that the IT Function continues to implement IT solutions demanded by the ABC Executive. IT would still not be a source of competitive advantage for the ABC organization. The current role of IT would remain unchanged. With the Business and IT Strategy Council in place, ABC IT would still develop connections with the ABC Executive, in an effort to tie IT with business strategy decisions.

5.1.2 Outsourcing IT (Alternatives 2 and 3)

An option for ABC is the outsourcing of IT. As a result, the decision to outsource IT provides the ABC organization with two alternatives: outsourcing part of the IT Function or outsourcing all of the IT Function. As mentioned earlier in the analysis, outsourcing IT entails the purchase of IT products and services, previously provided by the internal IT Department, from an outside vendor or supplier.

There are many factors that would drive ABC to outsource IT. Firstly, ABC's business strategy calls for the reduction of costs across the entire organization, including IT. The existing IT Function is void of sufficient economies of scale. Outsourcing the IT Function to a third-part supplier should help the ABC organization to reduce costs. Outsourcing suppliers derive economies of scale through centralized data centres, preferential contracts with suppliers, and large pools of technical expertise. (Pearson and Saunders, 2004, p.198). To date, however, ABC IT has not been able to find outsourcing vendors that have been able to provide IT services at a lower cost than those provided by the existing IT Function.

Secondly, ABC has decided to shift its existing technology systems into one integrated SAP platform. The current IT Department lacks the skills and knowledge to successfully implement the SAP solution. Outsourcing suppliers provide a larger pool of talent and a broader knowledge base of advancing technologies. As such, outsourcing IT helps ABC transition to a new technology.

Thirdly, research and technology development is ABC's core competency. Furthermore, the company strives to better its capabilities in the areas of manufacturing, service and sales and marketing. IT is not a core capability for ABC. By outsourcing the IT Function,

ABC management "can focus less attention on [IT] and more on information itself" (Pearson and Saunders, 2004, p.199). In this manner, IT personnel still manage the relationships with outsourcing suppliers and are ultimately responsible for IT services. However, IT managers are free to devote their energies to areas that concentrate on the entire organization's core competencies.

Fourthly, the current IT organization faces training issues relating to the maintenance of the skill-level of IT personnel. Outsourcing suppliers specialize in IT services. Accordingly, it is the responsibility of outsourcing vendors to find, train, and retain highly marketable talent. Outsourcing IT helps ABC avoid the nuisance associated with hiring and retaining skilled personnel as well as the costly investment in training IT personnel to keep abreast of marketplace technologies.

Next, the current IT Function lacks the capacity on demand that may be necessary during peak periods. The greater resources of an outsourcing vendor can allocate the potentially necessary mainframe capacity that the existing IT Function does not have the resources to provide.

Finally, the current IT Function has had trouble consolidating the various data centres that existed in the companies that ABC recently acquired. An outsourcing supplier could assist in this regard. Additionally, outsourcing offers an infusion of cash as ABC sells its existing hardware and equipment to an outsourcing vendor.

Table 23 summarizes the above-mentioned drivers for ABC to outsource the IT Function.

Table 23 Drivers for Outsourcing the IT Function

Drivers
Offers costs savings
Eases transition to new technologies
Offers better strategic focus
Provides better management of IT personnel
Handles peak periods
Consolidates data centres
Injects cash

Source: (Pearlson and Saunders, 2004, p. 200)

"The decision to outsource is driven by business considerations that depend upon the scale, skills, and strategy of the [ABC] enterprise" (Ballaguer, 2003, p. 347). Once ABC decides to outsource, it must also address what needs to be outsourced. That is, the ABC organization must decide whether to pursue outsourcing fully or selectively.

Alternative 2 - Full Outsourcing

Full outsourcing of IT implies that ABC outsources the entire IT Function from desktop services to software development. It makes sense to the ABC Executive to outsource all IT services, as the company does not view IT as a strategic advantage that needs to be cultivated internally. Full outsourcing provides ABC with the following advantages (Pearlson and Saunders, 2004, p. 202):

1. Frees resources that may be employed in areas of competitive strength.
2. Reduces overall cost per transaction due to economies of scale.
3. Allow managers to focus attention on other business issues.

Alternative 3 - Selective Outsourcing

With selective outsourcing, ABC chooses which IT products and services to outsource to an outside supplier and which ones to retain in-house. Selective outsourcing allows ABC to take the "best of breed" approach by choosing outsourcing suppliers based on expertise in specific technology areas. One major areas of expertise is technology

infrastructure outsourcing. Technology infrastructure outsourcing is an area of selective outsourcing that provides ABC with benefits not realized with the existing IT Function.

Technology Infrastructure Outsourcing helps ABC focus on core business strategies while the outsourcing supplier concentrates on the technology. For ABC, a technology infrastructure outsourcing arrangement could involve the following (Balaguer, 2003, p. 347):

- Outsourcing the operation of data servers, network devices, and hardware;
- Outsourcing the management of internal infrastructure including networks, office equipment (LAN, desktop), and telecommunications; and
- Outsourcing the responsibility for security and disaster recovery for all computing and network functions.

In summary, ABC can use the alternative of outsourcing all or part of the IT Function to make an impact on the company's bottom line and focus on organizational business objectives. Full or selective outsourcing provides ABC with varying degrees of lower costs, access to competitive skills, and increased ability to respond to changing business needs. Outsourcing IT assists ABC in achieving the following (Balaguer, 2003, pp. 351-354). :

- Achieving economies of scale;
- Support in the form of skills and expertise;
- Strategic focus; and
- Speed to react to changes in the competitive landscape.

ABC should consider outsourcing the entire IT Function or its technology infrastructure. Outsourcing is a viable alternative as long as ABC finds an outsourcing supplier that can do any of the above better than is done by the current IT organization.

5.1.3 Run IT as a Business and Bill IT Customers (Alternative 4)

The analysis suggests that the IT Function migrate from a support operation to an internal business within ABC. The dynamics of this alternative require that ABC IT be

managed as a portfolio of services. Furthermore, this option calls for IT to be run as a service operation that sells its portfolio of products and services to IT Customers.

Running IT as a business relieves internal market failures and creates value by building a cost-based relationship with IT Customers. To achieve this end, IT must determine the cost of each product and service and move to a funding method whereby the IT Function bills IT Customers for the use of IT products and services. If the cost of a particular IT product or service is deemed higher than the associated benefits, IT Customers will not demand the particular product or service. The market for given products or services will essentially determine which products or services that ABC IT decides to supply.

Strategy is another factor in running IT as a business. Business competencies will need to be developed to effectively run IT as a business operation. The IT Function will be able to "prioritize IT investments based upon a hierarchy of business needs and values" (Kesner, 2002, p. 16). By adding a strategic element to the management of the IT assets, the IT Department can work to provide services and products, which meet the strategic need of the organization. The IT Function's goal would then be to provide cost savings and efficiencies not just within IT but also throughout the organization.

This alternative requires that costs of IT products and services be charged to projects or departments that consume these products and services. This model will change the budget structure for the ABC organization. In this option, no longer will all IT expenses fall under one budget. Instead, IT budgets will be integrated within projects and departments. The ABC Accounting Department will be instrumental in facilitating this new utility-billing model. Further changes will also be necessary to drive the IT organization from a support role to a business focus. Changes in organizational structure and human resources will be required for ABC IT to offer support and other value-added services.

5.1.4 Run IT as a Business and Bill the ABC Executive (Alternative 5)

This alternative is similar to the previous option. The main difference, however, is that IT tracks expenses on a project/department basis and conveys this information to the

ABC Executive, instead of the specific IT Customers. ABC management then decides whether the specific expense is justified. Thus, under this alternative, IT costs are charged to ABC management.

Shifting costs from specific IT Customers to the ABC Executive works to strengthen the value and visibility of IT within ABC. This method arms company management with the information necessary to make decisions on whether to continue or terminate projects. Additionally, this alternative will not require significant changes to internal ABC processes, such as accounting.

Under this option, IT Customers are not billed directly for IT-related costs or expenses. Budgeting would not change and there would be no impact to accounting.

5.2 Criteria for Evaluating Alternative IT Strategies

Table 24 provides a means to evaluate the alternatives described in the previous section. All five alternatives were evaluated and scored based on the ability of each alternative to meet the objectives outlined in the introduction to Section 5. Each objective was scored from 1 to 5, with 5 being the best score. These objectives were not individually weighted as each goal is considered to be equally important to the success of the ABC IT Function.

Table 24 Alternatives Evaluation

Alternative	Reduces Costs of IT Department	Reduces Costs of other ABC Departments	Aligns IT Function with ABC Strategy	Builds links with the customer	Total
1.Full Outsourcing	4	5	1	1	11
2.Selective Outsourcing	3	3	1	1	8
3.Status Quo	1	1	3	2	7
4.Bill the Customer	5	5	3	5	18
5.Bill the Executive	5	5	5	5	20

Source: Author

5.3 Evaluation of Alternative IT Strategies

Table 24 provides a score for each alternative based on the alternatives ability to meet a specific objective. This section describes the reasoning behind the scores attained in Table 24. A recommendation will follow in the next section.

5.3.1 *Status Quo - Maintain the Current Course*

This analysis demands that the IT Function needs a significant change. As such, maintaining the current course is not a reasonable option. Maintaining the status quo will lead to cost savings for the IT Function, as certain cost-saving measures have been put in place. However, this alternative does not offer savings to the other organizational departments, an opportunity that the ABC organization cannot afford to miss. Further, continuing to run IT as a support function reduces IT's ability to provide strategic value. Current literature on the importance of IT to business strategy points towards the need to strategically align IT with organizational business objectives, even though IT may not provide direct competitive advantages. Relationships with IT Customers are already less than optimal and maintaining the current course will not likely change this scenario.

5.3.2 *Full Outsourcing*

The full outsourcing of IT offers ABC and the IT organization two attractive features. Firstly, outsourcing the entire IT Function reduces operating expenses throughout the rest of the ABC organization through technological solutions that provide efficiency gains. Secondly, full outsourcing affords the opportunity to significantly achieve cost savings.

However, outsourcing the entire IT Function is not really a practical alternative for the ABC organization. To begin with, outsourcing the entire IT Function does not build stronger ties with IT Customers. Additionally, the full outsourcing of ABC IT works against the idea of business and IT strategy alignment. As mentioned earlier in the analysis, IT is not a core competency within ABC and, as such, the IT Function could be considered for outsourcing. However, "some non-core activities may have to be retained in-house if they are part of a defensive posture to protect competitive advantage (Quinn,

1992). In this regard, ABC compromises business and IT alignment by outsourcing the entire IT Function and relinquishing a certain degree of control over privacy and security.

Outsourcing the whole IT Function does not align the incentives of IT Customers with those of the ABC organization. Full outsourcing challenges the proper alignment of business and IT Strategy. Thus, full outsourcing is not a practical alternative for ABC and the IT organization.

5.3.3 *Selective Outsourcing*

Selectively outsourcing the technology infrastructure capabilities of the IT Function is also not a sensible option for ABC and ABC IT. For the same reason stated above, outsourcing part of the IT compromises ABC's defensive posture as it relates to the protection of ABC's intellectual property. Therefore, selective outsourcing also challenges business and IT strategy alignment. This alternative also prohibits IT from building relationships with IT Customers. Moreover, selective outsourcing impacts the costs savings, for the IT Function and the rest of the organization, to an even lesser degree than full outsourcing. For these reasons, outsourcing technology infrastructure is also not a reasonable option for ABC.

5.3.4 *Run IT as a Business and Bill IT Customers*

This alternative is a very practical option for ABC and the IT Function. This option provides IT with a path to move from a support role to a business focus. Billing IT Customers for IT-related costs allows for customer-supplier interaction, an element that is currently missing from the ABC IT Function.

Running IT as a business operation and billing IT Customers for services would make the IT Function more visible across the ABC enterprise. Dialog would be created between IT and IT Customers throughout the company, as IT Customers are made more aware of IT-related costs. The links to the customers that are created through this dialog would result in a reduction of IT expenses as more aware IT Customers become cost-conscious. Communication with IT Customers affords ABC IT with an opportunity to

learn about its customer's needs. This, in turn, will create opportunities for efficiency improvements that will result in cost savings throughout the organization.

As mentioned, this alternative also provides the IT Function with a business focus. A business focused IT Department would lead to a more strategically aligned IT Function. By communicating with IT Customers on a business level, the IT Function moves from a purely support capacity to one that strategically contributes through its customers.

Although this alternative provides the radical change that the organization needs, billing IT Customers would also have a significant impact on the internal processes of IT Customers. This may place IT in a negative light in the eyes of its customers. At this time, it is felt that IT does not have the ability to dictate organizational-wide process changes.

This alternative provides a means to develop a business focus through relationship building with IT Customers. However, the IT Function could provide more strategic value if the relationship building was with ABC management. As such, this alternative lacks the avenue to assist the IT Function in developing strategic ties with the ABC Executive.

5.3.5 Run IT as a Business and Bill the ABC Executive

Running IT as a business and billing the ABC Executive is the most practical alternative for ABC IT. The advantage of this option is its ability to reduce operating costs for IT and the rest of the organization through a dialog between suppliers and customers of IT. Furthermore, billing the ABC Executive creates a connection between IT and the company management and, in turn, provides IT with an avenue to develop a strategic relationship with the business of ABC.

By tracking the cost of IT by customer, the IT Department can develop a picture of who actually uses specific IT products and services. It also gives information on the allocation of IT costs by project and department. This information can be used to create a dialog with IT Customers about the costs of IT to the organization. Furthermore, this

information can then be conveyed to the ABC Executive to facilitate strategic decisions about projects within the firm.

By conveying the IT costs to the Executive, the IT Department increases its visibility within the organization and its ability to contribute strategically to the company's business goals. A consistent dialog with the Executive will align the IT Function further with the ABC organization, as a whole. Additionally, individual customer dialog will increase IT's ability to determine cost savings at the customer level.

This solution is a radical change for ABC IT. The IT Department must change its structure, resources and management to move from a support focus to a business one. The department will require an infusion of business knowledge and process changes to run IT as a business operation. Although this change will be radical for the IT Function, the impact is less for the rest of the organization. By tracking IT costs within the IT Function, the need to invoke process changes that involve the rest of the organization, such as Accounting, is removed. Thus, running IT as a business and billing the ABC Executive is differentiated from the previous alternative, making Alternative 5 the most viable option for ABC IT.

6 Recommended Environment for ABC IT

IT is evident from the previous section that the best alternative for ABC IT is to run the department as a business and bill the Executive. The following section provides further details as to why this alternative is selected. The section also briefly describes the details of the recommended IT environment.

6.1 Run IT as a Business and Bill the ABC Executive

Running IT as a business is the ideal alternative. This alternative not only meets the stated objectives but also addresses all the issues explored in this analysis. As mentioned previously, running IT as a business would solve many of the problems facing ABC at this time. The IT firm would be able to: provide services with real business value; achieve economies of scale; and provide value added services.

To achieve this, however, ABC IT will require major changes. The end result will be an IT Department that has reduced, not only IT costs, but provided services that result in greater efficiencies and cost savings throughout the organization. In this regard, the following fundamental changes to the IT Function are necessary:

- Shifting from a support mentality to a business focus.
- Determining the value of products and services offered by IT.
- Building a stronger relationship with the ABC Executive.

To successfully run IT as a business, the IT Function needs to migrate away from its traditional role as a reactive support function. The IT Function must operate in a more proactive capacity in which IT provides business value to the whole ABC enterprise. To change focus, the ABC IT will need to communicate this intention as well as reorganize to meet this end.

To provide better-valued services within ABC, the IT Function needs to do the concentrate in two areas. Firstly, IT needs to gain an appreciation of the relationship between IT products and services and the users of these products and services, IT Customers. The IT Function should begin by measuring the costs of providing IT products and services to IT Customers. Secondly, IT costs should be tracked on a project and user basis. This information should then be communicated with customers of IT to initiate an appreciation of the value of IT to the ABC organization. In this setting, IT Customers would be more aware of the impact of their IT-related decisions.

The detailed cost breakdown should then be communicated to the ABC Executive so that company management understands the value of IT products and services. This arrangement also allows for closer communication between business and IT. Through this understanding, a foundation is set for a closer business and IT strategy. ABC management will have the ultimate decision on which IT products and services to continue to provide and which projects are strategically important.

To facilitate this type of environment, additional changes are required within the ABC enterprise. These changes are detailed in the following section.

6.2 Recommendation Details for the Proposed IT Environment

This section describes further changes that are required to meet the recommendation of the previous section. This section will detail these changes with respect to four key areas:

- Product
- Human Resources
- Organizational Structure
- Management

These four key areas are, by no means, an exhaustive list. However, this section seeks to provide some additional details that should be considered when implementing the solution recommended in the previous section.

6.2.1 *Product Changes*

The current scope of product offerings needs to be standardized. This process has already begun. Furthermore, the choice of product and service offerings needs to be limited by the value provided to the organization. IT and IT Customers, jointly, should determine this value.

By creating a comprehensive list of the total costs associated with each product and service, the IT Department can determine the true value of its product and service offering. If this value does not exceed the cost, then the particular product or service should no longer be offered. This concept will take time to materialize but should prove the most direct way to reduce IT Department costs.

The IT Department can also work with IT Customers and the ABC Executive to determine what products and services to offer. This allows the IT Function to contribute strategically by providing products and services that help to further organizational strategic goals. For example, as ABC moves towards a manufacturing and sales business focus, the IT Department could research opportunities for a customer relationship management product that will assist the company in building stronger customer relationships and improve customer satisfaction. Also, by working directly with the IT Customers, IT can determine product improvements that will help improve current business processes. These new solutions and opportunities will provide value to the organization through cost-reduction and efficiency gains.

Product changes and enhancements are critical. The product offering needs to be streamlined through product standardization. This will assist in reducing support resource requirements. The product offering needs to only provide products with a higher value than cost. Finally, IT needs to work with IT Customer and ABC management to provide products that reduce costs and improve efficiencies throughout the organization.

6.2.2 *Human Resource Changes*

Skills and human resources changes will also be necessary to change ABC IT to a business focus. This section will briefly discuss the skills and human resource component. This will be more fully explored, however, in a subsequent section on organizational change.

The IT organization will need to reduce the amount of time that is spent on customer support activities. The major gaps in skills discovered through this analysis are in UNIX, business understanding, and operational management. To improve the ability to provide both business and technological solutions, ABC IT needs to improve on these areas.

The key skill requirements of a recommended IT organization will be both business and technology focused. To be successful, the IT Department will need an ability to roll out projects on time and on budget. Additionally, IT will need to meet the needs of IT Customers. To do this, IT requires skills in the areas of project management, business strategy and quality assurance.

For ABC IT to run as a business operation, the collective skill-set of IT personnel needs to include business skills. As the focus moves away from a support role, the IT organization will need fewer personnel to provide customer support to the company. It is very likely that IT personnel head count would remain the same as resources can be shifted from support functions to ones with business focus.

6.2.3 *Organizational Structure Changes*

For ABC IT to achieve a radical change, major organizational structure changes are needed. A recommended IT organizational structure is shown in Figure 4. This structure will meet the needs of the IT Function. A detailed explanation of this organizational chart and relationships follows.

The new organizational structure consists of three divisions, similar to the current scenario. The difference, however, is that the proposed IT structure makes better use of IT resources. The three departments in the proposed organizational structure are: Daily

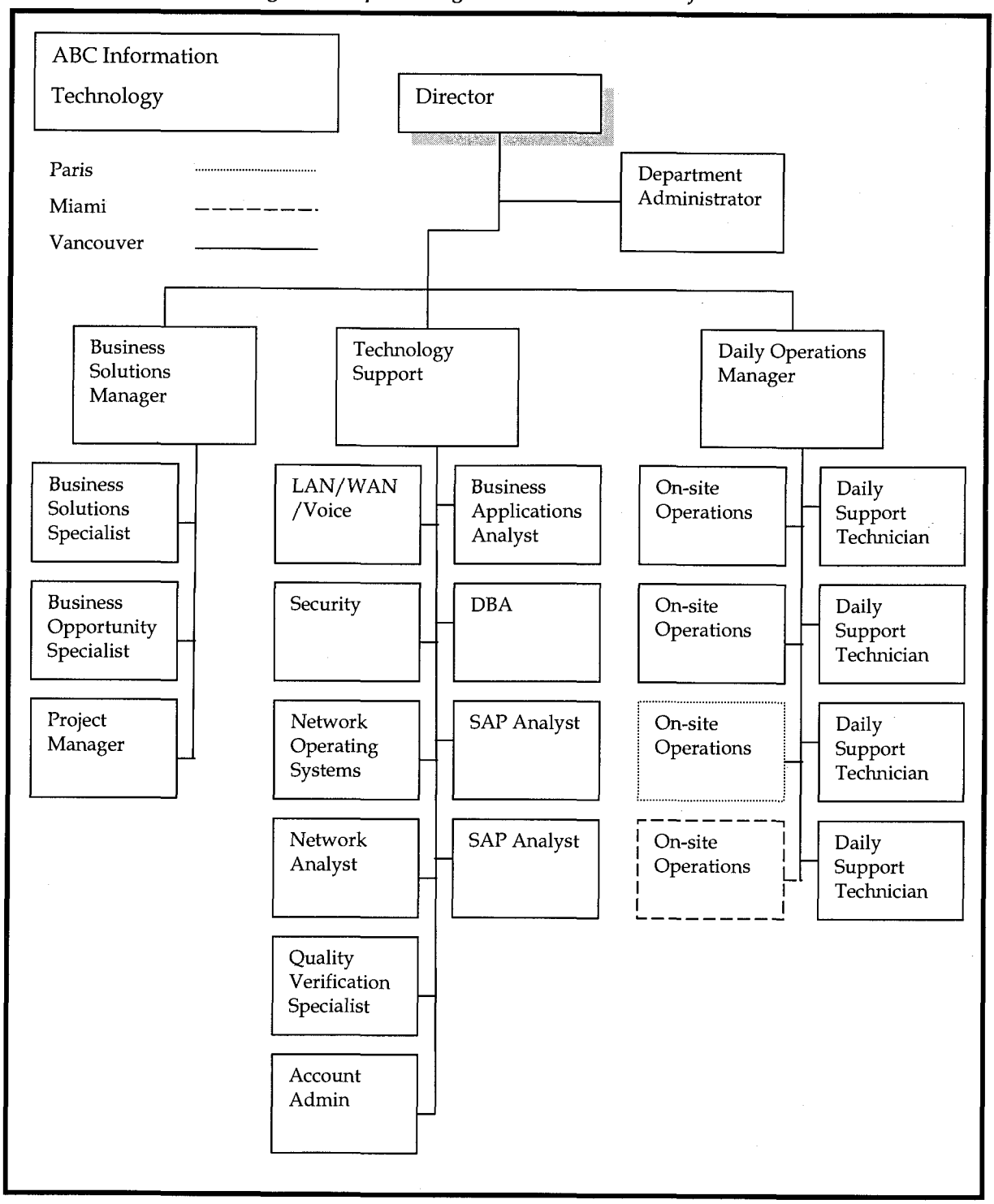
Operations, Technology Support and Business IT Solutions. These divisions will be discussed next.

Daily Operations

The Enterprise Service Desk, not detailed in Figure 4, will continue to be outsourced. The second level of support, desk-side Support, would become Daily Support and be charged with performing customer support, daily operations and maintenance tasks. This function will be supplied remotely, from the Winnipeg office.

Each site would have on-site support staff, which would work in conjunction with the Daily Support team. These hands-on technicians would perform physical inspections and other activities that require on-site personnel. Both these functions would be managed through a Daily Operations office located in Winnipeg.

Figure 4 Proposed Organizational Structure of ABC IT



Source: Author

Technology Support

To capitalize on economies of scale of internal resources, a Technology Support Division is required. This division would be comprised of IT personnel that have a depth of knowledge in specific areas of technology. Technology Support would operate as a knowledge pool that supports the Daily Operations and Business Solutions business units. Additionally, Technology Support would work to investigate solutions to existing problems and provide proactive IT solutions to avoid IT-related incidents.

Business Solutions

The new Business Solutions division is focused on investigating new solutions and executing projects that would add value to the ABC organization. Business Solutions personnel will have a business background. The division will have expertise and knowledge of the ABC business as well as general business practices. The Business Solutions division will be charged with working with Technology Support personnel to explore business opportunities and implement IT solutions.

This new organizational structure would allow for those IT personnel with a breadth of knowledge to work at operational tasks. At the same time, IT Personnel with more focused skills will have the opportunity to further develop these skills. This new model better utilizes individual skill-sets and is a more cost-effective solution as highly skilled and highly paid individuals have the opportunity to apply these skills. Specifically, this will ensure that IT personnel with skills in business or researching new technologies are not misused on activities that relate to incident resolution or other operational tasks. The following section details the skills specific to each new division.

6.2.4 Resulting Resource Changes

Ideally, the proposed organizational structure would result through the creation of new positions; thereby allowing more time for training and other activities. However, this is not possible under ABC IT's existing budgetary constraints. To maintain an employee head count and budget that meets financial requirements, the proposed organizational structure must achieve economies of scale by reducing the number of on-site personnel at ABC's remote office locations. These economies of scale come from the ability of new

technology to apply system-wide upgrades, remotely and relatively simultaneously. Therefore, a technician in Winnipeg would be able to upgrade all systems within ABC in as many hours as it would take three technicians, one at each site.

The goal of IT, in this regard, should be to achieve a ratio of one operations technician per 200 employees. Table 21 depicted the number of IT personnel by office location. With the allocation mentioned above, Miami, and Paris would be reduced to one on-site technician while Winnipeg would operate with only three on-site technicians. The number of Daily Support staff would possibly need to increase to meet the demands of performing the additional tasks of maintenance and daily operations.

The size of the Technical Support team would depend on the number of individuals it would take to ensure that certain required skills have been considered. The following list provides the skills that will be required in the proposed IT environment. The list assumes that the organization has migrated from the existing ERP system to a unified environment of SAP.

Hardware

- Security
- Network
- Servers
- Desktops and other peripherals
- Communications
- Operating systems
- Site infrastructure

Software

- ERP Analyst (once SAP is rolled out throughout the organization will only need to support one ERP)
- Desktop Applications, including Email
- Business Solutions Applications

- Data Warehousing, knowledge management
- Workgroup Applications
- Windows OS
- Unix/Linux

The Technology Support team would need to consist of individuals with more specialized skills. To afford uninterrupted service, IT should be able to "pick up the slack" during times when an employee is sick, away, or otherwise. The skills of individuals within the Technology Support team should combine to provide a broad selection of specific skills. This team would consist of approximately 10 members, but will depend on IT's ability to consider all of the above-mentioned skills.

For Business Solutions, the team must possess a variety of business skills. The team needs to be familiar with the ABC's business, to provide an understanding of IT Customers. Additionally, there is a need for general business skills, for preparing business cases, determining business value and executing projects successfully. Finally, this business unit must have experience in investigating technology-related opportunities.

This new organizational structure maintains the same head count as the existing IT organization. At the same time, the new structure reduces redundancy and shifts IT from a functional structure to a structure that reflects the needs of IT. Layoffs, employee retraining, or both, may undoubtedly occur as a result of ensuring that the proper skills are in place. Accordingly, employee morale will be a critical consideration.

6.2.5 Management Changes

As mentioned earlier, to successfully run IT as a business, IT must manage its product offering as a portfolio of services. The portfolio must contain services that can be categorized as Strategic, High Potential, Key Operational and Support. Currently, IT services fall under the headings of Key Operational and Support. These two areas need to be optimized to free up resources for the Strategic and High Potential categories.

Through standardization of the technological environment and centralization, a reduction in efforts of the Key Operational and Support portions of the portfolio can be achieved. As outlined in the section on Organizational Change, the new IT environment would require less IT personnel to work on these services.

The success of supplying Strategic and High Potential services will depend on Executive-level support and skills of IT personnel who support these services. An additional determinant of success will be will be the strength of the relationship between IT and the ABC business. The role of IT must also change from a purely support function to one of partnership with business and organizational strategy.

For IT to successfully meet the recommendations outlined in Section 6, many changes are needed. The focus and goal of these changes will be to assist the organization to reduce costs, support strategic objectives through the use of IT and align the incentives of IT Customers with the organization. Cost savings need to occur within individual departments and throughout the organization, as a whole. Many reductions in costs will be driven through efficiencies gained through the IT Function.

There are many changes necessary for ABC IT in meeting the goals of cost-reduction and creating an efficient market for IT products and services. The IT environment for ABC has already changed considerably over the last few years. Given its prior success in adapting to change, the ABC IT Function should be able to embrace the opportunities that lie ahead and effectively fulfil its objectives. By accomplishing this end, ABC IT will assume a greater role in bringing value to the global ABC enterprise.

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