

**INTERNAL IT STRATEGY
FOR XYZ SOLUTIONS INC.**

by

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ABSTRACT

XYZ Solutions Inc. is a rapidly growing IT services company based in Vancouver, British Columbia. Following a series of acquisitions, the company is expanding market share and developing internally. IT systems are instrumental in supporting corporate strategy and internal operations. XYZ's IT strategy currently focuses on developing these systems.

This analysis outlines enhancements to XYZ's existing IT strategy in order to strengthen the company's ability to utilize information technology. In developing these enhancements, the analysis reviews the history, structure, and strategies of XYZ and characterizes the current alignment between business objectives and internal R&D. Further to developing enhancement recommendations, the analysis provides an implementation plan to address key sources of business-IT misalignment. The enhancements to IT strategy are an opportunity for XYZ to develop a sustainable competitive advantage through improved planning, development, and usage of IT.

DEDICATION

This work is dedicated to Candice whose unwavering encouragement, motivation, and commitment made this project possible, and to my family whose understanding and steadfast support made my pursuit of the MBA a reality.

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GLOSSARY

CEO	chief executive officer
CIO	chief information officer
CRM	customer relationship management
CSF	critical success factor
CTO	chief technology officer
DCF	discounted cash flow
DNS	domain name system
DSL	digital subscriber line
ERP	enterprise resource planning
FTP	file transfer protocol
HR	human resources
IP	internet protocol
IRR	internal rate of return
ISP	internet service provider
IT	information technology
JIT	just-in-time
LAN	local area network
NPV	net present value
OEM	original equipment manufacturer
PBX	private branch exchange
PC	personal computer
R&D	research and development
ROI	return on investment
SLA	service level agreement
SMB	small-to-medium business
SME	small-to-medium enterprise
VAR	value added reseller
VOIP	voice over IP
VPN	virtual private network
WAN	wide area network

1 OVERVIEW OF INTERNAL IT STRATEGY AT XYZ

XYZ Solutions Inc. is a privately owned IT services company established in 2001 in Vancouver, British Columbia. The company provides IT services and consulting to the small-to-medium enterprise market. XYZ's offerings range from IT equipment sales to the design and installation of complex turnkey solutions.

XYZ experienced steady organic growth over the first three years of operation. In mid-2004, the company initiated an aggressive growth-by-acquisition strategy resulting in the buyout of three local IT companies. XYZ is presently aiming to increase working capital and maximize profitability from its relatively new larger customer base. Additionally, senior management acknowledges that establishing a framework for continued growth by developing scalable infrastructure, improving the quality of services, and increasing operational efficiency is a key priority in supporting continued growth.

IT underpins XYZ's core activities by providing essential systems, linking departments and contributing to the company's services portfolio through research and development activities. Sales, installations, integrations, and customer- and supplier-management all rely on XYZ's internal IT systems. Managed Services, such as data warehousing and web hosting, depend on in-house server clusters and monitoring software. The overall complexity of internal systems increased dramatically due to the recent acquisitions. XYZ has articulated an internal IT strategy to support continued growth and seeks to develop this strategy further.

This paper presents a strategic internal IT plan for XYZ. The plan analyzes the company and environment, and provides an assessment of existing internal IT strategy. The supporting analysis examines what enhancements to IT strategy will deliver value to XYZ, promote business and IT strategic alignment, and support overall corporate objectives. The plan develops strategic IT recommendations and provides a corresponding implementation approach.

1.1 Why Develop An Internal IT Strategy for XYZ?

With the increasing reliance upon information and knowledge in the current business environment, organizations are increasingly dependent upon IT (Van Grembergen, De Haes, & Guldentops, 2004). Information technology is now a requisite capability for firms to maintain a competitive position in many industries. Firms in the IT services industry, with their close proximity to information technology hardware and software, are especially well placed to take advantage of IT innovation.

As XYZ grows, internal IT strategy will be increasingly important in supporting the company's organizational and business environment. A well-defined IT strategy supports corporate objectives, adds value to the company, and enhances the company's ability to compete effectively. The "productivity paradox" of why IT has faced challenges in providing measurable business value further identifies the importance of internal IT strategy (Van Grembergen et al., 2004).

Following the recent acquisitions, XYZ updated their internal IT strategy to focus on the new challenges of the larger and more complex organizational environment. A key priority of internal IT strategy is reducing internal systems complexity. Senior

management also identifies streamlining the role of internal systems in the company's value chain, and developing the capabilities of these systems to maximize revenue from the larger post-acquisition customer base as strategic IT objectives. The overlap between internal systems and saleable services further motivates the need to develop internal IT strategy.

1.2 Approach Used in this Analysis

Development of an internal strategic IT plan for XYZ requires an important distinction between internal IT and the company's overall use of IT. Internal IT is defined here as the technologies, processes, and initiatives that support internal activities. The term *IT strategy* hereafter indicates an internal context. Additionally, *internal-R&D* indicates research and development for internal systems. In contrast, *services-R&D* applies to research and development specifically for saleable services.

R&D includes the design, initial development, and refinement of all types of IT systems – hardware and software inclusive. This analysis does not directly assess XYZ's positioning strategy but does examine its impact on IT strategy and R&D activities.

Initial background information on XYZ discusses the company's history, ownership, supply chain, intra-firm product flow, and the value chain. XYZ's services incorporate IT and many have their origin as internal systems, necessitating an understanding of the company's services portfolio and market position. A snapshot of the IT services industry identifies competitors and industry trends. Company background concludes with an overview of organizational structure and current strategy.

A subsequent discussion of internal IT examines physical infrastructure, software systems, and current initiatives in detail. Further IT information includes a look at XYZ's planning and governance for internal systems development.

An analysis of XYZ's IT strategy follows the IT discussion. The analysis examines current IT strategy to assess the present and expected performance of the company's internal-R&D. The analysis characterizes the alignment between business and IT in order to identify the key challenges facing IT strategy at XYZ.

The plan concludes with recommendations to optimize XYZ's existing IT strategy. Recommendations seek to address critical issues while supporting the company's corporate objectives. An implementation sub-section outlines an action plan to support strategic recommendations.

2 INTRODUCTION TO XYZ SOLUTIONS INC.

XYZ Solutions Inc. (XYZ) is an IT services company providing solutions to small-to-medium (SME) firms seeking to outsource their IT functions. XYZ offers consulting, design, implementation, and support of IT solutions. Areas of expertise include networking, storage, connectivity, and telecommunications solutions. With two Vancouver locations, XYZ serves customers throughout the Vancouver Lower Mainland, Fraser Valley, and Gulf Islands regions. A small number of customers are located throughout central and eastern Canada, the U.S. and overseas. XYZ is a privately owned company that is growing rapidly following their existing growth-by-acquisition strategy. XYZ's broad services portfolio and comprehensive in-house approach to IT services affords them a unique competitive position in the local SME IT services market. The majority of the company's business involves incorporating IT equipment and boxed software into value-added solutions. XYZ uses the terms value-added reseller (VAR), IT services provider, systems integrator, and solutions provider interchangeably to describe their business. The company has strategic alliances with several local and regional IT-related firms. Projected revenues for 2005 are CDN\$5 million. XYZ's vision is to become the leading IT services company to the Western Canadian SME market by 2010.

2.1 Company History

The present owners founded XYZ in a turbulent and cooling IT services market. The company grew steadily and organically over the next three years. Following the

relative recovery of the technology sector, XYZ initiated a growth-by-acquisition strategy and expanded dramatically over 12 months.

Significant events in the evolution of the company include:

- Feb 2001 Founded in Vancouver, British Columbia.
- June 2002 Secured carrier-grade internet access from Shaw Cablesystems.
- Mar 2004 Secured strategic alliance with Metrospan Networks, Vancouver.
- May 2004 Initiated growth-by-acquisition plan.
- Nov 2004 Acquired NetMind Inc., Vancouver, \$0.4M.
- Mar 2005 Purchased Callisto (custom order-management/ERP system).
- June 2005 Acquired Veroso Solutions Inc., North Vancouver, \$0.75M.
- Aug 2005 Acquired Perception Technologies Inc., Vancouver, \$0.45M.

2.2 Ownership

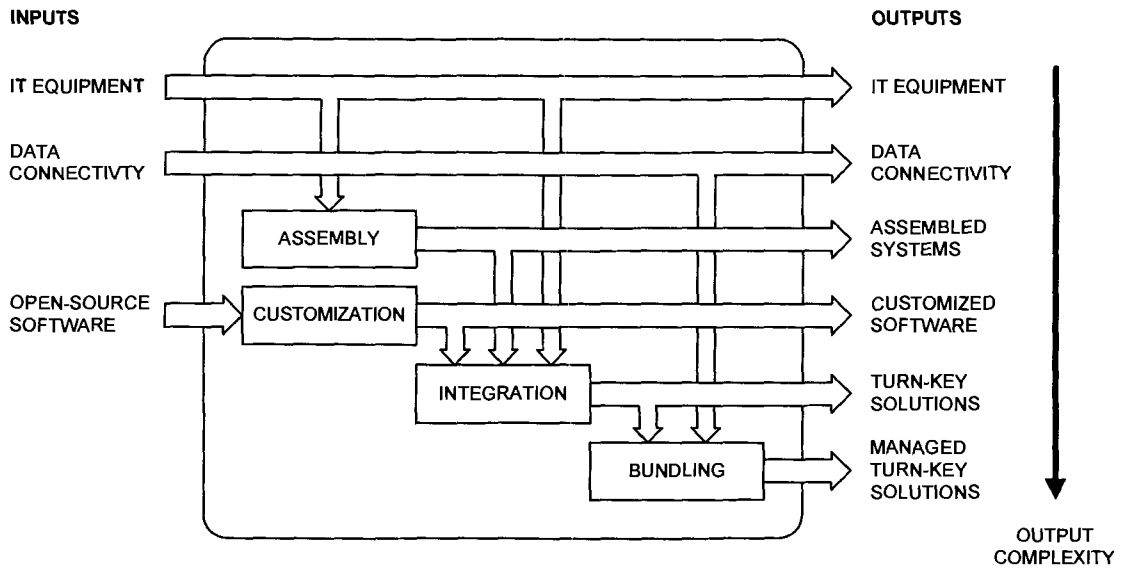
XYZ is a privately owned company with the President holding approximately 70% of preferred shares. Remaining ownership is distributed among various investor groups. The company is primarily owner-controlled.

2.3 Product Flow and the Supply Chain

XYZ procures data connectivity, IT equipment, and open-source software from three distinct types of suppliers. The company sells data connectivity, assembled servers and workstations, and software solutions incorporating customized open-source tools to customers. XYZ retails IT equipment and boxed-software and supplies turnkey

integrated systems that combine equipment, assembled servers, and customized open-source technology (Figure 1). XYZ does not manufacture its own hardware or boxed software but does develop websites and custom software applications.

Figure 1: XYZ Inputs, Outputs, and Product Flow.



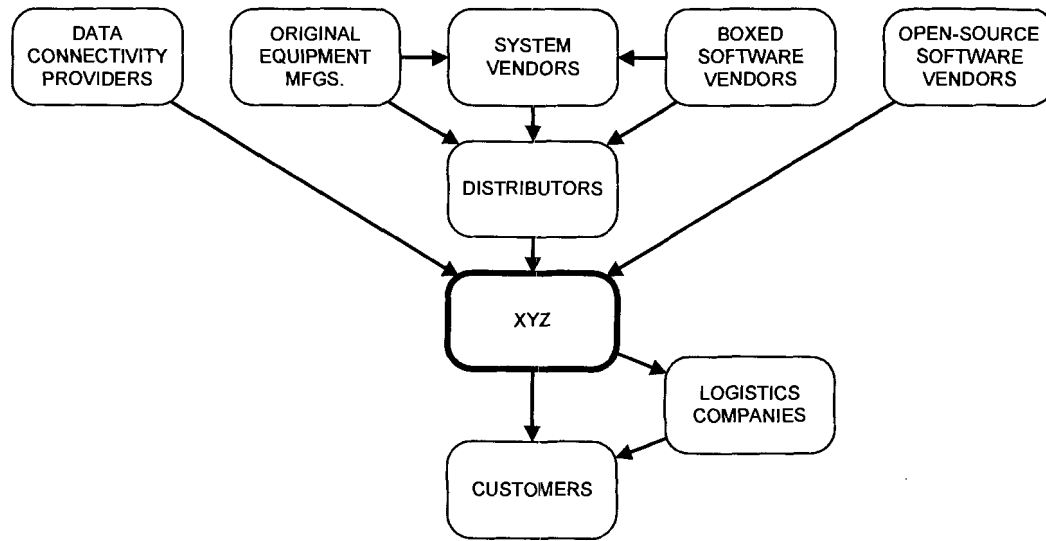
Source: author.

A single local vendor supplies data connectivity via a “carrier-grade” high-speed internet feed. With no inventory or logistics costs, data connectivity is distinct in the supply chain. However challenges in data connectivity supply exist in the form of vendor downtime and peak customer demand.

Open-source software tools underpin several in-house and service-oriented integrated solutions, such as corporate VOIP systems. Open-source software has minimal impact upon the supply chain given the absence of procurement, holding, or logistics factors.

In-house assembly of workstations and servers is the extent of vertical integration in the supply chain. The company relies on well-defined distribution channels and uses third-party logistics extensively. Figure 2 provides an overview of XYZ's supply chain.

Figure 2: XYZ Supply Chain.



Source: author.

2.4 How XYZ Creates Value

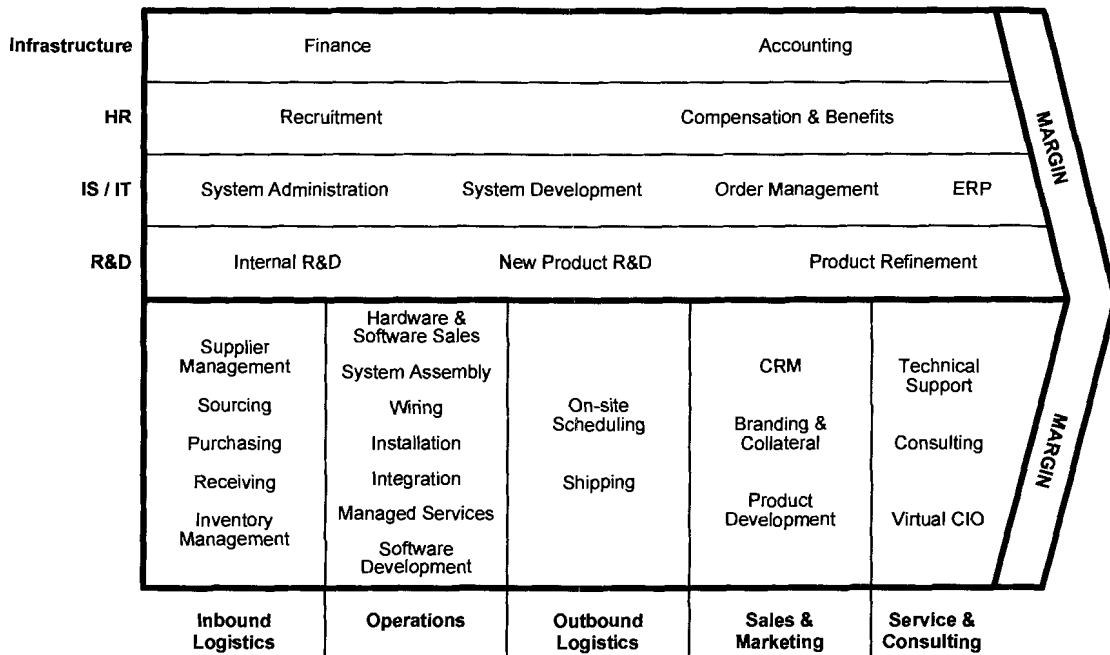
XYZ creates value by integrating technologies and expertise from distinct fields of IT to deliver holistic internal and customer solutions. The company bills itself as a “one-stop” IT services company, exhibiting significant horizontal integration within an IT context. Although XYZ prefers developing internal capabilities to outsourcing, the company does not preclude the use of external vendors for specialized domain expertise. The preferred approach, however, is to bring capabilities that align with corporate objectives in-house.

A key contributor to value generation is the company's custom internal software, Callisto. This mission-critical system integrates enterprise resource planning (ERP),

order-management, and customer relationship management (CRM) functionality into a company-wide web application. Callisto is used throughout the organization and is the focus of ongoing development.

An overview of XYZ’s value chain examines primary and supporting activities throughout the organization (Figure 3). Technical support and consulting are “service” activities in the traditional value chain sense (Porter & Millar, 1985) but are distinct from operations activities that provide saleable services to customers. Information systems and information technology are key supporting activities given their critical role throughout the organization.

Figure 3: XYZ Value Chain.



Source: author.

2.4.1 Primary Activities

2.4.1.1 Inbound Logistics

With over 40% of revenue attributable to hardware and boxed software sales, procurement activities are critical in building value for the company. Short product life cycles, rapid industry innovation, and demanding customer requirements produce a complex and dynamic procurement environment. XYZ adds value to supplier-management, sourcing, and purchasing by monitoring distributors on a daily basis to minimize costs. The purchasing function performs much of supplier-management manually; ERP integration with distributors is a pending IT objective.

Procurement delays affect installation timing and ultimately customer activities, more so for large integrated solutions. Complex systems may require shipments from several geographically dispersed suppliers; the rapid rate of depreciation typical of IT equipment exacerbates any holding costs arising from staggered delivery. Purchasing functions further add value to procurement through careful coordination of third-party inbound logistics to minimize delivery inefficiencies.

XYZ incorporates the practice of fully serialized inventory. An internal serial number and corresponding barcode uniquely identify received goods – from cables to enterprise servers. Serialized inventory improves the accuracy and accountability of all aspects of inventory management throughout the value chain. This level of inventory management sophistication affords the company a measure of competitive advantage.

To mitigate inventory depreciation, XYZ borrows from just-in-time (JIT) philosophy by aggressively minimizing in-stock quantities. Maintaining acceptable

customer lead times is challenging with this approach, hence the motivation to add supplier integration to Callisto.

2.4.1.2 Operations

Operations activities comprise hardware and software sales, network wiring, system assembly and installation, and integration of installed systems with customers' existing infrastructure. Operations activities also include custom software development, website development, and the provision of Managed Services.

XYZ adds value to operations activities with Callisto's order-management and ERP integration. Callisto permits precise workflow management, inventory-to-order fulfilment, and labour tracking, which in turn increases work order accuracy and lowers operating costs. Changes to workflow processes resulting from the recent acquisitions have created functional gaps in Callisto's order-management capabilities. Achieving closer alignment between Callisto and workflow processes is an IT initiative.

XYZ leverages communications technology to add additional value to operations activities. Replacing cellular phones with Blackberry devices minimizes marginal communications costs and reduces technician response time.

Software development is a relatively new addition to operations. A separate department performs these activities and adds value through structured formal project management processes.

XYZ creates Managed Services value through the integration of monitoring tools with Blackberry notification. Automatic notification alerts in the event of downtime improve overall service quality.

2.4.1.3 Outbound Logistics

Outbound logistics activities comprise the scheduling of wiring, installation and integration jobs, and transportation of physical goods to customers' locations. XYZ relies on third-party logistics firms to deliver IT equipment not requiring installation services. XYZ adds value with precise scheduling using Microsoft Outlook/Exchange calendaring. Coordinating outbound logistics with inbound shipments and unpredictable customer schedules poses challenges during high-volume periods. The sophistication required to add comprehensive scheduling capabilities to Callisto has thus far precluded the development of this functionality.

2.4.1.4 Sales & Marketing

Sales and marketing activities consist of promotion, forecasting, and all aspects of CRM. Sales and marketing also perform brand development and prepare collateral marketing tools such as printed promotional materials and the corporate website.

XYZ combines sales and purchasing functions in the same department, thus achieving tighter control over customer scheduling. Callisto's customer-management capabilities allow the sales department to personalize and therefore build higher quality relationships with clientele. Additionally, Callisto's ERP integration extends the company's ability to identify cross-selling opportunities. XYZ believes that cross selling is a key source of revenue generation.

XYZ further uses integration as an important value driver for sales activities. The sales department seeks to develop an understanding of how internal-R&D translates into customer revenue streams. Conversely, Internal Operations management uses sales information, particularly customer preferences and demand, as valuable inputs to R&D.

2.4.1.5 Service

Consulting and technical support have a secondary relationship with services-related operations. XYZ provides consulting as a standalone service and as part of complex projects. The senior management team and sales staff generally perform consulting assignments and continually strive to improve the proactive quality of consulting. To achieve this objective, they leverage Callisto's company-wide information accessibility to enable collaboration between with technical departments.

Technical support activities typically involve software-based troubleshooting of customer systems and installations. XYZ outsources all but the most basic hardware repairs. The company combines operations and technical support activities in the same department, streamlining communications and saving costs through process and technology reuse.

Technical support falls under three categories: in-shop, on-site, and remote support. XYZ uses Callisto's functionality to add value to all types of support. Using Callisto, technical support staff can quickly obtain historical data for equipment, customers, and suppliers. Limited asset-tracking functionality in Callisto adds value to the support of customers' existing or legacy systems.

XYZ leverages the Internet to add value to on-site and remote support activities. As a web application, Callisto is accessible over the Internet through a standard web browser. This feature adds significant efficiency to on-site support activities as technical staff have access to the same information available internally. Technical staff frequently use remote access capabilities to diagnose and solve problems on customer servers and workstations. Remote access to the company network further reduces communication

overhead and improves support quality. XYZ places a high priority on internal network security and controls remote access accordingly.

2.4.2 Supporting Activities

2.4.2.1 Infrastructure

Infrastructure includes finance and accounting functions. The acquisitions produced a significant increase in the magnitude and complexity of finance and accounting. Recent integration between Callisto and accounting software has increased the efficiency of accounting functions. Primary goals of the finance function are consolidating post-acquisition company financials, and establishing and revising accounting processes to support the growing business environment.

2.4.2.2 Human Resources

XYZ's need to add staff, in line with their growth strategy, places greater emphasis on human resource functions. The company does not use external hiring agencies, preferring to retain control of HR processes in order to ensure a good fit with corporate culture. Senior management has identified the need for a dedicated HR function whose role will be to design and review incentive systems, develop policies, and create HR frameworks to support continued growth.

2.4.2.3 IS/IT

Information systems and information technology are the lifeblood of XYZ. The company is highly dependent upon computing hardware infrastructure and software systems. Internal software systems span all departments and support all value chain activities. Saleable services also incorporate IT.

XYZ creates IT value chiefly through integration. The company seeks to combine technologies to deliver business functionality, solve technical problems, and create new service offerings. The synergy resulting from integration provides a competitive advantage in the case of internal systems, and increases the functionality and value of service offerings.

From an internal perspective, XYZ adds value with company-wide standardization of basic tools such as email and desktop productivity software. The company realizes further value through Callisto, the company's ubiquitous internal management software. Accounting systems and the administration of Managed Services use IT. Even the company's corporate phone system uses VOIP technology: making a telephone call from within XYZ uses IT. The company has integrated several key internal systems but much additional integration value remains unrealized.

XYZ faces several challenges to IT value creation. As the company grows and strives to stay competitive, the complexity of business solutions required from IT rises. Information usability and accessibility requirements become more demanding and information management needs grow. System upgrades and staff training are necessary to keep pace with emerging technologies. XYZ has many opportunities to generate greater value from IT and will need to expend considerable effort in maintaining existing levels of value creation.

2.4.2.4 R&D

Research and development provides new internal systems and service offerings. In 2004 XYZ allocated approximately 10% of gross revenue to formal R&D. The company supports R&D on three levels: internal, services-related, and "implicit" R&D

that builds the company's knowledge and skill base for greater operational capability. XYZ captures value from these activities by encouraging a free-flow of technical ideas within and across departments. This diffusion of information improves learning, creates creative opportunities, and potentially improves the reliability of systems and processes through peer-review.

Services-R&D activities focus on developing turnkey systems, automating Managed Services, and customizing and integrating open-source software. Industry trends and customer demand drive services-R&D. XYZ adds value by seeking pilot customers for new services. Such customers receive a system in the testing stage, albeit at a significant discount, while XYZ saves on development costs and gains the opportunity to optimize the system in an external environment. Although primarily performed by the Internal Operations department, services-R&D may draw upon Technical Operations for specialized expertise.

Internal-R&D activities involve modifying and optimizing the company's network topology, and developing the functionality and integration capabilities of internal software systems. The Internal Operations department performs Internal-R&D. XYZ realizes significant value from Internal-R&D through overlapping internal and services development. In fact, many saleable services at XYZ begin as internal systems. The company first used VOIP solutions and bandwidth monitoring systems internally, subsequently adding them to the services portfolio in response to customer demand. Transforming internal systems so that they work in customer environments may require improvements to robustness or ease-of-use. Understanding the functional and usability

limitations of internal systems is an important capability for Internal Operations and Technical Operations management and one that XYZ is seeking to develop.

By leveraging the continuous learning culture of the organization, XYZ implicitly adds value to R&D. All employees are encouraged to acquire new knowledge and keep informed of industry innovation. The company incorporates even the smallest advances in skills and knowledge into services and internal systems on a daily basis.

2.4.3 XYZ's Core Competencies

XYZ identifies four core competencies that afford the company a unique position and therefore relative advantage in the local IT services industry. These core competencies are:

- A broad range of services with minimal reliance on outsourcing;
- Novel and effective integration capabilities;
- The ability to efficiently cross-sell; and,
- Web-accessible integrated ERP, order-management, and CRM functionality available across the company.

XYZ's ability to offer a comprehensive line of services with minimal outsourcing is unique in the local market. This ability is complementary with the company's integration capabilities and together signals an ability to innovate and attract talent. While creative, integration efforts rely upon open standards and are subject to emulation.

Cross-selling efficiency complements the company's comprehensive services portfolio and is partly enabled by Callisto's integration capabilities. Effective cross

selling requires building trust through customer relationships and is therefore more difficult to imitate.

Web-accessibility of integrated ERP, order-management, and CRM functionality available company-wide is clear source of competitive advantage. XYZ's advantage lies in their proficiency in adapting Callisto to their needs. The combination of software functionality and customizability are the source of Callisto's business value and are a costly and time-consuming mix for competitors to copy. However, Callisto relies upon open standards thus its functionality can be duplicated.

The imitability of XYZ's core competencies combined with the rapid innovation characteristic of the IT industry suggests that the company's competitive advantage is not sustainable.

2.5 XYZ as a One-stop IT Services Provider

2.5.1 XYZ's Service Portfolio

2.5.1.1 Professional Services

Professional Services encapsulate the design and implementation of solutions within various branches of IT. XYZ groups Professional Services into several broad categories. Hybrid services combining elements of one or more categories are also possible. These categories are as follows:

- *Hardware and Software Sales* refer to retail sales of IT equipment and boxed software. IT equipment includes workstations, servers, peripherals, and networking hardware.

- *Physical Implementation* includes the installation of physical goods that supplement computer network systems, such as air conditioning, equipment racks, and raised flooring.
- *Security* involves the design and installation of specialized hardware and software to control access to customers' networks. XYZ's security solutions range from the installation of consumer firewall devices to complex custom-built firewall servers with sophisticated monitoring software.
- *Network Implementation* concerns the design and installation of computer networks. This service may include any combination of topology design (the schematic arrangement of network components), installation of physical wiring, installation of wireless devices, and software configuration. Network Implementation may also require configuration of user accounts, security settings, storage systems, and backup systems.
- *Network Maintenance & Support* includes the upkeep of customers' networks including those not originally provided by XYZ. This service may include periodic hardware and software upgrades, backup, data recovery, user account administration, and general troubleshooting.
- *Connectivity Implementation* is the installation of data connectivity solutions, namely DSL. This service includes the sale and configuration of appropriate networking hardware and ongoing provision of bandwidth.

- *Telephony Implementation* is the design and installation of corporate telephone systems based on conventional phone technology. Sales of telephone hardware may be included in this service.
- *VOIP Implementation* comprises the design and installation of VOIP phone systems in corporate environments. Installations include networking hardware, customized VOIP management software, and integration with customers' existing data connectivity.
- *CCTV Implementation* is the design and installation of closed-circuit television systems for video surveillance. XYZ offers web-enabled viewing capabilities with this service.
- *Pay-per-use Services* refer to any piecemeal services provided by XYZ that are not part of larger projects. These services are typically support-related and encompass all of XYZ's Professional Services.
- *Consulting Services* are offered independently or included in larger or more complex projects. Consulting services span XYZ's complete range of IT capabilities and typically focus on planning or infrastructure auditing. Virtual CIO is a specialized form of consulting for companies seeking to outsource the role of chief information officer in an IT context. Virtual CIO involves a consistent and single point of contact for customers. This sub-service enhances the role of customer account manager with an understanding of the customer's business, value chain, and industry, coupled with knowledge of IT industry trends. The object of the Virtual CIO is to provide maximum

business ROI to customers and to serve as a comprehensive delivery mechanism for XYZ's full range of services.

2.5.1.2 Managed Services

XYZ broadly defines Managed Services as a collection of continuous IT services that include proactive application and infrastructure management, and operate independently of customer HR or IT resources. XYZ's Managed Services target businesses seeking to outsource mission-critical IT services while achieving greater technical sophistication and lower overall cost than in-house solutions. Managed Services comprise the following categories:

- *Internet Services* include hosting for web sites, email, databases, and e-commerce. XYZ provides remote management and reporting for all types of hosting and adds spam filtering and anti-virus functionality to email hosting. Additional Internet Services include secure virtual-private network (VPN) and managed wide-area network (WAN) solutions. The company takes responsibility for hardware and software upgrades, data backup, and security.
- *Data Services* include administration and management of data backup and network-attached-storage at customers' locations. Data Services also includes high-volume data vaulting at XYZ's head-office facility.
- *Co-location Services* involve the physical placement of a customer-owned server in XYZ's facility. XYZ provides connectivity to their high-speed Internet connection in addition to backup services.

- *Flat-rate Technical Support* is available for XYZ's entire range of IT services. Network support is the most common type of technical support although more specialized forms are possible. Flat-rate technical support contracts take the form of service level agreements (SLAs). Various levels of support are available ranging from next business day to 24/7 one-hour response.

2.5.1.3 Software Development

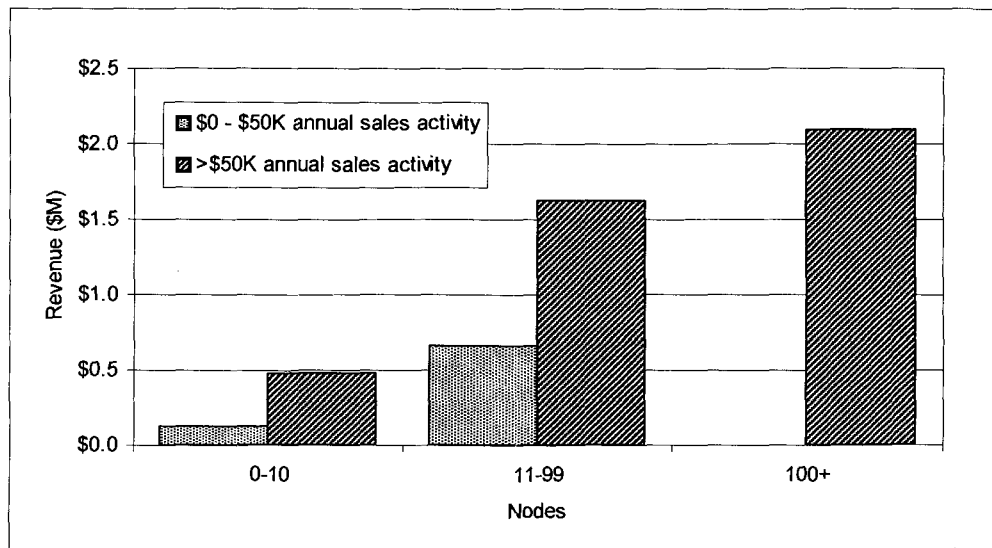
XYZ's software development capabilities focus on website and web application development. The company also provides limited development of kiosk software, desktop and web applications, and application integration. Software projects are one-off undertakings for particular customers. The low volume and custom nature of the company's software development limit technology reuse. The company does not produce boxed software products or develop enterprise software applications for customers.

2.5.2 XYZ's Customers

XYZ targets SME customers across all industries. The company classifies SME customers as those with less than 500 or fewer employees. More accurately, XYZ considers the number of nodes, or individual computer systems required in a customer network. Node count provides a more useful reflection of service requirements as organizations may not have a unitary relationship between employees and computers. Customers with high-node networks typically use many IT systems, have significant interdependencies between these systems, require advanced security, and need support to match. Added network complexity places an emphasis on more sophisticated implementation and support solutions.

XYZ broadly segments customers based on sales activity and number of network nodes, considering customers with over \$50,000 in sales activity as high-revenue (Figure 4). XYZ retains high-revenue customers with premium support contracts and proactive account-management services.

Figure 4: XYZ 2005 Gross Revenue By Customer Segment.



Source: author, from data provided by VP Technical Operations, XYZ Solutions Inc., October 2005.

The company recognizes the following customer segments:

- *Small-Office Home-Office (SOHO)*. Customers in this segment engage in up to \$50,000 in annual sales activity with XYZ (low-revenue customers) and have networks consisting of 0 to 10 nodes. These customers may exhibit price-sensitivity.
- *Small Business (SB)*. This segment comprises low-revenue customers with networks comprising 11 to 100 nodes and typically static or highly stable IT infrastructures, or an alternative primary IT services provider. Customers

with larger networks may have in-house IT departments. Additionally, customers in this segment may be price-sensitive if requiring high-volume.

- *Medium Business (MB)*. These customers are similar to those in the SB segment but with networks in excess of 100 nodes. The likelihood of an in-house IT department or alternative primary IT services provider is high for these customers.
- *Specialized*. Customers in this segment engage in \$50,000 or more in annual sales activity with XYZ (high-revenue customers) and have networks consisting of 0 to 10 nodes. These customers tend to be quality-sensitive and may require highly specialized niche IT solutions.
- *Small Enterprise (SE)*. This segment comprises high-revenue customers with networks comprising 11 to 100 nodes. Such customers are typically quality-sensitive and place high value on post-sales support, systems integration quality, and business ROI. This segment is XYZ's main source of revenue.
- *Medium Enterprise (ME)*. Customers are similar to those in the SE segment but with networks in excess of 100 nodes. XYZ seeks to increase market share in this profitable segment.

XYZ's customer segment labels are not wholly descriptive of constituent customers, but rather a characterization of customer commonalities. Senior management establishes revenue and node boundaries based on segmentation commonly used in the IT services industry. XYZ generally does not target customers with greater than 500 node

networks as the company has difficulty in remaining competitive for networks of this complexity. XYZ recognizes that industries have unique IT requirements and seeks to add industry segmentation to its positioning strategy.

2.5.3 How XYZ is Expanding Market Share

XYZ offers its complete range of services across all customer segments.

However, demand for the company's services is non-homogenous across segments.

Product-customer matrices provide insights into positioning strategy through a deeper understanding of the relationship between a company's products and customers

(Boardman & Vining, 1996). A *service-customer matrix* (SCM) for XYZ lists services and corresponding 2005 revenues for each customer segment (Table 1).

Table 1: Service-Customer Matrix.

(2005 Revenue \$000s)	Customers						Total
	Low-revenue (\$0 - \$50K/yr.)			High-revenue (>\$50K/yr.)			
	0-10 nodes	11-100	>100	0-10 nodes	11-100	>100	
Services	SOHO	SB	MB	Specialized	SE	ME	
Professional Services							
Hardware/Software Sales	\$100	\$250		\$250	\$500	\$1,000	\$2,100
Network Implementation		\$100		\$100	\$300	\$500	\$1,000
Network Maintenance & Support	\$20	\$250			\$250	\$250	\$770
Physical Implementation		\$10			\$150	\$100	\$260
Security	\$5	\$25			\$50	\$50	\$130
Consulting					\$35		\$35
Telephony Implementation							
VOIP Implementation					\$125		\$125
CCTV Implementation						\$200	\$200
Managed Services							
Hosted Services	\$5	\$10		\$15	\$25		\$55
Data Warehousing					\$10		\$10
Co-location		\$10			\$20		\$30
Flat-rate Service Support				\$50	\$100		\$150
Software Development							
				\$60	\$60		\$120
Total	\$130	\$655	\$0	\$475	\$1,625	\$2,100	\$4,985

Source: author, from data provided by VP Technical Operations, XYZ Solutions Inc., October 2005.

XYZ competes using a differentiation strategy, adding value to services through integration expertise and through high-quality customer relationships. Hardware and software sales are the primary source of revenue for the company and are primarily conducted in conjunction with other Professional Services.

Revenue generation occurs around SE and ME network segments for Network Implementation and related services. Revenues are also concentrated in similar services for the SB segment, and in Managed Services for the SE segment. Network Implementation and Network Maintenance & Support are the dominant revenue generating services across all segments.

The bulk of XYZ customers occupy SB and SE segments; the SB segment is the most populous. However, the SE segment provides the majority of aggregate revenue across all services due to more complex IT requirements and larger budgets. These customers generally regard the outsourcing of Managed Services as more cost effective than in-house solutions. XYZ's differentiation strategy leverages the company's reputation with long-term customers to sell additional services. XYZ's ability to deliver security, consulting, and VOIP services to the SE segment is testament to the company's reputation with these customers.

XYZ's post-acquisition capabilities recently provided the firm with the ability to target the ME segment. XYZ leverages its strength in Network Implementation and related services to generate significant revenue from ME customers. These customers typically possess a higher awareness of IT's role in the organization, have a greater understanding of the relationship between IT and business ROI, and demand higher reliability from infrastructure. Such customers are also likely to require advanced

Managed Services and support agreements – both an ongoing source of revenue. XYZ’s positioning strategy seeks to shift primary revenue generation to this segment.

A notable gap in the SCM is the MB segment. The use of in-house or competing IT service providers typically precludes revenue from these customers. Alternatively, MB customers may demand low-cost high-volume solutions. Competing effectively therefore requires a cost approach, not in line with XYZ’s positioning strategy. The Specialized segment is another significant gap in the SCM. This segment provides a modicum of revenue but does not have sufficient IT requirements to contribute significantly to XYZ’s growth.

VOIP, CCTV, and Traditional Telephony offerings are relatively recent additions to the company’s services portfolio. XYZ is streamlining these offerings and expects further revenue especially in the mainstay SE and target ME segments. In particular, XYZ expects an overall increase in VOIP revenue as awareness of the technology increases.

Software Development services generate minor revenue at XYZ predominantly through web application development for existing high-revenue customers. The company frequently provides Software Development services to extend the “one-stop” image of the company to high-revenue customers. XYZ has no immediate plans to boost revenue for this service. Without the capability to develop enterprise software for customers, the company does not expect significant revenue from the ME segment.

In summary, XYZ’s service-customer matrix reflects the company’s strengths in Network Implementation. Related services, such Network Maintenance & Support and Physical Implementation, enjoy significant revenue given their interdependency. High

revenue for Hardware and Software sales reflects the underlying nature of this service in XYZ's business. Existing high-revenue customers are XYZ's mainstay. The company aims to scale up all services in order to generate greater revenue from customers with larger IT infrastructure.

2.6 A Snapshot of the IT Services Industry

The IT services industry includes providers of information technology services and consulting, systems integration services, and information management services. According to the Gartner Research Group, global spending on IT services was US\$607.8 billion in 2005, an increase of 6.7% from 2004 (*CBR Top 50 IT Services Vendors*, n.d.). Major industry growth drivers include the move towards electronic payment systems and higher Internet security ("IT Industry Services Profile: Global", 2005). Industry giants, or first-tier IT services firms, such as IBM Global Services, EDS Corp., and HP Services, account for over 15% of global market share ("IT Industry Services Profile: Global", 2005). However, second-tier companies – providing a narrower range of services at the regional or national level – dominate the industry (*CBR Top 50 IT Services Vendors*, n.d.). CGI Group Inc. is one such second-tier company and the largest Canadian IT services firm, with 2004 revenues of approximately CDN\$3.2 billion (*CBR Top 50 IT Services Vendors*, n.d.). Other North American second-tier companies include Syscom, Microserve, Insight, and BurntSand. XYZ provides similar services as these firms.

With the continuing commoditization of information technology, IT services margins are decreasing. Serge Godin, founder of CGI Group, counters that while IT services may be undergoing commoditization, the industry is moving towards differentiated business transformation services (Slofstra, 2005). As IT services

specialize, economies of learning, knowledge of customers' industries, and company reputation become increasingly important for IT services firms. Established customers prefer larger established IT services companies ("IT Industry Services Profile: Global", 2005). Skilled labour remains a significant industry cost driver explaining the sharp growth of offshore vendors such as Tata Consulting (*CBR Top 50 IT Services Vendors*, n.d.).

XYZ focuses on the small-to-medium business/enterprise market, defined as businesses with 500 or less employees (*Net Impact Study Canada*, 2002). IDC Research states that Canadian small-to-medium businesses spend approximately \$8.96 billion each year on hardware, software, and IT services (Tournemille, 2004). Some reports indicate this figure will grow by 3.4% (Tournemille, 2004). IT services account for an increasing proportion of customers' total spending with the breadth and specialization of services likely increasing to meet evolving customer requirements. Growth in IT services demand may result from businesses upgrading internal systems and streamlining processes to stay competitive. Greater business accountability across industries drives the need for greater IT spending accountability. Outsourced IT services are an opportunity for customers to evaluate business ROI while minimizing in-house costs. A growing awareness of traditionally high switching costs prompts IT services companies to relieve customer lock-in by considering open standards, best practice guidelines, and integration into their solutions (*Sun Managed Services*, n.d.).

Suppliers to the IT services industry include distributors and manufacturers of computing and network hardware, software vendors and system builders. With increasing commoditization of IT goods, supplier margins are decreasing, leaving IT

services companies little choice but to add value through differentiation. XYZ relies on local distributors such as Ingram Micro and Tech Data. Access to these distribution channels is straightforward although switching costs imposed by a limited number of regional distributors constrain the flexibility of smaller IT service providers.

The prevalence of information technology sees increasing diversification of companies into the IT services industry (“IT Industry Services Profile: Global”, 2005). Telecommunications firms, in particular, are reacting to the emergence of IP telephony by adding IT services to their portfolio (Buckler, 2004). These companies are well placed to offer managed services and have sufficient resources to expand into infrastructure management, professional services, and consulting. XYZ’s competition includes North American Telecom Group, ALGO, DTM, and Telus. IT services account for at least 7% of Telus’ revenue (Buckler, 2004). First-tier providers, notably IBM Global Services, continue to represent the most significant threat to SME IT service companies. However, first-tier firms face the challenge of delivering customized solutions at price points competitive with second-tier firms.

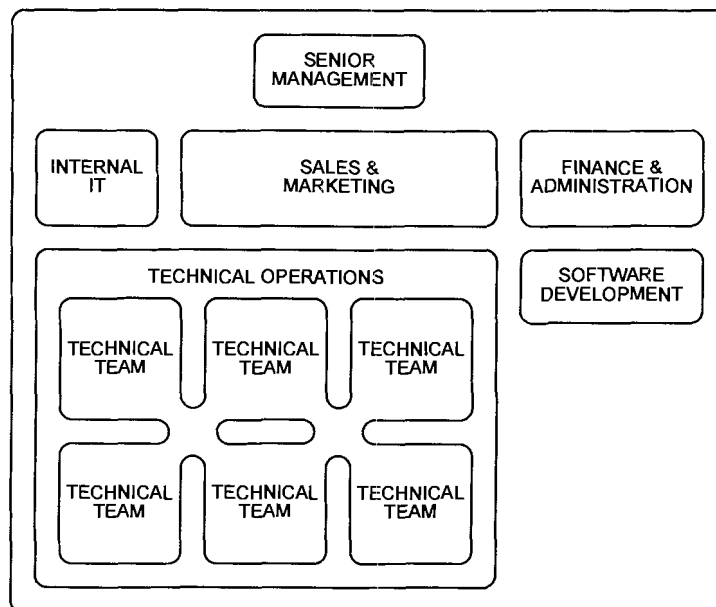
Industry trends include an increased focus on IT services outsourcing. CGI Group estimates a US\$60 billion business opportunity for IT outsourcing in Canada (*CGI Annual Information Form*, 2004). Technology trends relevant to the industry include the growing IP telephony sector and web services.

2.7 Business Organization at XYZ

XYZ’s adopts a primarily functional organization with departments roughly corresponding to value chain activities (Figure 5). The company occupies two office

locations. The Technical Operations group and a portion of the Administration department occupy the satellite office. Co-ordination methods between departments and staff include Callisto, email, phone, and direct communication. XYZ's internal VOIP phone system provides seamless inter-office communication.

Figure 5: XYZ Organizational Structure.



Source: author.

2.7.1 Structure and Reporting

XYZ maintains a relatively flat hierarchy to encourage open communication. The company's corporate culture is strongly technically oriented and emphasizes knowledge and informal interaction. Response to direct customer demand drives much of the firm's activities; corporate culture reflects the customer driven nature of the company.

Proactivity, accountability, and participation in direct revenue-generating activities are recognized. The expectation of continuous learning coupled with frequent change creates a demanding environment. Under pressure, the organizational structure flattens further as

individuals seek direction from the senior management team. Senior management occasionally micro-manages critical issues.

The senior management team – consisting of the company President, VP Operations and VP Sales – form the strategic apex of the organization. Control is centralized. Senior management performs strategic planning for the organization, develops positioning strategy, and makes major resource allocation decisions. Senior management also steers global HR policy, sets compensation and benefits in accordance with the prevailing job market, and controls the hiring process. The VP Technical Operations and VP Sales conduct recruitment, selection, budgeting, and functional strategy development in their respective departments within the parameters identified by senior management; the company President assumes control of these functions across the remainder of the organization. Other departmental managers have relative autonomy with regard to process and workflow decisions, and meet periodically with senior management to review functional strategy.

The Technical Operations department is responsible for system assembly, wiring, installation, integration, and technical support activities. The organization of this department departs from the company's functional approach by using project-based teams. Priority high-revenue customer accounts are each assigned a technical team comprising lead, intermediate, and junior technical members. Teams have the opportunity to develop greater familiarity with customers' infrastructure thereby improving service quality. Technical Operations rarely maintains team composition across customer accounts to promote knowledge sharing, mentoring, and expertise with customer systems. Although this approach requires greater scheduling and coordination

effort, it provides the company with a flexible technical core able to adjust quickly to dynamic project commitments. Technical Operations has grown by approximately 25% over the last 12 months.

The Sales and Marketing department performs supplier-management and initial procurement duties in addition to CRM and promotion. The VP Sales and senior account manager coordinate department activities. Sales employees schedule customer projects in conjunction with IT Coordinators in the Technical Operations department while procurement staff remotely coordinate with receiving personnel in Administration. Additional roles in this department include traditional and Virtual CIO account managers. Sales & Marketing has grown in the last 12 months with the addition of two account managers.

The Finance & Administration department represents the company's support structure. Overall financial direction is established by the President and CFO. Administration functions occupy both office locations. Reception and dispatch take place at head office; shipping and receiving occur in the satellite location. Finance & Administration has grown significantly over the previous 12 months, expanding from two to five employees.

The Internal Operations department develops and maintains internal systems and conducts services R&D. Responsibilities include support and R&D for all hardware and systems used by the company. This compact department comprises a manager, systems architect, system administrator, and two part-time technical personnel consisting of a network engineer and software developer. Large installations or integration projects may draw upon resources from Technical Operations. Internal Operations presently does not

receive assistance from the Software Development department given the latter's commitment to ongoing customer projects. Internal Operations has not expanded in the last 12 months and has the highest aggregate workload in the company.

Software Development is the smallest department with only two full-time developers. Responsibilities include the production of websites and web applications for customer projects. Software Development is not involved in the production of saleable services or internal systems and operates with relative autonomy from the remainder of the organization. Department size increased from one to two developers following the acquisition of Perception Technologies.

2.7.2 Incentive Systems and Performance Measurement

Senior management performs the majority of HR activities, including monitoring department performance and reviewing incentives. Sales and Technical Operations departments have a measure of autonomy in this regard.

Technical Operations is the only department with a formal incentive system. Callisto's order management functionality directly tracks the duration and nature of work performed by an individual on a particular customer project. The department VP conducts formal periodic performance reviews based on labour billed to customer projects. Non-managerial technical employees receive an annual bonus reflecting their individual billings relative to the department.

XYZ has no formal incentive systems in the rest of the company. Sales & Marketing uses an informal reward system based on individual sales revenue with the

exact rewards structure personalized for each employee. All employees receive an annual bonus based on company performance.

Department managers conduct performance reviews quarterly and around project milestones as needed. Performance assessment involves qualitative review by the department manager and may consider quantitative measures if appropriate; for example, assessment of Sales & Marketing staff considers customer sales revenue.

2.8 Current Strategies at XYZ

2.8.1 Corporate Strategy

XYZ is rapidly establishing itself as a “one-stop” IT services company in the Vancouver region. The company’s growth-by-acquisition strategy and subsequent buyout of three local IT service firms has allowed XYZ to diversify into new service lines and target new customers. While the company continues to consider acquisition opportunities the primary strategic focus is on internal development. Core strategies are to increase working capital levels, maximize sales revenue from the new larger customer base, and develop internal capabilities to support growth.

XYZ’s foray into VOIP, traditional telephony, and CCTV services diversified the company’s services portfolio. In providing these new services, XYZ is able to leverage existing capabilities in network installation and integration thereby benefiting from economies of learning. The new offerings do not come at the expense of existing business: the company seeks to scale up existing services and further widen its focus to larger customers in the SME market. Increased market penetration from new and existing services will provide additional revenue opportunities through cross selling. The

company maintains its differentiation strategy with the value proposition of providing high-quality comprehensive IT services that deliver clear business ROI.

XYZ expects to develop its existing strategic alliances with Metrospan, Congruent, ViVoNET, and SOHO. The company does not expect to compete with these specialized firms preferring to continue offering discounted infrastructure management services in exchange for cross-selling opportunities.

To develop internally, XYZ's strategic initiatives include developing scalable infrastructure, improving the quality of services, and increasing operational efficiency. The company expects to achieve these objectives through business process re-engineering and focused development of internal IT systems.

2.8.2 IT Strategy

XYZ recognizes that IT strategy is instrumental in supporting corporate objectives. Immediate strategic IT objectives correspond to a 12-month timeframe and consist of:

- Streamlining internal IT infrastructure;
- Improving the functionality of internal systems to match business processes;
- Developing the ability of internal systems to realize revenue from the customer base; and,
- Reinforcing internal development capabilities.

Rapid growth and the recent acquisitions dramatically increased the size and complexity of IT infrastructure needed to support the company and its customers. The resulting maintenance requirements limit Internal Operations' ability to optimize systems and perform R&D. Senior management identifies streamlining internal infrastructure as a top priority.

Internal systems support business processes throughout the company and are the focus of ongoing development. However, the functionality of certain systems does not accurately reflect specific departmental processes. Another IT strategy is to address sub-optimal system functionality, and identify system integration opportunities.

XYZ's limited CRM capabilities constrain the company's ability to realize the full potential of their post-acquisition larger customer base. The company states a need for improved sales forecasting, analyzing new customer segmentation approaches, targeted marketing campaigns, and even business intelligence functionality. A strategic IT objective is the development of a CRM framework to support sales and marketing activities.

The company recognizes that strengthening internal software development capabilities is fundamental in enabling IT strategy. Another strategic IT objective is to ramp up labour resources and project management for internal software initiatives.

3 A CLOSER LOOK INSIDE IT AT XYZ

Developing IT strategy for XYZ requires a deeper understanding of the company's physical IT infrastructure, software systems, and governance. XYZ has identified several initiatives to achieve stated strategic IT objectives: an overview of these follows. An assessment of prevailing IT strategy and identification of critical issues facing internal-R&D further explore XYZ's IT environment.

3.1 Physical Infrastructure

XYZ's physical IT assets comprise workstations, servers, networking hardware, and supporting equipment in two physical office locations. XYZ's primary high-speed Internet connectivity is located at head-office.

XYZ operates a total of 31 servers. In terms of the services they support, these machines can be classified across three dimensions: internal vs. customer-related, primary vs. redundant, and current vs. legacy. Internal servers run systems for use by company staff while customer-related servers provide Managed Services. Redundant servers provide the same services as their primary counterparts but are required for mission-critical applications. Legacy servers are not used in daily operations but are required for historical data. All servers fill a specific role within the company with most servers dedicated to a single role to maximize performance and stability. Additionally, XYZ adds servers in response to internal or customer demand, often under significant

time pressure. Brisk customer demand and high R&D requirements leave few infrastructure optimization opportunities.

3.2 Software Systems

XYZ uses a wide range of software systems to support internal and customer activities. Fundamental systems include email, network management, data storage, and backup. Security systems include spam filtering, anti-virus, and firewall. Specialized systems enable the provision of Managed Services and support R&D activities. A discussion of systems relevant to achieving the stated strategic IT objectives follows.

3.2.1 Callisto

Callisto provides quoting, order-management, labour tracking, supplier tracking, purchasing, receiving, ERP, and limited CRM and asset tracking. The software performs invoicing and integrates with XYZ's accounting system. ERP capabilities are limited: the software does not offer the sophisticated functionality of established industry solutions such as SAP. CRM capabilities are also limited and not as exhaustive as the features of a commercial CRM tool.

Callisto's key advantages are threefold: integration between modules allows users to follow goods and processes through the company's value chain; the software supports serialized inventory; and the software's full capabilities are accessible over the Internet using only a web browser.

Veroso originally developed Callisto. The software, and Veroso's resulting process efficiency, was a significant motivating factor in XYZ's acquisition of the firm. Callisto is a complex custom application and the product of several thousand hours of

development effort. The system uses three dedicated servers for application serving, database, and dedicated R&D. Development is continuous and new functionality adds to the software's capabilities on an ongoing basis.

3.2.2 Bandwidth Monitoring System (BMS)

XYZ's Bandwidth Monitoring System (BMS) provides automated tracking of customers' data connectivity usage for billing purposes. BMS actually refers to a collection of open-source software, customized and integrated into a holistic system. BMS builds upon IPA, an open-source network accounting application. XYZ customized IPA extensively, adding management and reporting features, using it as the foundation for their system. Prior to BMS, tracking data connectivity involved repetitive, time-consuming, and error-prone manual labour. BMS enhances the effective provision of Managed Services and VOIP services. Internal Operations is presently adding remote management, advanced reporting, and improved integration to BMS.

3.2.3 Corporate VOIP

XYZ's Corporate VOIP system provides turnkey telephony for corporate environments. This system is an integrated solution, combining open-source technology with IP telephony hardware. Corporate VOIP incorporates Asterisk, an open-source private branch exchange (PBX) application. XYZ customized Asterisk, adding management and reporting features, and integrated the software with other open-source tools. Corporate VOIP further combines networking hardware and dedicated server resources. XYZ uses the system internally. Internal Operations is refining the system through the addition of remote management and advanced reporting. With growing

demand for VOIP solutions, improving the system's ease-of-use is a development priority for Internal Operations.

3.2.4 ISPMan

ISPMan is an open-source distributed application that manages the functions of an ISP through a central management interface (ISPMan Product Website, n.d.). ISPMan is instrumental in XYZ's ability to provide Managed Services. Internal Operations continues to expand ISPMan's capabilities with added management functionality and reporting.

3.3 Planning, Processes and Governance

XYZ's senior management team develops IT strategy in conjunction with overall corporate strategy. Senior management plans major infrastructure changes, develops and prioritizes initiatives, and as the R&D steering committee, monitors ongoing initiatives. Senior management rarely performs quantitative valuation for IT initiatives given the challenge in determining benefits for initiatives with strategic implications. XYZ justifies internal IT initiatives in an ad hoc fashion by qualitatively considering their expected contribution to efficiency, productivity, or saleable service revenue.

The company's customer focus is observable throughout R&D activities. Senior management often initiates projects for customer pilot initiatives or for maintaining the one-stop aspect of the business to preferred high-revenue clientele. Reactive by definition, these projects vary in complexity, are typically time-compressed, and usually fall outside the scope of ongoing initiatives.

XYZ's informal approach to IT governance extends to IT initiative deployment, post-launch monitoring, and training. Frequent and open communication throughout the company speeds adoption and rapidly notifies Internal Operations of problems or issues. The company President often directly manages Internal Operations by monitoring projects and steering development at the micro-level.

3.3.1 Budgeting

XYZ regards internal-R&D expenditure as an ongoing investment. The company's approach to internal IT budgeting involves allocation of annual and quarterly resources in exchange for a steady output of innovation and system improvements. The development budget is not exact and the company allocates funds as required.

3.3.2 Performance Measurement

XYZ does not use SLAs between business and Internal Operations, preferring a company-wide internal ticket system. Any employee may create a ticket for internal support or a system enhancement. Internal Operations reviews tickets daily. Callisto development has its own dedicated issue tracker also updated daily. In both systems, the ticket creator has the ability to re-open a ticket subject to inferior resolution quality. Both ticket systems track issue complexity, severity, and estimated-completion and actual-completion duration. Email remains the primary communication method for company-wide internal technical issues; ticket systems add accountability and quality to issue management.

With limited labour resources available to Internal Operations, senior management uses soft internal deadlines and simply directs development effort towards

projects deemed high priority. Long lead times for internal-R&D deliverables are common especially for software initiatives. Internal Operations' frequent extended working hours reflect the high number of ongoing projects within the department.

At the individual level, Internal Operations uses few technical performance metrics. R&D activities vary considerably, ranging from software debugging to server maintenance. Developing performance metrics across the full range of distinct technical roles in the department is impractical. Additionally, the high incidence of unexpected events introduces significant variance into potential metrics. Hardware failure, vendor software incompatibility, and security flaws in commercial software all affect productivity and are impossible to predict. As a result, Internal Operations uses a chiefly qualitative but thorough approach to performance measurement. Each week, the department collectively identifies key projects and priorities, and establishes individual goals. At the end of the week, performance is assessed based upon goal completion, voluntary improvements to systems, infrastructure, or environment (through the addition of more efficient tools or technical processes), and support issue resolution time and quality. Performance measurement also considers efficiency and morale, the latter essential given the department's high output. Internal Operations management examines several quantitative measures such as ticket resolution times, and the frequency and severity of re-opened tickets. To maintain objectivity the department manager and employees converge on individual assessments. The department manager frequently conducts performance reviews at regular intervals and around key project milestones. Reviews incorporate self-assessment, peer review, and 360-degree feedback. Senior

management and the Internal Operations manager periodically review the performance measurement process itself.

3.4 Key IT Initiatives

XYZ has identified a number of IT initiatives to achieve immediate strategic IT objectives. Where possible, these initiatives seek to leverage core competencies, namely Callisto and integration proficiency.

3.4.1 Reduce Server Count through Service Consolidation

To streamline internal IT infrastructure, XYZ proposes to reduce the number of servers through service consolidation. Fewer servers relieve Internal Operations from maintenance duties. This initiative first requires identification of candidate servers based on their role. Legacy servers are the priority followed by servers running non-critical services. For each server, Internal Operations will confirm usage and schedule consolidation in accordance with allowable downtime. Following any necessary backup of data, Internal Operations will perform consolidation and testing, the latter in conjunction with key users. Internal Operations has identified six servers for consolidation and estimates that up to another seven may be candidates pending evaluation – possibly reducing the number of servers by half.

3.4.2 Reinforce Internal Software Development Capabilities

With growing demands on Internal Operations and the majority of IT initiatives software-based, XYZ acknowledges the need to increase internal-R&D software capabilities. The company recognizes that saleable custom software development provides limited revenue. This initiative involves the allocation of a portion of Software

Development labour resources to Internal Operations exclusively for Callisto development. As part of this initiative, Software Development's formal project management process will oversee Callisto development.

3.4.3 Develop Prepaid-Labour Functionality in Callisto

XYZ structures customer SLAs with a running balance of prepaid labour. In line with the strategic IT objective of addressing sub-optimal system functionality, this initiative involves the adding of prepaid labour tracking, reporting, and invoicing to Callisto. This initiative is instrumental in realizing efficient tracking of SLAs for larger customers.

3.4.4 Develop Recurring-Billing Functionality in Callisto

Further in line with improving system functionality, this initiative adds automated order generation, or "recurring billing", functionality to Callisto. Recurring billing involves automated periodic generation of orders and invoices for repeating services. Managed Services use recurring billing extensively. Efficiently increasing Managed Services capacity is dependent upon this initiative.

3.4.5 Develop Callisto Purchasing Integration

XYZ's major distributors offer direct connection to their inventory databases via web services. This initiative seeks to integrate Callisto's purchasing module with these web services.

3.4.6 Develop Callisto/BMS Integration

While BMS tracks data connectivity usage, Callisto is still required for order generation and invoicing. This initiative proposes to integrate BMS with Callisto to alleviate manual order generation. This initiative complements the addition of recurring billing to Callisto.

3.4.7 Develop CRM Capabilities

IT strategy identifies the development of XYZ's CRM capabilities as an objective. Through coordination between Sales and Internal Operations, this initiative examines Callisto's potential as a CRM platform. Sales will review Callisto's existing capabilities and identify desired functionality. Subject to suitability of the underlying software, this initiative will add CRM functionality to the Callisto project management cycle.

3.5 Is IT Meeting XYZ's Needs?

As seen, internal-R&D plays a critical role in supporting XYZ's activities and maintaining competitive advantage. The ability of internal-R&D to meet the needs of the company depends on the alignment between IT strategy and business strategy. Research shows that business-IT alignment improves firm performance and is important in realizing optimal performance from IT investments (Chan, Huff, Barclay, & Copland, 1997). An assessment of internal-R&D performance examines business-IT alignment across a number of organizational dimensions (Luftman, 2003).

3.5.1 Assessment of XYZ's Business-IT Alignment

Many approaches to assessing business-IT alignment exist (Chan et. al, 1997; Luftman, 2003; Henderson & Venkatraman, 1999). Luftman (2003) provides a framework to assess an organization's business-IT alignment maturity while capturing the dynamism of business and technology environments. The framework seeks to provide organizations with an understanding of their existing alignment, in what areas it can improve, and what specific actions are necessary to improve it. The framework considers 38 distinct alignment practices grouped into six broad criteria: communications, competency/value measurements, governance, partnership, technology scope, and skills (Luftman, 2003).

Communications criteria reflect the efficacy of knowledge sharing, and the understanding and awareness of the role of IT and business throughout the organization. The competency/value measurement criteria assess the ability of IT to demonstrate value to the business in terms understandable by the business. Governance reflects the extent to which business and IT functions share risk, conflict resolution, resource allocation, prioritization, and responsibility for IT. Partnership considers the nature of the relationship between business and IT – particularly the role of IT as an enabler and driver of business processes and strategy. Technology scope assesses the firm's ability to effectively utilize emerging technologies and provide a flexible infrastructure to support the business. Finally, skills criteria measure human resource, cultural, and social factors (Luftman, 2003).

Each of 38 practices receives a score indicating the level of alignment from one through five. While each practice has unique qualitative considerations, the following levels broadly describe alignment:

- Level 1: Without process (no alignment)
- Level 2: Beginning process
- Level 3: Established process
- Level 4: Improved process
- Level 5: Optimal process (complete alignment)

Using this framework, the analysis characterizes XYZ's alignment between internal IT and the remainder of the organization (Table 2). A discussion of each alignment criteria follows the tabular summary of alignment practices.

Table 2: Current Business/IT-Development Alignment Criteria.

Criteria	Score	Characterization
Alignment practice		
Communication		
Understanding of business by IT	4	Understanding encouraged among IT staff
Understanding of IT by business	4	Understanding encouraged among staff
Organizational learning	4	Formal methods sponsored by senior management
Style and ease of access	5	Two-way, informal and flexible
Leverage intellectual assets	3	Structured around key processes
IT-business liaison staff	3	Facilitate knowledge transfer
Competency/Value Measurements		
IT metrics	4	Also measure effectiveness
Business metrics	4	Also measure customer value
Link between IT and business metrics	3	Business, IT metrics becoming linked
Service level agreements	4	Enterprisewide
Benchmarking	4	Routinely benchmark; usually act
Formally assess IT investments	2	Only when there is a problem
Continuous improvement practices	2	Few; effectiveness not measured
Governance		
Formal business strategy planning	4	At unit and enterprise, with IT
Formal IT strategy planning	3	Some business input and cross-functional planning
Organizational structure	2	Centralized; some co-allocation
Reporting relationships	3	CIO reports to COO
How IT is budgeted	4	IT treated as investment
Rationale for IT spending	5	Competitive advantage, profit
Senior-level IT steering committee	2	Meet informally as needed
How projects are prioritized	1	React to business or IT need
Partnership		
Business perception of IT	5	Partner with business in creating value
IT's role in strategic business planning	4	Enables or drives business strategy
Shared risks and rewards	1	IT takes all the risks, receives no rewards
Managing the IT-business relationship	2	Managed on an ad hoc basis
Relationship/trust style	5	IT services
Business sponsors/champions	1	Usually none
Technology Scope		
Primary systems	5	Partner with business in creating value
Standards	2	Enables business process
Architectural integration	1	IT takes all the risks, receives no rewards
How IT infrastructure is perceived	5	Processes are continuously improved
Skills		
Innovative, entrepreneurial environment	4	Also at the corporate level
Key IT HR decisions made by	4	Top business and IT management across firm
Change readiness	2	Change readiness programs emerging
Career crossover opportunities	1	Job transfers rarely occur
Cross-functional training and job rotation	2	Decided by units
Social interaction	3	Trust and confidence is starting
Attract and retain top talent	2	IT hiring focused on technical skills

Source: author, from data gathered through observation of company XYZ Solutions Inc., November 2005.

3.5.1.1 Communications

Alignment benefits from Internal Operations' understanding of the company's business, gained from services-R&D. Conversely, a high awareness of Internal Operations' efforts across the organization aids adoption of new systems and functionality. Alignment further benefits from XYZ's informal communication style. The company's flat hierarchy enhances the speed and efficiency of R&D and support interaction.

An absence of formal knowledge sharing systems and dedicated IT-business liaison staff is not a significant impediment to alignment given the company's small size and communication flexibility. Technical employees throughout the company benefit from formally sponsored certification programs and attendance at technical conferences.

3.5.1.2 Competency/Value Measurements

XYZ's lack of formal valuation for initiatives is a critical source of misalignment, especially given the importance of IT initiatives in the company's IT strategy. Without any frameworks to assess initiatives, XYZ risks focusing on projects with lower business benefit.

Continuous learning for Internal Operations staff is mandatory given their innovative and technical role. An absence of any processes to measure continuous learning effectiveness does not significantly detract from business-IT alignment.

3.5.1.3 Governance

Business-IT alignment is adequate for development planning, reporting, and overall budgeting. Senior management develops strategy and determines budgeting at the

corporate and IT levels concomitantly. Unexpected technical hurdles have the ability to derail IT initiatives at short notice; informal meetings allow the steering committee to respond quickly. The company's centralized organizational structure uses informal relationships and works efficiently for a small company (Sambamurthy, 2000).

Reactive project prioritization is a key source of misalignment as senior management may not prioritize IT initiatives optimally. Additionally, they may have only limited awareness of the consequences associated with prioritizing urgent customer-related projects.

3.5.1.4 Partnership

XYZ's alignment in this area reflects IT's function as an enabler and driver of competitive advantage within the company. With senior management comprising the steering committee, informal management of the business-IT relationship does not detract from IT strategy.

The lack of shared rewards between business and IT is a major source of misalignment. Internal Operations may risk unreasonably high workloads from urgent new projects, but receives no rewards from timely or quality completion. Business functions risk lost productivity from delayed or lower quality internal-R&D, but may realize rewards from productivity increases due to new system functionality and innovation. Internal R&D activities are particularly effort intensive and frequently result in sunk developer time. Unequal sharing of development risks and rewards places pressure on business-IT alignment.

The absence of business champions for IT initiatives further inhibits alignment. Without adequate business accountability and support for IT initiatives, XYZ risks realizing reduced benefits. Loss of business value may result from any point in the initiative life cycle: a weak business case, insufficient preparatory business process change, technical divergence, or inadequate post-deployment preparation (Tiernan & Peppard, 2004).

3.5.1.5 Technology Scope

Strategic IT initiatives to develop CRM functionality and supplier integration build business-IT alignment by increasing IT's role the value chain and by creating new value opportunities for the company.

XYZ's rapid growth has affected tremendous change upon the systems and tools used by Internal Operations. Standards and processes exist but play a limited role partly due to project urgency and partly because rapid company and industry change renders many processes obsolete. Standards and processes are likely to remain in flux from the continuing innovative focus of IT strategy. Innovation requires flexibility – XYZ's alignment receives adequate support from internal-R&D standards that play an enabling role but do not constrain development.

Architectural integration shares a similar reward imbalance to system development. Internal Operations risks high workloads and receives no rewards from improvements to infrastructure. Business functions risk loss of productivity from system downtime but may receive rewards from productivity gains due to infrastructure streamlining.

Alignment benefits form the company's continuous improvement of IT infrastructure. Internal Operations maintains business-IT alignment by constantly upgrading and updating infrastructure hardware and software.

3.5.1.6 Skills

XYZ's longer-term strategic IT objectives – such as developing CRM capabilities – involve high complexity risk but have the potential to deliver significant business value. These initiatives suggest a good fit with senior management's entrepreneurial vision. Historical delivery of clear business value has developed an emerging confidence and trust in internal-R&D throughout the company. XYZ seeks to harness this confidence and the company's culture of change readiness to push adoption of new system functionality.

The scarcity of job transfers is a function of the company's small size and does not yet detract from business-IT alignment. Highly focused and mission-critical internal-R&D roles leave few opportunities for cross-functional training and job rotation. Talent selection for Internal Operations considers technical skill only.

3.5.2 Organizational Factors Affecting IT

The assessment of XYZ's business-IT alignment highlighted the potential issue of unbalanced rewards. As mentioned, Internal Operations realizes no rewards from successful internal-R&D efforts. The company's internal systems are public goods as all staff can simultaneously use them and no single employee can practically exclude others from using these systems. In short, internal systems are non-rivalrous and non-excludable. As public goods, internal systems face undersupply in the absence of

adequate monitoring and rewards systems (Vining, 2003). Additionally, the absence of any employee insurance against risky internal R&D creates a motivational barrier for these activities. With no performance measurement or incentive systems for Internal Operations, undersupply of internal systems R&D is a potential and critical concern given the importance of these systems in maintaining XYZ's competitive advantage.

Another internal systems issue is "frills development". Frills development is the creation of functionality that is non-essential, outside project scope, and delivers minimal business ROI. Examples include features that provide productivity enhancements to only a single user or that provide little practical value such as cosmetic changes. Frills development is frequently time-consuming and may result in conflicts with existing functionality. This type of development occurs when non-R&D staff overstate the benefits of a desired feature (or over-emphasize the extent to which a missing feature impairs productivity) to spur development. This overstatement of marginal valuation is characteristic of public goods (Vining, 2003). Frills development typically occurs for internal systems that lack structured project management and have a history of customization. Callisto, in particular, experiences frequent frills development.

3.5.3 Assessment of XYZ's IT Strategy

From an internal perspective, XYZ's IT strategy improves the company's competitive position by providing strategic opportunities and cost reduction. With overlap between internal and service-R&D, IT strategy also contributes to revenue enhancement. XYZ seeks to develop benefits and competitive barriers through the capabilities of internal systems. R&D innovations intersperse ongoing incremental IT development. While the company is not in a position to affect industry standards, certain

initiatives have a vertical focus. Internal systems support the company's value chain and underpin several competitive advantages. Moreover, most internal systems are fully or partially customized making competitor emulation difficult. The second level of Rapp's Strategic Levels of IT Use succinctly characterizes XYZ's IT strategy (Rapp 2002, p. 24). XYZ even demonstrates attributes of the most evolved third level in the form of complete integration between IT with overall business strategy, operations, and organization.

The critical success factor for internal-R&D is alignment between business and IT strategy. Superior alignment improves internal-R&D performance, which in turn improves overall company performance. Alignment achieves congruency between business and IT objectives, and ensures that internal-R&D has the communications, governance, capital, and skills to succeed.

XYZ shows moderate to high business-IT alignment. One of the company's alignment strengths is in goals and overall vision. IT strategy focuses on adding new functionality and building new systems – a good fit with the company's entrepreneurial environment and rapid-growth goal. Strategic IT initiatives also reflect the importance of IT as a value creator by seeking to provide new opportunities for value realization. By combining formal and informal strategic IT planning XYZ achieves congruency between IT objectives and corporate strategy while maintaining adaptability. A flexible approach to budgeting allows the company to meet development contingencies.

As expected for a small IT service company, overall awareness of IT is high within the organization. Prevalent use of IT systems and a technical corporate culture enhance alignment. XYZ benefits from company-wide trust of IT infrastructure and

internal-R&D efforts. While frequent change creates a modicum of friction, a change readiness culture speeds the adoption of new systems and functionality.

IT strategy and corporate strategy diverge in a number of critical areas. XYZ falls short in its informal approach to evaluating IT initiatives. Without thorough evaluation capabilities senior management may fail to prioritize initiatives that deliver the highest business benefits. Another alignment issue is the imbalance in reward sharing between business and R&D functions. This imbalance suggests that incentive issues may be affecting Internal Operations' ability to deliver internal systems development. Alignment also suffers from a lack of business accountability for IT initiatives. With no business champions to support IT initiatives, XYZ risks unrealized benefits from these projects.

In summary, examining XYZ's business-IT strategic alignment provides insights into the company's ability to deliver and realize value from internal IT. The company's strategic IT initiatives are innovative and well aligned with overall strategic objectives. Internal-R&D delivers at a sufficient rate and quality level to provide business functions with value while instilling confidence throughout the company. However, various factors impinge upon XYZ's ability to realize optimal value from IT. These factors are a reactive approach to prioritization, imprecise valuation of IT initiatives, and a potential undersupply of internal system development due to an absence of balanced rewards.

3.6 How IT Strategy Will Impact XYZ

Understanding the implications of XYZ's IT strategy requires an assessment of the company's ability to realize IT value. Using the 12-month timeframe of XYZ's IT strategy, this assessment considers changes to business-IT alignment against anticipated

changes to the company and industry. The assessment assumes that the company's overall strategy and IT strategy remain constant: XYZ will maintain its rapid growth strategy and will continue to emphasize the improvement of infrastructure, service quality, and operational efficiency.

At 12 months, Callisto will provide closer functionality to business processes, infrastructure support requirements will be more manageable through consolidation, and the company may be ready to take advantage of CRM capabilities. Internal Operations will possess greater software development capacity through the addition of labour resources from Software Development. Additionally, Software Development's formal project management processes will oversee Callisto development. Within the 12-month timeframe XYZ's market penetration will increase as the company continues to target larger customers in the SME segment. Support needs, infrastructure requirements, and the frequency of reactive customer projects will increase in proportion to the company's growing customer base.

Industry changes in this period include further differentiation of IT services, market entrants from horizontally diverging companies, and possible competition from first-tier IT service firms entering the SME market. Technologies such as VOIP and web services will see greater corporate use, competitors will develop their internal IT capabilities, and the industry will see an increase in demand for IT services. Greater industry demand will translate into higher overall R&D needs within the company but will have little direct effect on the various dimensions of business-IT alignment.

Again drawing upon Luftman's framework (2003), this analysis assesses XYZ's business-IT alignment at 12 months given the impact of prevailing IT strategy. Only

changes to select competency/value-measurement, governance, and partnership alignment criteria are expected hence the partial listing of alignment practices (Table 3).

Table 3: Expected Business/IT Development Alignment Criteria.

Criteria		
Alignment practice	Score	Characterization
Competency/Value Measurements		
IT metrics	4	Also measure effectiveness
Business metrics	4	Also measure customer value
Link between IT and business metrics	3.5 (+0.5)	Formally linked; reviewed and acted upon
Service level agreements	4	Enterprisewide
Benchmarking	4	Routinely benchmark; usually act
Formally assess IT investments	2	Only when there is a problem
Continuous improvement practices	2	Few; effectiveness not measured
Governance		
Formal business strategy planning	4	At unit and enterprise, with IT
Formal IT strategy planning	3	Some business input and cross-functional planning
Organizational structure	2	Centralized; some co-allocation
Reporting relationships	3	CIO reports to COO
How IT is budgeted	4	IT treated as investment
Rationale for IT spending	5	Competitive advantage, profit
Senior-level IT steering committee	2	Meet informally as needed
How projects are prioritized	1.5 (+0.5)	Determined by IT function
Partnership		
Business perception of IT	5	Partner with business in creating value
IT's role in strategic business planning	4	Enables or drives business strategy
Shared risks and rewards	1	IT takes all the risks, receives no rewards
Managing the IT-business relationship	3.5 (+1.5)	Processes exist and complied with
Relationship/trust style	5	IT services
Business sponsors/champions	1	Usually none

Source: author, from data gathered through observation of company XYZ Solutions Inc., November 2005.

Use of the Software Development department's formal project management structure for Callisto will improve alignment across a number of dimensions. Callisto development will benefit from focused project budgeting, tracked developer time and productivity, and frequent review of development metrics by the steering committee and Software Development manager. Callisto initiatives will also benefit from more efficient prioritization: reduced frills functionality and fewer reactive customer projects will

streamline development. Partial increases across several dimensions reflect the fact that not all internal software development will fall under the auspices of Software Development's project management structure.

Internal-R&D will likely show higher performance due to Callisto process changes, but will face greater overall demand as the company grows. Innovation and value creation will continue driving internal-R&D. Performance will still benefit from communication strengths and planning flexibility. Change readiness and company-wide familiarity with IT will continue assisting adoption. On the other hand, misalignment sources will continue detracting from internal-R&D performance and the potential undersupply of internal systems development due to inadequate incentives will remain. The inability to evaluate initiatives thoroughly will continue to foster improper project prioritization. Sub-optimal realization of IT initiative's business value due to inadequate business accountability will also persist.

Adding resources and process to Callisto development addresses the shortage of internal-R&D labour and provides Callisto-based initiatives a measure of insularity from some sources of misalignment. However, the majority of critical alignment inhibitors remain unaddressed and the net outcome of IT strategy is that XYZ's development ability will continue un-optimized. The call to action is that failure to maximize the company's ability to deliver and realize value from internal-R&D combined with increasing industry competition will diminish the company's competitive advantage. XYZ's IT strategy must place greater focus on developing the capability to develop and utilize internal systems.

4 INSIGHTS FROM MANAGEMENT RESEARCH

Several major sources of business-IT misalignment impede XYZ's development performance. These sources are unbalanced intra-firm development rewards, the inability to evaluate IT initiatives, and insufficient business accountability for these initiatives. By examining the management literature, this analysis seeks to identify approaches that XYZ can use in moving forward in optimizing their IT strategy.

4.1 Sources of Firm Inefficiency

In the context of an IT organization heavily dependent upon internal IT systems, several forms of firm inefficiency stand out: the undersupply of public goods; the undersupply of internal goods with low visibility; and the scarcity of risky but potentially valuable intrapreneurial activities, such as R&D. Using the theory of market failure, Vining (2003) develops a framework for understanding and addressing sources of firm inefficiency. These market failures typically occur in rapidly growing firms (Vining, 2003). Vertical diversification may prompt in-house production of previously outsourced goods; additionally and consequently, internal incentive systems may not have evolved alongside internal goods production.

Public goods are characterized by their non-rivalry, whereby their benefits can be simultaneously realized by all users, and by their non-excludability, whereby maintaining exclusive control over their use is not practical (Vining, 2003). Company-wide IT systems – such as hardware infrastructure or software applications – and the development

efforts to maintain and improve these systems are examples of public goods. Firm inefficiency arises from the undersupply of public goods due to the free-rider problem: individuals not responsible for public goods production may tend to overstate their valuation of the goods in an effort to expedite supply; conversely, individuals responsible for production may tend to understate their valuation in order to minimize their contribution. Determining the optimum level of public goods is therefore challenging and in the absence of corrective mechanisms such goods remain undersupplied (Vining, 2003; Kandel & Lazear, 1992). Undersupply is typically severe for goods with small individual-level benefits (Vining, 2003). Many public IT goods provide substantial benefits to the firm but deliver only moderate individual benefits. Examples include customer-accessible product databases and intranet security.

Firm inefficiency also arises in the undersupply of non-observable internal goods for which internal positive externalities exist. Some internal IT goods – such as infrastructure maintenance and upgrades – have low visibility, deliver company-wide benefits, and are the efforts of an individual or small group within the firm. The problem arises when employees involved in production are also delivering high-visibility goods with greater likelihood of rewards. With rewards associated with the supply of observable goods, employees will tend to undersupply the non-observable counterparts (Vining, 2003; Kerr, 1975).

The third identified source of firm inefficiency is the difficulty in convincing employees to engage in potentially valuable but risky intrapreneurial activities (Vining, 2003). Employees will be hesitant to invest time and effort into such activities without sufficient insurance in the form of failure tolerance or explicit rewards (Vining, 2003).

Addressing intrapreneurial risk is especially important in environments characterized by rapid technological and customer change (Vining, 2003). IT R&D activities frequently involve dynamic technical requirements and substantial sunk time investments.

Vining (2003) suggests four approaches for addressing the identified sources of inefficiency. Internal subsidies seek to alter employee incentives by changing the relative internal prices of firm goods. Such subsidies can reduce the employee cost of producing public goods and increase the reward associated with producing non-observable goods. Internal rules, varying from regulations and frameworks to “implicit” corporate culture codes also seek to adjust the price, quality, or quantity of internal goods production. Service level agreements are an example of a rules-based approach. Internal insurance to encourage risk-taking activities may take the form of a forgiving corporate culture or job security. Approaches such as not penalizing employees for initial failures attempt to mitigate the challenge in assessing the *ex ante* validity of such activities (Vining, 2003). However, the firm’s compensability limit must factor into any insurance system. Outsourcing supply is another method for addressing internal inefficiency albeit with a possible loss of control.

4.2 Incentives, Rewards, and Recognition

The topic of incentives receives substantial theoretical and applied consideration in the management literature. A fundamental debate regarding incentives continues: economists argue that individuals respond to rewards or extrinsic motivation, while sociologists assert that individuals are motivated intrinsically or through reinforcement (Bénabou & Tirole, 2003). Both views can be shown to be rational (Bénabou & Tirole, 2003) which does not simplify the structuring of incentive programs in the workplace.

Incentive structures often have a monetary bias, through the intuitive opinion that money is a universal source of compensation and motivation. Incentive structures may combine short- and long-term, monetary and non-financial components (Brelade & Harman, 2003). Non-financial incentives include career opportunities or training. Social recognition is also an effective non-financial incentive in motivating employees and increasing productivity (Giles, 2004). Reinforcement theory suggests that supporting and emphasizing performance enhancing actions is more effective than simply rewarding the outcome of such behaviour (Luthans & Stajkovic, 1999). Reinforcement may be in monetary form, or be provided as feedback or visible social recognition.

Luthans and Stajkovic (1999) offer a framework for assessing the effectiveness of reinforcement. The framework involves characterizing behaviours that precede performance generating activities, and examining the effect of various types of reinforcement upon performance (Luthans & Stajkovic, 1999). The framework also considers the availability of hard and soft performance metrics in the context of the workplace environment. A study based on the framework indicates that feedback and social reinforcement provide greater performance improvements than monetary reinforcement alone, and virtually the same improvement as providing all three types (Luthans & Stajkovic, 1999). The authors conclude that it is not cost-effective for HR managers to devote financial resources and effort towards simultaneously applying monetary, performance feedback, and social reinforcement, when non-financial approaches produce the same results (Luthans & Stajkovic, 1999).

Regardless of the exact approach used in incentive systems, the prevailing view is that reinforcement is more effective than simple rewards, recognition is highly effective,

and exclusively monetary approaches are only somewhat effective. Additionally, incentive systems require monitoring, feedback, and adjustment in order to maximize employee performance.

4.3 Estimating the Business Benefits of IT

Evaluating IT benefits is an important aspect of business-IT alignment. Valuation enables an understanding of business ROI for individual projects and a means of prioritizing between projects. Even if performed implicitly, valuation is frequently a prerequisite for project initiation. Used in conjunction with performance measurement frameworks, valuation techniques may assess ongoing congruence between project deliverables and business objectives.

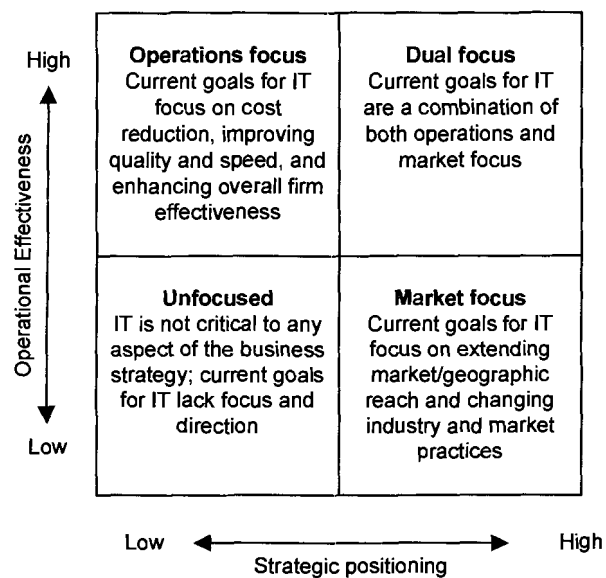
Many methods for determining IT benefits exist. Common qualitative methods include analysis by internal rate-of-return (IRR), net present value (NPV), and discounted cash flow (DCF). These methods are useful for estimating benefits that are “monetized” but are not well suited for applications where the benefits are intangible (McKeen & Smith, 2003). IT investments, in particular, are frequently strategic in nature. Assessing these projects may be difficult as benefits realization occurs over a long time and possibly in conjunction with organizational changes such as business process reengineering (Devaraj & Kohli, 2000). The uncertainty of complex IT projects, due to their highly conceptual nature, adds to the difficulty in estimating benefits. Even valuation techniques such as real options analysis consider uncertainty in a quantitative context.

Fortunately, a range of qualitative valuation methods exists in the management literature. Qualitative methods are no less formal but require use by both business and IT

managers to be effective. The latter may tend to consider only technical development and support costs against the IT budget (McKeen & Smith, 2003). A selection of qualitative valuation or “benefit estimation” techniques follows. Given the strategic nature of XYZ’s IT investments and the corresponding difficulty in determining business benefits, the focus here is on methods that are intuitive and rely upon available data.

The role of IT within the company provides a backdrop for evaluating project benefits. IT project motivation is typically well defined: the project may be intended to expand the firm’s product or service portfolio, enhance the work environment, or save costs in the value chain. IT’s role in the organization can be characterized according to operational effectiveness and strategic positioning (Tallon, Kraemer, & Gurbaxani, 2000). A level of “fit” between an IT initiative and IT strategy can then be assessed (Figure 6).

Figure 6: IT-Goal Focus Benefit Estimation Method.

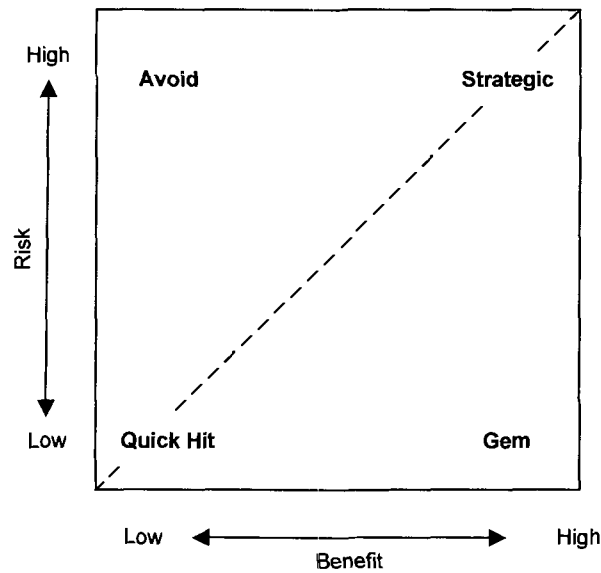


Source: author, after Corporate Goals for IT, Tallon et al., 2000.

Another benefit estimating technique examines project value against the company's critical success factors (CSFs). This approach comprises three steps: ranking the project against each CSF, qualitatively describing the impact of the project on all CSFs, and identifying the key performance indicator (KPI) for each CSF (McKeen & Smith, 2003). The first step forces users to apply a prioritization approach to the valuation that is useful when comparing projects. The next step generates a broader view of the project's implications and may identify otherwise overlooked issues. The final step identifies indicators of success that may provide a basis for performance monitoring. A variation of this technique is the examination of the relationship between a project and components of the value chain (McKeen & Smith, 2003). This approach provides more of an operational focus.

Risk plays a significant role in any substantial IT project. Changes to project scope, variation in vendor service level, or business model changes all pose risk. Risk assessment must also consider uncertainty associated with use of the technology. Simply minimizing risk is undesirable as the organization may fail to take advantage of potentially risky strategic projects with significant reward potential. An approach to estimating business benefits through risk assessment involves measuring risk, discounting IT benefits based on risk, and understanding the risk comfort zone of the organization (McKeen & Smith, 2003). Measuring risk first requires identification of key risk factors (areas in which the project is most likely to fail) in both a technical and business perspective. Identification includes determining the frequency and severity of key risks. The next step involves discounting benefits by these characterized risks (Figure 7).

Figure 7: Risk Discounting Benefit Estimation Method.



Source: author, based on Strategies for Estimating IT Benefits, McKeen & Smith, 2003.

Projects that deliver greater rewards generally involve greater risk. However, “off diagonal” projects require special attention: high-risk low-return projects require avoidance; low-risk high-return projects represent “low-hanging fruit” (McKeen & Smith, 2003). An organization’s risk aversion is a function of financial considerations, organizational factors, and corporate culture. Understanding the nature of the company’s risk comfort zone develops a more complete understanding of the risk-reward tradeoff for a given project.

The benefit estimation methods discussed provide a number of qualitative approaches for evaluating IT initiatives. However, no single method is superior. A robust evaluation approach combines several methods. Benefit estimation techniques provide further value through rigorous integration into existing IT planning.

4.4 Achieving Accountability with Business Champions

Management and IT literature highlight the importance of business champions in achieving superior project success and value (Overby, 2005; Reimus, 1997). Adams (2003) and Luftman (2003) also discuss the role of business champions in achieving business-IT alignment. Some firms go so far as to veto projects that do not have a business champion (Ross, Beath, & Goodhue, 1996). Two key attributes appear to characterize the business champion's involvement in IT initiatives: ownership and accountability. The business champion takes ownership of the IT initiative by gaining business support for the initiative, convincing business of IT's capabilities to deliver, and building trust and mutual respect between IT and business functions. In essence, they provide sponsorship for the initiative (Reimus, 1997). The business champion also takes accountability for achieving the financial and strategic goals of the initiative (Reimus, 1997).

Two factors drive the need for business championship. First, the business benefits of IT initiatives only accrue when business units successfully use IT systems to create value. In other words, value is not realized when the technology or services are created but only when they are used (Overby, 2005). This usage requires change and innovation on the part of the business unit (Tiernan & Peppard, 2004). Second, the IT function has little control over business units' use of the technology or services. Therefore IT cannot be held accountable for what it has no control over (Tiernan & Peppard, 2004). These observations suggest the need for accountability of the business transformation process, use of technology, and ultimate realization of value. Technology managers are not

specialized for this role – business managers are (Reimus, 1997; Tiernan & Peppard, 2004).

The business champion need not fill the role of CIO. Understanding the business and its problems, establishing IT organizational learning, and developing the IT portfolio still demands executive involvement (Reimus, 1997). However, the business champion's accountability lies in delivering the results of the initiative itself rather than the infrastructure that enables the results (Reimus, 1997).

Documentation enhances the effectiveness of business championship (Reimus, 1997). Selecting the business champion in the business case, identifying how results will be achieved, and determining how success will be measured all create a foundation for the business-IT relationship and improve business-IT management transparency.

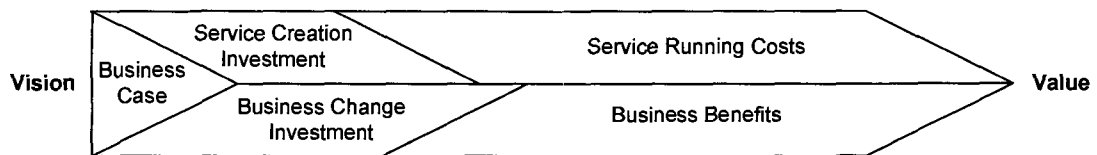
Tiernan & Peppard (2004) introduce the concept of the vision-to-value (V2V) vector to further examine the relationship between business accountability and IT initiatives. A V2V vector is a collection of investments and costs in both business and IT with the congruent objective of delivering a net positive business benefit to the organization (Figure 8). V2V vectors comprise the following components:

- An initial *business case* outlines the vision of the initiative and identifies the ultimate value to be derived by the organization.
- A subsequent *business change investment* enables the transformation the business must undergo in order to realize the benefits of the IT system to be delivered. Examples include changing business processes, updating work

procedures, and training employees. The business change investment may extend past deployment of the service particularly in the case of training.

- Also following the business case, a *service creation investment* enables the technical development of the system itself.
- Once the technology is deployed *service running costs* arise corresponding to the on-going expenditure required to run and maintain the system. Examples include hardware and software upgrades, support labour, and provision of backup and security activities.
- *Business benefits* complete the vector. These are the increases in revenue, productivity, or cost savings subject to use of the system.

Figure 8: Vision-to-Value Vector.

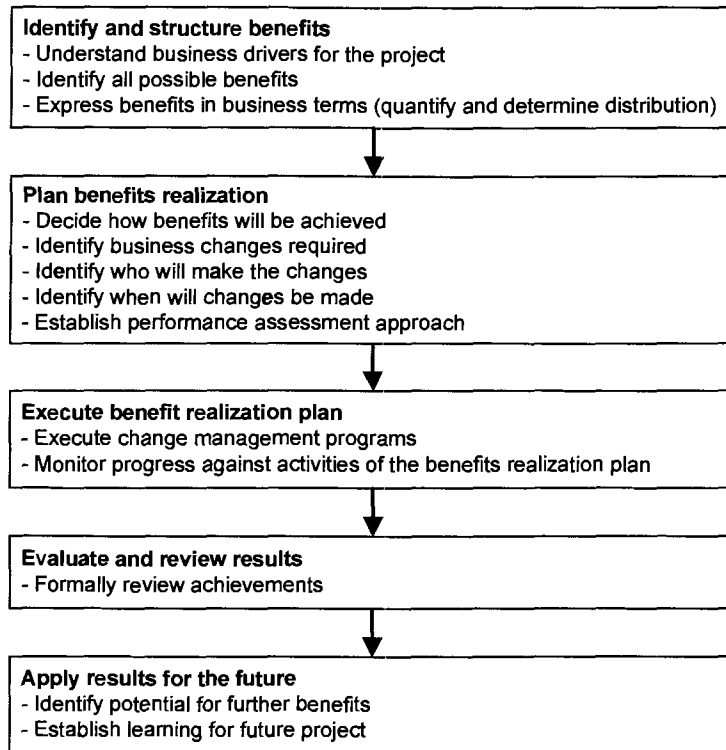


Source: author, adapted from Vision-to-Value Vector: Timing of Cash Flows, Tiernan & Peppard, 2004.

The model provides a greater understanding of the components of an IT initiative. The model further highlights the responsibilities required to understand and manage the vector in its entirety. This role calls for business and technical knowledge, access to business and IT functions, sufficient decision-making authority, and budget influence. The business champion essentially takes ownership of the vision-to-value vector and is accountable for delivering its value.

Tiernan & Peppard (2004) identify an IT benefits management process comprising a number of stages applicable to management of the V2V vector (Figure 9). Although these stages do not match the vector components exactly (a business champion cannot be expected to manage the actual technical development of the IT service) they enable successive realization of business value through the life cycle of the vector (Tiernan & Peppard, 2004).

Figure 9: Benefits Management Process.



Source: author, based on Tiernan & Peppard, 2004.

The benefit management process highlights the importance in understanding how the firm will realize benefits. A key aspect of the framework is the inclusion of performance monitoring. Measuring the progress of business changes and realized benefits is as important as measuring the progress of technical development (Tiernan &

Peppard, 2004). Monitoring allows an objective assessment of the initiative's achievement and enables organizational learning by providing a baseline with which to compare future initiatives.

The vision-to-value vector and benefits management process together provide a practical approach in designing the role of business champion.

5 STRATEGIC OPPORTUNITIES FOR IT AT XYZ

XYZ's competitive advantage is dependent upon the company's ability to develop and deliver internal systems. Although IT initiatives broadly support corporate objectives the company can expect sub-optimal realization of internal information technology due to a number of business-IT alignment issues. A number of opportunities exist for XYZ to address sources of misalignment. These are as follows:

- Introducing incentives for Internal Operations to address the potential undersupply of public internal systems and internal-R&D effort;
- Incorporating a valuation framework into IT planning to enable higher quality prioritization; and,
- Assigning business champions to IT initiatives to maximize business benefits.

5.1 Motivating Internal Systems Development with Incentives

An incentive system for Internal Operations provides an opportunity to address the potential undersupply of internal systems development and raise the performance of R&D activities in general. An effective incentive system must satisfy three goals. The main objective is to increase the performance of Internal Operations for tasks specific to internal systems. Additionally, the system should be cost-effective and be straightforward to implement – XYZ has no dedicated HR function and senior management has limited expertise and availability to implement and monitor an elaborate system. Lastly, the incentive system must utilize individual performance measurement

and individual rewards to minimize free-riding (Vining, 2003). Any system will make use of the performance assessment process already defined by Internal Operations. This process monitors individual performance on a per project basis and is therefore a suitable foundation.

From the management literature, an incentive system based on reinforcement will likely be more effective than one based on rewards. The performance assessment process used by Internal Operations already incorporates feedback and does so interactively, reflecting a reinforcement approach. Research findings in the field of reinforcement and incentives (Luthans & Stajkovic, 1999) are a practical starting point for developing an incentive system. Monetary or social recognition reinforcement may complement the performance feedback already present. In determining the expected productivity gain of a particular reinforcement combination the above research distinguished between the availability of hard vis-à-vis soft performance information. Internal Operations collects both types of data therefore the average of the productivity gain identified in the research is appropriate for Internal Operations.

The cost and effort to implement a particular incentive structure is predominantly a function of monetary reinforcement. Devising a fair and objective financial-based incentive structure will require the appropriate budgeting, time, and commitment from senior management. However, social recognition requires only a modicum of effort to provide. Table 4 summarizes various incentive structure approaches.

Table 4: Incentive Structure Approaches for Internal Operations.

	Performance feedback only (existing system)	Performance feedback and social recognition	Performance feedback and monetary reinforcement	Performance feedback, monetary reinforcement, and social recognition
Expected performance improvement	23.5%	35.5%	30.0%	26.5%
Effort to implement	Low	Moderate	High	High
Cost to implement	None	None	High	High

Source: author, based on research findings by Luthans & Stajkovic, 1999.

Expected performance improvement is the most important goal and the underlying motivation behind the incentive system. Effort is a secondary but significant objective: any incentive approach, regardless of structure, requires careful design and monitoring. Cost is the least important goal as monetary incentives need only meet budget constraints. An important note is that the expected performance improvements listed reflect empirical findings from past research. Actual performance improvements will depend entirely on the specific environment in which the incentive system is deployed.

The approaches presented provide useful starting points for designing an incentive system. Of note is that these approaches all require reinforcements of performance generating behaviour rather than reactive rewards. Additionally, any incentive structure requires ongoing monitoring and review to maximize effectiveness.

5.2 Improving Planning with Benefit Estimation Methods

Qualitative methods to evaluate IT initiatives present an opportunity for higher-quality prioritization and greater decision-making proactivity at the strategic and department level. A deeper understanding of the benefits and risks of internal and customer-related projects alike affords Internal Operations management greater

efficiency in project scheduling and contingency planning. From a strategic perspective, additional evaluation flexibility allows senior management to understand the impact of initiatives on competitive advantage and organizational efficiency. Additionally, evaluation tools provide an opportunity to manage the expected increase in urgent customer requests.

Intuition plays a major role in XYZ's existing ad hoc approach to prioritization and benefit estimation. Increasing industry competition has the effect of increasing the opportunity cost of strategic initiatives. By relying only on existing valuation methods the firm stands to realize greater losses in competitive advantage through inferior prioritization.

To be useful, valuation methods must allow for the uncertainty associated with estimating the business benefits of the company's IT efforts. The company's existing growth strategy promotes strategic initiatives, many of which require business process changes in their value realization. Developing Callisto's CRM capability is one such example. Some initiatives involve technical risk not easily quantified, such as integrating Callisto with suppliers' databases. Additionally, overlap between internal and services-R&D introduces strategic implications into many smaller projects.

Suitable evaluation methods need to be qualitative in nature and complementary in the insights they provide. The IT-Goal Focus, CSF impact, value chain impact, and risk discounting methods identified in Section 4.2 are potentially suitable candidates for IT initiative evaluation at XYZ. Their advantage lies in the ability to combine them into a flexible toolkit that supports decision-making. Incorporating use of this toolkit into

formal governance processes is an additional opportunity to improve decision-making quality.

5.3 Securing Business Accountability for IT Initiatives

Assigning business champions to IT initiatives provides an opportunity to realize greater business benefits from IT. Maximizing business benefits from IT is critical in any competitive industry. At XYZ, lost business benefits may result in reduced competitive advantage.

The company President is presently responsible for ensuring realization of IT project business benefits. However, demands on the President's role limit business accountability for these initiatives. As the organization grows in size and complexity, demands upon the President's role increase and further reduce the effectiveness of this approach.

The primary goal of incorporating business champions into internal development is maximization of business benefits for internal IT initiatives. Depending on the nature of the initiatives in question, implications range from improved strategic position to greater organizational efficiency. Another goal of introducing the business championship role is improvement of the business-IT relationship. IT and business functions already share mutual trust and respect, however frequent change creates friction. The business champion role has the potential to address this tension by streamlining the adoption of new systems and functionality. A smoother relationship affords greater utilization of newly added internal systems or functionality and results in higher productivity.

The business champion role must be compatible with the company's organizational structure. Additionally, every major IT initiative should have a business champion as driver. While changes to the business champion process are inevitable, existing projects are an opportunity to develop familiarity with the role and fine-tune decision-making, budgeting, and responsibility.

By regarding IT initiatives as vision-to-value vectors, XYZ can develop a deeper understanding of the costs, investments, and risks involved in initiatives – and their relationship with business champion responsibilities. Champions take ownership and accountability of the vector, and continually monitor it throughout its lifespan. Clearly defining roles and responsibilities, monitoring initiative progress, and reviewing the business champion role itself are additional ways to realize the advantages of this strategic opportunity.

6 STRATEGIC IT RECOMMENDATIONS FOR XYZ

XYZ's IT strategy is instrumental in developing internal systems that support continued growth. Internal R&D efforts continue to deliver systems that enable the company's competitive advantage. The capabilities of the R&D function are a testament to the company's strong alignment between business and IT strategy.

Company growth and increasing industry competition place rising importance on the role of internal R&D. In response, the company is increasing the capacity of its R&D function. However, several sources of misalignment between business and IT strategy reduce the ability of R&D to provide internal systems and limit the value that XYZ can realize from these systems. The company must address these sources of misalignment or risk losing its competitive advantage.

XYZ has several opportunities to improve business-IT alignment. The company's current focus on internal development supports addressing alignment issues through enhancements to IT strategy.

6.1 Recommendations

These recommendations are enhancements to existing IT strategy and seek to maximize the benefits of internal systems at XYZ. While independent implementation is possible, following all recommendations simultaneously will provide maximum benefits. The recommendations are suitable for immediate implementation.

6.1.1 Introduce an Incentive System for Internal Operations

Senior management should introduce an incentive system incorporating reinforcement through social recognition and performance feedback for the Internal Operations department. Internal Operations must monitor the system and review its effectiveness with senior management. This incentive system will provide company-wide benefits realized through increased development, higher quality support, and faster issue resolution for internal systems.

6.1.2 Build an IT Initiative Evaluation Toolkit

Senior management's planning and decision process for IT initiatives should incorporate qualitative benefit estimating methods. The internal IT steering committee's periodic initiative review process should also incorporate these methods. Additionally, Internal Operations and other departments may use these methods to assist with project evaluation and planning. Senior management will achieve the greatest benefit from the use of these methods.

6.1.3 Define Business Champions for IT Initiatives

Senior management should assign a business champion from within the organization to new and existing internal IT initiatives. Initial definition of the business champion role and subsequent monitoring of the role's effectiveness are essential parts of this recommendation. The department requesting the IT initiative will benefit most. The Sales & Marketing department and administration functions within the Finance & Administration department will benefit significantly from implementation of this recommendation for existing IT initiatives.

6.2 Implementation

This implementation approach outlines procedures and processes for each of the preceding recommendations. As with all new processes, the methodologies described by these implementations require periodic review to improve performance and develop organizational learning.

6.2.1 Introduce an Incentive System for Internal Operations

- In conjunction with Internal Operations management, senior management will develop an incentive system for Internal Operations employees based on performance feedback and social recognition reinforcement. Senior management will also establish a trial period of no less than a single financial quarter in which to monitor performance of the new incentive system.
- As an initial step the Internal Operations manager will update general-purpose and Callisto ticket systems to receive email notifications when tickets are closed, confirmed as closed, or re-opened.
- Upon closure confirmation of complex, severe, or lengthy (high completion-duration) tickets, the Internal Operations manager will send a broadcast email to the department acknowledging and congratulating the employee that closed the ticket. Acknowledgements are to be awarded sparingly and reserved for challenging or demanding tickets. Acknowledgements must be sent as shortly after the closure confirmation as possible.

- At each weekly department meeting, the Internal Operations manager will summarize recent exemplary internal systems development efforts through public acknowledgement.
- At each monthly company meeting, the senior management will summarize recent exemplary internal systems development efforts through public acknowledgement.
- Internal Operations management and senior management will review internal systems development performance weekly through ticket system metrics, and will adjust the incentive structure based on performance results.
- Contingent to a noticeable performance increase within the trial period, senior management will investigate introducing monetary reinforcement in the form of paid time-off commensurate to overtime and performance.

6.2.2 Build an IT Initiative Evaluation Toolkit

- Senior management will add qualitative benefit estimation methods to formal IT planning. In addition to existing valuation techniques, senior management will assess new IT initiatives using the IT-Goal Focus, CSF impact, value chain impact, and risk-discounting methods identified in Section 4.2. Senior management will assess new and existing initiatives using these methods.
- As the steering committee for IT initiatives, senior management will add identified benefit estimation methods to their existing review of IT initiatives.
- Senior management will introduce qualitative benefit estimation methods to Internal Operations for the purposes of planning and scheduling.

- At their discretion, senior management may introduce estimation methods to other departments.

6.2.3 Define Business Champions for IT Initiatives

- Senior management will structure the role of business champion using the Benefits Management Process identified in Section 4.3 as a guideline. This step includes the identification and documentation of responsibilities, budgeting flexibility, staff training resources, performance monitoring methods, and business champion compensation level. Additionally, senior management must carefully monitor and document all subsequent steps comprising the implementation of this recommendation.
- Senior management will identify a suitable existing IT initiative for an initial “trial run”. Senior management will then classify the initiative as a vision-to-value vector (Section 4.2) and determine vector costs, risks, and benefits for each component. Use of the benefit estimation methods identified in Section 4.2 is recommended.
- Senior management will identify candidate individuals to fill the business champion role for the initial trial run. After polling individuals to determine interest and assessing ongoing commitments to check availability, senior management will conduct interviews to establish suitability for the role. To maintain objectivity, no individuals comprising the senior management team will be the business champion for the initial trial.

- Upon selection of initiative and business champion, the trial commences. Senior management will work closely with the business champion to identify any requirements or process changes and will meet weekly with the business champion to review performance of the initiative and the role itself.
- Upon completion of the initiative, the business champion and senior management will review performance and adjust roles, responsibilities, and processes accordingly. Following completion of the trial, the business champion program will be introduced for major IT initiatives.

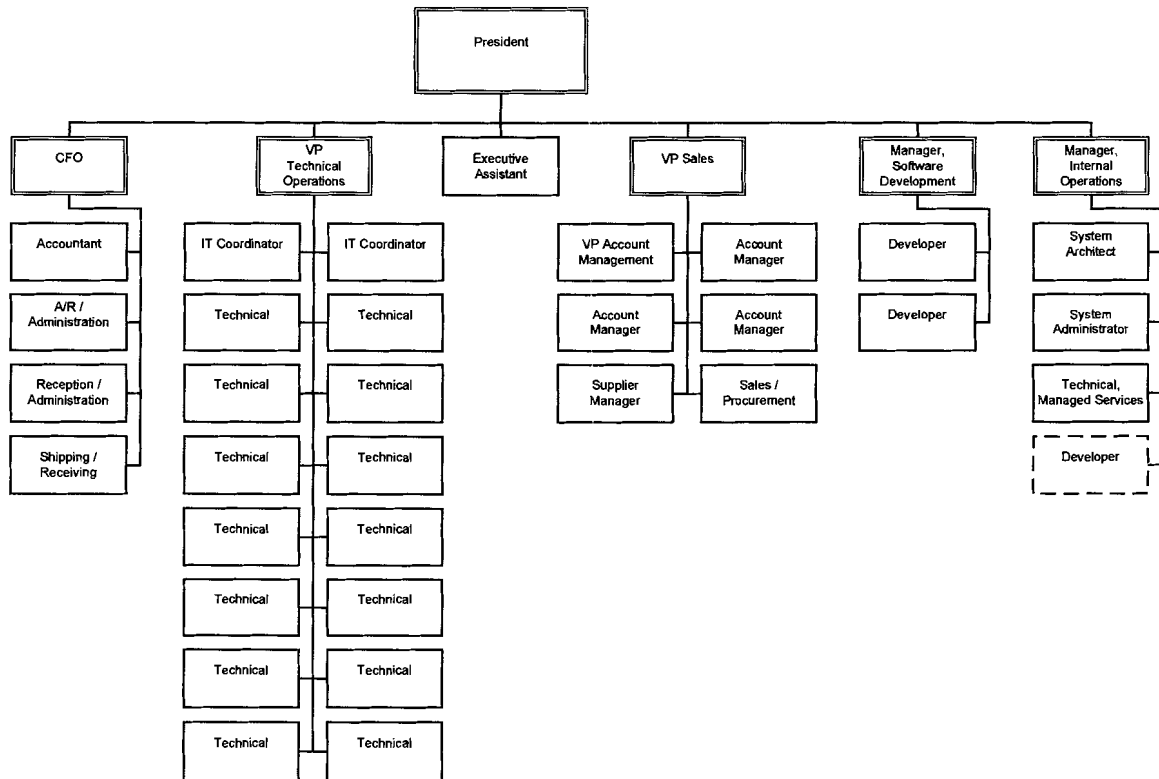
6.3 Concluding Comments

An articulated IT strategy has proved beneficial to XYZ in supporting the company's rapid growth. The company continues to benefit from a relative competitive advantage in the local SME IT services market through the contribution of R&D efforts and internal systems. However, XYZ's advantage is contingent upon their ability to realize internal systems value staying ahead of the existing competition and potential market entrants with access to enterprise technology.

By enhancing IT strategy XYZ can improve alignment between business and IT in a number of key areas. Superior alignment strengthens internal R&D and improves the company's ability to realize value from internal systems. XYZ possesses the core competencies to take advantage of enhancement opportunities for IT strategy. In doing so, the company improves their IT capability in a manner not easily visible to competitors and moves towards developing a sustainable competitive advantage.

APPENDICES

APPENDIX A: Company Org Chart



Source: author, from data provided by President, XYZ Solutions Inc., October 2005.

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