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15.571 Generating Business Value from Information Technology
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AETNA

Project

Business Model for Health Information Exchange

Objective

Conduct research to develop a quantitative foundation supporting a business model for Health Information Exchange ecosystems, with a particular emphasis on monetizing the value of clinical decision support.

Background

In the U.S., federal and state governments are promoting the development of health information exchanges as a way to improve health outcomes and lower systemic healthcare costs.

HIEs are accomplishing this through a combination of electronic health records, health information exchange, clinical decision support, consumer portals, provider portals, performance measures and incentives.

Deliverable(s)

For some of the key ecosystem players (e.g. health plans, employers, health information exchange, doctors, pharmacies, and patients):

- HIE-connected business model description
- Description of value-added, quantified
- Evaluation of potential pricing models
- Description of potential contract models
- Cost structure model, quantified
- Net P&L impact, quantified

Highest priority entities would include health plans, employers, the ActiveHealth components and the HIE.

Key Contact

Frank Norman, EVP and CIO, ActiveHealth Management

BT

Project (Option 1)

IT for the Future Knowledge Worker

Background

Ongoing work in CISR and by researchers such as Tom Malone, Andrew McAfee and Nicholas Carr have shown that the falling costs of IT/communications and the rise of social software are changing the ways that our knowledge workers work.

- In an Enterprise 1.0 world, our knowledge workers existed to feed and water the systems that ran a company's business processes
- In an Enterprise 2.0 world, our IT systems exist to enable our knowledge workers to autonomously execute their roles

We are seeing a number of trends.

- Companies are becoming more decentralized
- The use of informal tools such as blogs and wikis is growing—and they're not well integrated with our formal systems such as workflow
- Our people are more mobile—working from airports and starbucks as much as head-office
- Knowledge workers are becoming more demanding—wanting tools as good as those they use at home and more choice over hardware such as Macs and iPhones

Perhaps most importantly, much of the information and many of the tools that they use are not safely stored inside our firewalls but exist on the internet. Our people are no longer sat on our intranets occasionally looking out on to the internet, but the other way around, they live on the internet occasionally looking in to the intranet.

Current solutions are not very satisfactory e.g.,

- Corporate laptops which use VPN's to become a remote part of the company's LAN may not provide adequate performance on rich internet apps which could have been accessed directly
- Those laptops are also being increasingly being locked down to enforce security policies reducing the flexibility of workers to experiment with new tools.
- The DoD has a related problem in that many of its people have to maintain multiple air gapped desktop machines for each of their secure networks

In parallel, they are being challenged.

- By new ways of working such as powerful laptops running multiple operating systems as VPNs
- By the security implications of Gmail, facebook etc.

Companies are also increasingly looking to “consumerize their IT” by enabling workers to buy their own laptops rather than be issued one, and ‘red-siding’ their networks to allow remote workers to access the companies tools through browser based portals. The risk is that half of the people have corporate laptops that have great access but are unusable, and half end having great usability but inconsistent access.

As a result, the old model of inside and outside is breaking down—and the boundary between them is becoming more and more troublesome.

Possible Methodology

Through interviews with industry partners and relevant faculty at the Sloan School and elsewhere at MIT, and offline research

- Identify key trends in the use of IT by knowledge workers
- Identify key points of tension and where IT departments are struggling to rationalize competing world views
- Generate some hypotheses and possible futures (e.g., Are cloud based solutions the way forward?)
- Develop a simple representation that enables CIOs to think about the issue

Deliverable(s)

A short analysis and thought leadership report

Key Contact

Steve Whittaker, Head of US University Program, BT Group CTO/Strategic Research

Project (Option 2)

Communication Enabled Business Processes

Background

One of the key developments of the last 10 years has been the re-convergence of the computing and communications industries. The growth of Voice-over-IP compared to switched telephony, the emergence of smart mobile devices handling SMS, email and IM are examples of this. This is the playing out of the 'bits-are-just-bits' and 'software-is-just-software' trends of convergence.

Communication tools, such as the phone, have ceased to be architectural silos but become applications such as softphones using standards such as SIP.

Now, increasingly, they are becoming components—wrapped in API's which enable them to be combined into other applications or workflows, for example, a webpage or SAP application. In effect, the capabilities which were previously only available in closely integrated call centers are now becoming available throughout the application space from ERP and workflow to social networking tools and consumer devices such as set-top-boxes and smartphones.

Communication Enabled Business Processes (CEBP) allows Unified Communications (UC—the integrated management of voice, email, IM etc) to be integrated with business processes, increasing the reliability and reducing the latency of processes involving people in order to improve overall efficiency and effectiveness.

As an example, as part of its 21st Century Network, BT has been pursuing a strategy of providing simple API's to its network based 'common capabilities' and also has recently purchased open-communications startup Ribbit—which itself integrates with Salesforce.com (to voice and mobile enable Software-as-a-Service CRM), Adobe flash/Air, facebook, iGoogle etc.

- What opportunities does this trend provide for the enterprise?
- Will cloud-based universal-communications merge with cloud IT?
- What could it mean for industry structure and how enterprises select strategic IT and application partners?
- What does ubiquitous voice, video and messaging mean for how companies work internally and how they work with their customers?

Possible Methodology

Through interviews with industry partners and relevant faculty at the Sloan School and elsewhere at MIT, and offline research

- Investigate the state of the art in UC and CEBP and their adoption
- Investigate some of the emerging applications
- Investigate how telecom, IT, platform and enterprise application companies are approaching the opportunity
- Develop a simple framework to help IT executives understand what kinds of processes could be usefully communication enabled.

Deliverable(s)

A short analysis and thought leadership report

Key Contact

Steve Whittaker, Head of US University Program, BT Group CTO/Strategic Research

Project (Option3)

IT Hits the Wall

Background

Since the development of the earliest microprocessors, the cost-performance of computing has increased regularly in line with Moore's Law. As feature sizes on chips have shrunk, we have been able to pack more transistors on to those chips and run those transistors faster and faster. For example in 1971, the Intel 4004 used a 10 micrometer technology, had 2,300 transistors and ran at 108Khz. Today's Intel processors use a 45 nanometer technology, have over 800,000,000 transistors and run at 3GHz.

That exponential improvement in price performance has enabled IT to permeate every aspect of the enterprise—driving substantial efficiencies and enabling completely new ways of doing business. Although Nicholas Carr suggested that these efficiencies were temporary and 'IT doesn't matter' Erik Brynjolfsson showed that you could identify the effect clearly in economic performance. Because we had also stabilized our operating systems and modularized our architectures, IT departments could reliably update their hardware regularly to run the same applications at greater and greater scale for similar costs.

However, suddenly we have hit a wall. Although, we can still make the transistors smaller (45nm with become 22nm and then 16nm), we can no longer run them faster. The issue is the heat that's generated is so great that the chip temperatures begin to rise dangerously. To a great extent, this took the industry by surprise and established industry road maps had to be rewritten.

As a result, rather than having a single processor on a chip which gets faster and faster, we're now seeing multiple processor cores on each chip—currently 2 to 4, but potentially many more.

The issue is whether we can write software which can keep up with the improved hardware. Writing an application that can run efficiently on blades with dual-core processors is very different from using ones using on 100 core processors. There are concerns that there are not enough developers with the right skills, and that a new set of abstractions and tools will be required—although some people think that the techniques developed for cloud computing (such as hardoop) may also work within chips (chips as clouds).

Clearly, this change will enable new classes of applications which are well suited to parallel processing such as molecular modeling, but what about the mainstays of enterprise IT such as ERP, databases etc?

- Will Oracle, SAP, salesforce and the others be able to take advantage of the increased capability going forward, or will there be an opportunity for newer players?
- Will enterprise IT be able to keep up or will we see the end of the cycle of economic efficiencies?
- Will this accelerate a move to the cloud?
- Is this a big deal or not?

Possible Methodology

The CS community and the computing industry are beginning to understand this issue, but it has not yet been framed in a way that can inform CIO's and policy makers.

1. Discuss the issue with

- Faculty in CSAIL working on various aspects of this challenge
- Faculty at Sloan working on the economics of IT and the structure of the industry
- Industry partners at various layers such as Intel, Microsoft, SAP, BT

2. Develop some hypotheses and future scenarios

Deliverable(s)

A short analysis and thought-leadership report

Key Contact

Steve Whittaker, Head of US University Program, BT Group CTO/Strategic Research

EMC

Project

EMC's IT Transformation.

Objective

Support EMC's transformation with an analysis of the firm's IT governance and IT organizational model.

Background

EMC has traditionally been a technology product company. In the last few years, a series of acquisitions has converted EMC into more of a services provider, although storage products remain an important part of EMC's business. The acquisitions and the new business demands of the service business have increased the variability of EMC's technologies and business processes. EMC is examining the IT organization to determine how best to meet the needs of its increasingly diverse businesses. This project would help EMC's IT unit identify needed changes to its IT governance and organizational structures based on discussions with key managers at EMC and research on other organizations.

Deliverable(s)

Analysis of existing IT governance and IT organizational model; recommendations for changes.

Key Contact

Ken LeBlanc, Senior Director, Office of the CIO, EMC

RAYTHEON

Project (Option 1)

Measuring Business Value from Information Technology at Raytheon

Purpose

Determine how we “know” when IT generates business value for one of Raytheon's major businesses or enterprise functions, and how we measure this fact.

Scope

For Raytheon's six (6) major businesses¹ and nine (9) major enterprise functions², for whom IT currently delivers "business value", usually in the form of projects and/or services, determine how they view IT and IT value, and how they measure business value delivered, if they do so. Determine if there are significant differences amongst businesses and amongst enterprise functions in how they determine IT value, and how they make decisions based on this measurement. If possible, also propose methods for self-regulation and self-governance to provide demand management (controlling growth of demand for services or systems to only that which is truly necessary and valuable to the organization and to the company).

Deliverable(s)

For each major business and each enterprise function, provide a description and/or comparative "map" of how they measure IT value to their organization.

Why Important

To help our CEO and CIO determine the best investments to maximize IT Value across the enterprise, we need to know how it is recognized and measured by many different non-IT groups.

Point-of-Contact

Tom Lydon, Director & Staff Executive, Office of the CIO

¹Major Businesses (6) ²Major Enterprise Functions (9)

IDS -	Integrated Defense Systems	Business Development
IIS -	Intelligence & Information Systems	Communications
NCS -	Network Centric Systems	Contracts
RMS -	Raytheon Missile Systems	Engineering
RTSC -	Technical Services Company	Finance
SAS -	Space & Airborne Systems	Human Resources
	Information Technology	
	Legal	
	Supply Chain	

Project (Option 2)

Generating Business Value from IT—RSpace Social Networking initiative

Background

- Raytheon has begun to pilot the use of social networking software but will need to strengthen the internal consensus on the value of investment in this area in order to move towards a full scale deployment. The rapid growth and fast adoption rates of these software solutions in society indicate a clear desire and interest in these solutions, however work remains to define the solid business value from an investment in this technology. The challenge would be to work with us to uncover the value beyond the wow factor for social software for Raytheon and to help us identify the critical success factors for a high-value implementation.

Purpose of Project

- Analyze how Raytheon can generate the maxim business value from its social networking initiative—What are the critical success factors?
- Provide support for the development of the value proposition that will be needed to transition the current pilot to a full enterprise-wide production environment

Scope

- Analyze the potential value to Raytheon of deploying the social networking tools included in the IBM Connections suite when integrated with Notes, Sametime, and...
- Analyze the impact of potential risks or barriers such as security concerns, international barriers to knowledge sharing (e.g., international trade restrictions), and cultural issues (e.g., concerns about "too much socializing")
- Analyze the critical success factors and leverage points for a successful deployment

Deliverable(s)

- Description of the critical success factors
- Multi-year projection of the qualitative and quantitative benefits for deployment
- Assessment of risks and possible unintended consequences along with suggested mitigations for them
- Suggestions for creating a compelling business case for full-fledged deployment.

Why Important

Raytheon is a large knowledge-intensive enterprise. Becoming more effective to leveraging its combined knowledge and increasing rates of individual and organizational learning are critically important to its continued well being. In addition, many of Raytheon's customers have similar drivers and Raytheon has the opportunity to develop a social networking competency that can provide value to its customers. However, a consensus on the need to invest in social networking technology does not yet exist and this will need to be achieved in order to move forward aggressively.

Key Contact

Tom Lydon, Director & Staff Executive, Office of the CIO

STATE STREET

Project (Option 1)

How Much Cheaper is Off Shore?

Objective

To support State Street's decision making process regarding whether IT processes should be moved offshore and, if so, what principles should be followed.

Background

State Street wants to move from a time-based model of outsourced systems development to an output model.....buying deliverables. Although the firm has already started to move offshore, some questions remain. This project would examine questions like:

- What are the output metrics (function point, test coverage... etc.), what is the measurement system...
- What IT and management processes need to be put in place to make this work?
- How will impending IT unemployment in the US reshape the Asian suppliers?

This project will involve interviews at State Street and a review of existing research on offshoring.

Deliverable(s)

Report providing analytical support and recommendations to State Street's IT managers.

Key Contact

Chris Perretta, CIO

Project (Option 2)

Driving Reuse Across the Enterprise.

Objective

Support State Street's efforts to define structures, methodologies and processes to enable reuse of systems across business units and geographies.

Background

Much of the competition in the financial services industry is based on speed to market of new products and services. Most of these products and services are IT-based. Thus, IT units are under pressure to accelerate delivery of new systems. One way we expect to accelerate delivery is through reuse of system and process components that are used by multiple products and services. System reuse requires different approaches to designing, building, and implementing software. This project should identify how State Street's IT unit can better position itself for system and process reuse.

Deliverable

Analysis and recommendations to State Street's IT managers.

Contact:

Chris Perretta, CIO

Project (Option 3)

Organizing for Data Driven Development and Risk Management

Objective

Help IT executives at State Street identify alternative structures, processes, and roles that organize IT around data rather than business lines.

Background

The need for instant access to data across the enterprise is crucial (Think : “What’s our exposure to Company A, or how much do we have in Product B or products like B), but we tend to organize around business lines, or applications within business lines. This project will examine, through existing research and interviews with State Street managers, alternative IT unit designs that would help State Street’s IT organization address important data requirements of the company.

Deliverable(s)

Report and recommendations to IT executives

Contact

Chris Perretta, CIO.