The Context & Basic frame of reference: The Information Systems Strategy Triangle

Business Strategy

Organizational Design

Information Systems Portfolio

Requires a Business Process Perspective (BPP)

With the Manager in the coordinating role
A Business Process Defined

A business process is a set of logically related business activities that combine to deliver something of value (e.g., products, services, or information) to a customer. (Cousins and Stewart, RivCom, 2002)

A way of seeing organization and what it does beyond the traditional functional or departmental view.

Business process can be viewed as discrete steps or collectively as a set of activities creating value.

The notion of the ‘Value chain’

Key idea: Process and efficiency vs. product development and differentiation
Properly understood an managed process are like....

Customer fulfillment ➔
In-bound logistics ➔
Distribution ➔
Service ➔
Marketing ➔

What is innovation?

- Dictionary-style ...
  - The act or process of inventing or introducing something new
  - Something newly invented or a new way of doing things
  - The process of adopting a new thing, idea, or behavior pattern into a culture
  - The act of starting something for the first time; introducing something new

- Authors on innovation ...
  - Leifer, et.al. (Radical Innovation, HBP, 2000)
    - Producing an outcome with:
      - An entirely new set of performance features
      - Improvements in known performance of 5x or greater
      - A significant (30 reduction) in cycle-time and/or cost
  - James March
    - Exploration vs. Exploitation
What types of innovation?

Christensen and Overdorf, “Meeting the Challenge of Disruptive Change”

I. Sustaining innovation (exploitation):
Successful companies are good at responding to evolutionary changes in their markets
- Makes a product or service perform better in ways that mainstream customers already value
- Typically developed and introduced by industry leaders

II. Disruptive innovation (exploration):
Where they run into trouble is in handling revolutionary changes in their markets
- Creates entirely new market by introducing a new product or service that mainstream customers initially sees as worse
- No company has a routine for handling them
- More difficult for large, mature companies, easier for smaller, immature companies

The roots of Business Process Innovation (BPI)

Business Process Innovation

The quality movement
Scientific management
Work design
Diffusion of innovation

Increasing change pace
1. Inspections
2. Continuous improvement
3. Process innovation

Adapted from Christensen & Overdorf (2000)

The decade of BPI

Definition: **Business process fusion** is the transformation of business activities that is achieved by integrating previously autonomous business processes to create a new scope of management capabilities.

Gartner October 2003

Synonyms: agile business, self-service enterprise, virtual organization, process-focused ...

The drivers behind BPI

- **Need for agility, flexibility**
- **Regulatory pressures**
  - I/T development
  - BP Standards (Rosetta, ebXML, w3c, Oasis, OMG, ...)
- **Cost pressures, efficiency**
  - Finance/accounting
  - Trade/govt policy
  - Sarbanes, BASEL
- **Process improvement**
  - Variance reduction
  - Professional org (Quality, Lean, IEEE, ...)
- **Industry leaders**
  - (GE, GM, Dell, Wal-Mart, Ashland, ...)
- **CxO best practices**
  - (CIO, COO, CFO, ...)
- **Thought leaders**
  - (Gartner, Meta, HBR, ...)
- **Innovation**
  - Technology platforms (SAP, Oracle, IBM, MS, ...)
  - Platform Vendors (Accenture, CSC, EDS, ...)
  - Academics (Gartner, Meta, HBR, ...)
  - Consultancies (Accenture, CSC, EDS, ...)
  - Adopting industry “best practices”

Maintaining technological currency
BPI covers end-to-end

VALUE THREAD: An End-to-End Business Process

1st – Nth Tier Operations Suppliers

1st – Nth Tier Customers

Operating Resource Suppliers

Outsourcing Partners

Follow the then-what-chain

Course Components

Business Model Toolbox for iPad

Work Systems Method
A Business Model

- Wikipedia says...
  - “business model
    noun...
    a design for the successful operation business, identifying revenue sources, customer base, products, and details of financing: many of the free sites have either shifted their business model or have gone out of business completely.”
**Taxonomy of a Business Model**  
(Rappa and Timmers)

- **Brokerage**
  - Company acts as a market maker; charges fee for the service
  - Types: buy/sell, exchange, distributor, virtual mail, metamediary, auction broker, reverse auction, classifieds, search agent

- **Advertising**
  - Content attracts visitors; advertisers pay for the exposure
  - Types: generalized or personal portal, specialized portal, attention/incentive advertising, fee market and bargain discounter

- **Infomediary**
  - Collects info on visitors and sells it
  - Types: recommender vs registration model

- **Manufacturer**
  - Direct access to customer, by pass middleman

- **Merchant or e-tailer**
  - Types: virtual, catalog, surf&turf, bit vendor

- **Affiliate**
  - Click though relationships

- **Community**
  - Capitalize on relationships

- **Subscription**
  - Pay for high(er) quality or more timely content

- **Utility**
  - Pay as you go for service
Customer Value

- Where does value come from/how is it made evident to your customer?

  - Differentiation
    - How do your products or services differ, what do they offer that others do not?

  - Scope
    - Properly identifying where and to whom to offer the product at the proper price

  - Pricing
    - Charging what the product is worth to the customer
    - Charging exactly the ‘right’ price

Customer Value: Differentiation

- Product features
  - Speed, specialized content, personalized product

- Timing
  - First to market

- Location
  - Ease of access
  - In info goods: PDA, cell phone, telephone...

- Service
  - Help desk; repairs

- Product Mix
  - Choice
  - Mass customization and personalization

- Linkages
  - Who endorses you
  - Co-branding

- Brand Name
  - “it’s the real thing”

- Low Cost
  - Perception of the ‘best’ value
Business Model vs Strategy

Joan Magretta, Harvard Business Review May 2002

Terms often and incorrectly used interchangeably

• The Business Model tells a good story
  – Who is the customer; what does the customer value; what is the basic economic logic; how do we make money in this business; How do we deliver value at appropriate cost…?

• Strategy addresses the competition
  – maps out how you will do better than the competitor
  – How will you add value, be different, change the rule, block the competition, ‘run’ in face of competition, ...

Consider WalMart to understand the difference between model and strategy.

The Information Systems Component

Enterprise Architectures as...
Enablers of Business Models, change agents, competitive weaponry, cost and service differentiators.....

The magic “I” word
The systems landscape we'd like to have

The Result of Traditional System Implementation Approaches

From Weil, Ross, Robertson, 2009
Managing the architecture(s):
Infrastructure architecture vs. Integration Architecture

**Infrastructure:** “Like managing a public good”
- Cost
- Efficiency
- Reliability
- Future capacity

Central authority (steering committee)

**Integration:** “Like managing business contracts”
- Predefined agreements
- Clear depiction of need
- Contractual units of service
- Business unit goals

Goals of Infrastructure Management

**Organizational Processes**

**Infrastructure Architecture**
- Reduce redundancy in IT services and providers
- Reduce heterogeneity of components across business lines

**Integration Architecture**
- Ensure reliability, availability and scalability
- Integration across Applications
- Facilitate ease of communication with internal & external partners
- Manage enterprise data resources
**Definition of enterprise architecture**

- The enterprise architecture is the organizing logic for business process and IT capabilities reflecting the integration and standardization requirements of the firm’s operating model.

- Enterprise architecture is *not* just the sum of the technology architecture, applications architecture, and data architecture.


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**There Are Four Operating Models**

<table>
<thead>
<tr>
<th>Business Process Integration</th>
<th>Coordination</th>
<th>Unification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td>Unique business units with a need to know each other’s transactions</td>
<td>Single business with global process standards and global data access</td>
</tr>
<tr>
<td><strong>Examples:</strong></td>
<td>Merrill Lynch GPC, PepsiAmericas, MetLife</td>
<td>Southwest Airlines, Dow Chemical, UPS Package Delivery</td>
</tr>
<tr>
<td><strong>Key IT capability:</strong></td>
<td>access to shared data, through standard technology interfaces</td>
<td>enterprise systems reinforcing standard processes and providing global data access</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business Process Standardization</th>
<th>Diversification</th>
<th>Replication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong></td>
<td>Independent business units with different customers and expertise</td>
<td>Independent but similar business units</td>
</tr>
<tr>
<td><strong>Examples:</strong></td>
<td>Johnson &amp; Johnson, GE, ING</td>
<td>Marriott, CEMEX, ING DIRECT</td>
</tr>
<tr>
<td><strong>Key IT capability:</strong></td>
<td>provide economies of scale without limiting independence</td>
<td>provide standard infrastructure and application components for global efficiencies</td>
</tr>
</tbody>
</table>

Different Standardization Requirements of the Four Operating Models

<table>
<thead>
<tr>
<th>Business Integration</th>
<th>Coordination</th>
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</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Customer and product data</td>
<td>Operational and decision making processes</td>
</tr>
<tr>
<td></td>
<td>Shared services</td>
<td>Customer and product data</td>
</tr>
<tr>
<td></td>
<td>Infrastructure, portal, and middleware technology</td>
<td>Shared services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infrastructure technology and application systems</td>
</tr>
<tr>
<td>Low</td>
<td>Diversification</td>
<td>Replication</td>
</tr>
<tr>
<td></td>
<td>Shared services</td>
<td>Operational processes</td>
</tr>
<tr>
<td></td>
<td>Infrastructure technology</td>
<td>Shared services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infrastructure technology and application systems</td>
</tr>
</tbody>
</table>

Companies gradually mature enterprise architecture and build out their platforms.

<table>
<thead>
<tr>
<th>Business Silos</th>
<th>Standardized Technology</th>
<th>Optimized Core</th>
<th>Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locally Optimal Business Solutions</td>
<td>Enterprise-Wide Technology Standards</td>
<td>Standardized Enterprise Processes/Data</td>
<td>Standard Interfaces and Business Componentization</td>
</tr>
</tbody>
</table>

Business Agility

- 25%
- 46%
- 27%
- 2%

% of Firms
Architecture maturity increases global agility.

Global Agility

Local Flexibility

Business Silos
Standardized Technology
Optimized Core
Business Modularity


IT spending changes as architecture matures.

Strategic Implications of IT

Local/Functional Optimization
IT Efficiency
Operational Efficiency
Strategic Choices

IT Budget

IT budgets are based on a 2007 survey of 1508 IT executives. Business silos budget is the baseline. Budgets for other stages are represented as a percentage of the baseline budget.
Enterprise architecture benefits by stages

Architecture maturity is a learning process.

<table>
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<tr>
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<th>Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Capability</td>
<td>Local IT applications</td>
<td>Shared technical platforms</td>
<td>Enterprise-wide hardwired processes or databases</td>
<td>Plug and play business process modules</td>
</tr>
<tr>
<td>Business Objectives</td>
<td>ROI of local business initiatives</td>
<td>Reduced IT costs</td>
<td>Cost and quality of business operations</td>
<td>Speed to market; strategic agility</td>
</tr>
<tr>
<td>Funding Priorities</td>
<td>Individual applications</td>
<td>Shared infrastructure services</td>
<td>Enterprise applications and data stores</td>
<td>Reusable business process components</td>
</tr>
<tr>
<td>Who Defines Applications</td>
<td>Local business leaders</td>
<td>IT and business unit leaders</td>
<td>Senior management and process leaders</td>
<td>IT, business and industry leaders</td>
</tr>
<tr>
<td>Leadership Tasks</td>
<td>Measure and communicate value</td>
<td>Lead change</td>
<td>Design and fund shared IT services</td>
<td>Define digitized platform</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Monitor standards and exceptions</td>
<td>Align project priorities with enterprise objectives</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Define, source and fund business and IT modules</td>
<td></td>
</tr>
</tbody>
</table>

Firms learn by building management competencies.

- **Architecture Planning and Design**
  - Senior executive oversight
  - Enterprise architecture guiding principles
  - Enterprise architecture graphic
  - Process owners
  - Full-time enterprise architecture team

- **Project Management**
  - Project methodology
  - Post-implementation assessment
  - IT program managers
  - Business leadership of project teams

- **IT Funding**
  - Business cases
  - Centralized funding of enterprise apps
  - Infrastructure renewal process
  - IT Steering Committee

- **Standards Management**
  - Architects on project teams
  - Technology research & adoption process
  - Architecture exception process
  - Formal compliance process
  - Centralized standards team

Management practices within each practice set are statistically significantly correlated with each other. All four competencies are significantly correlated with architecture benefits.

Firms build competencies in stages.

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<th>Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Cases</td>
<td>Architects on Project Teams</td>
<td>Process Owners*</td>
<td><em>Enterprise Architecture Graphic</em></td>
</tr>
<tr>
<td>Project Methodology</td>
<td>IT Steering Committee</td>
<td><em>Business Leadership of Project Teams</em></td>
<td><em>Post-Implementation Assessment</em></td>
</tr>
<tr>
<td></td>
<td>Architecture Exception Process*</td>
<td>Senior Executive Oversight*</td>
<td><em>Technology Research and Adoption Process</em></td>
</tr>
<tr>
<td></td>
<td>Formal Compliance Process*</td>
<td>IT Program Managers</td>
<td><em>Full-time Enterprise Architecture Team</em></td>
</tr>
<tr>
<td></td>
<td>Infrastructure Renewal Process*</td>
<td>Centralized Funding of Enterprise Applications*</td>
<td><em>Process Owners</em></td>
</tr>
<tr>
<td></td>
<td>Centralized Standards Team</td>
<td>Centralized Standards Team</td>
<td><em>Enterprise Architecture Graphic</em></td>
</tr>
</tbody>
</table>

Legend:
- Architecture Planning & Design
- Project Management
- IT Funding
- Standards Management

* In survey of 120 IT executives, items are statistically significantly related to architecture maturity—they are associated with greater value in later stages.
Top performing companies do three things better.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Low Strategic Effectiveness (n=78 firms)</th>
<th>High Strategic Effectiveness (n=25 firms)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Senior Management Involvement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Senior management explicitly defined architecture requirements</td>
<td>25% (of firms)</td>
<td>44% (of firms)</td>
</tr>
<tr>
<td>• Senior management oversees architecture initiatives</td>
<td>45% (of firms)</td>
<td>60% (of firms)</td>
</tr>
<tr>
<td>• Percentage of senior managers who can describe high level architecture</td>
<td>19% (of mgrs)</td>
<td>39% (of mgrs)</td>
</tr>
<tr>
<td><strong>Architecture Built into Project Methodology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Percentage of project teams with architects assigned</td>
<td>49% (of projects)</td>
<td>81% (of projects)</td>
</tr>
<tr>
<td>• Percentage of projects subjected to architecture compliance review</td>
<td>60% (of projects)</td>
<td>80% (of projects)</td>
</tr>
<tr>
<td><strong>Architecture Maturity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Median Stage (1–4)</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

* Statistically significant difference between the responses of top 25% of firms on strategic effectiveness. Strategic effectiveness is measured as strategic outcomes (operational excellence, customer intimacy, product innovation, and strategic agility) of architecture initiatives weighted by their relative importance to each firm. The top 25% of firms on strategic effectiveness reported significantly higher profitability which correlated with industry adjusted measures of firm-wide profitability.

As the Company’s Architecture Matures, the CIO Role Evolves

<table>
<thead>
<tr>
<th>Key Skills of the CIO</th>
<th>Business Silos</th>
<th>Standardized Technology</th>
<th>Optimized Coral/ Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Technical knowledge to help with standards decisions</td>
<td></td>
<td></td>
<td>Ability to facilitate innovation off new platform</td>
</tr>
<tr>
<td>• Project management expertise to put in place a standard project methodology and ensure its use</td>
<td></td>
<td></td>
<td>Ownership of platform and ability to define IT investment priorities for delivering it</td>
</tr>
<tr>
<td>• Ability to work with top management team to establish basic governance structure</td>
<td></td>
<td></td>
<td>Detailed knowledge of supply and demand chain to begin process of changing overall value chain architecture</td>
</tr>
<tr>
<td>• Ability to make business case for standardization</td>
<td></td>
<td></td>
<td>Ability to delegate ownership of key process and data modules, while still ensuring adherence to standards</td>
</tr>
<tr>
<td><strong>Reports to</strong></td>
<td>CEO or CFO</td>
<td>CEO</td>
<td>CEO</td>
</tr>
<tr>
<td>Percentage of IT Heads with Second Title*</td>
<td>0%</td>
<td>26%</td>
<td>50%</td>
</tr>
</tbody>
</table>

* Percentage of CIOs having second VP title, from samples of 25 CIOs in the United States and Europe.
Roles and responsibilities change as firms transition from transformation to driving value from a digitized platform.

**Governance**

**Build the Platform:** Set priorities and provide focus on critical processes

**Use the Platform:** Establish compliance and exception processes

**Process Ownership Roles**

**Build the Platform:** Create high-powered, full-time team to design and implement transformed processes

**Use the Platform:** Assign high-level process owners; establish centers of excellence and shared services

**People Development**

**Build the Platform:** Provide training required for new roles, new mindset, and unlearning of habits

**Use the Platform:** Develop incentives and accountability for using data and services


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A Dominant Paradigm of the IS Field
(and a serious limitation a.k.a. Problem)

• IS professionals see Systems as IT-based tools that are used by users.

• Whereas Users
  see the business problem

The problem

• Typical ISD Methods used by IT Professionals
  • Are mostly about documentation, not really about analysis
  • Emphasis on precision and completeness
  • Are complex
  • Use opaque terminology
  • Emphasize the use of tools, and
  • do not focus on business performance

• ISD methods expect the user to understand the language, nomenclature, and needs of the IS professional
  • it needs to be the other way round

• The Work Systems Method addresses the communications gap
The Work System Method – ‘quick and dirty’

- Definition of work (what the user sees, does and understands):
  - The application of resources such as people, equipment, time, effort, and money to generate products and services for internal or external customers

- A Work System….
  - A system in which human participants and/or machines (actors) perform work using information, technology, and other resources to produce products and/or services for internal or external customers

Work systems are NOT (just) Information Systems

Figure 4.1: Different types of overlap between work systems and related information systems
Basics of Work System Method

- System and Problem
  - Define an existing system
  - Summarize “as is” using work system snapshot
- Analysis and Possibilities
  - Drill down using work system elements and alignment within the work system
  - Identify extant problems or areas for improvement
- Recommendation and Justification
  - Summarize “to be” using work system snapshot
  - Drill down to understand impact of changes
  - 10 questions related to recommendation and justification
- Result is a kind or pre-requirements or ‘requirements lite’
  - The basis for really in-depth and substantive discussions with a systems analyst
Work System Snapshot

Figure 2.2: Work system snapshot for a loan approval system for loans to new clients

<table>
<thead>
<tr>
<th>Customers</th>
<th>Products &amp; Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan applicant</td>
<td>Loan applicant</td>
</tr>
<tr>
<td>Loan officer</td>
<td>Loan write-up</td>
</tr>
<tr>
<td>Bank’s Risk Management Department and top management</td>
<td>Approval or denial of the loan application</td>
</tr>
<tr>
<td>Federal Deposit Insurance Corporation (FDIC)</td>
<td>Explanation of the decision</td>
</tr>
<tr>
<td>(a secondary customer)</td>
<td>-</td>
</tr>
</tbody>
</table>

Work Practices (Major Activities or Processes):

- Loan officer identifies businesses that might need a commercial loan.
- Loan officer and client discuss the client’s financing needs and discuss possible terms of the proposed loan.
- Loan officer helps client complete a loan application including financial history and projections.
- Loan officer and senior credit officer must verify that the loan application has no glaring flaws.
- Credit analyst prepares a “loan write-up” summarizing the applicant’s financial history, providing projections explaining sources of funds for loan payments, and discussing market conditions and applicant’s reputation. Each loan is ranked for riskiness based on history and projections. Real estate loans all require an appraisal by a licensed appraiser. This task is outsourced to an appraisal company.
- Loan officer presents the loan write-up to a senior credit officer or loan committee.
- Senior credit officers approve or deny loans of less than $400,000; a loan committee or executive loan committee approves larger loans.
- Loan officers may appeal a loan denial or an approval with extremely stringent loan covenants. Depending on the size of the loan, the appeal may go to a committee of senior credit officers, or to a loan committee other than the one that made the original decision.
- Loan officer informs loan applicant of the decision.
- Loan administration clerk produces loan documents for an approved loan that the client accepts.

Participants:

- Loan officer
- Loan applicant
- Credit analyst
- Senior credit officer
- Loan committee and executive loan committee
- Loan administration clerk
- Real estate appraiser

Information:

- Applicant’s financial statements for last three years
- Applicant’s financial and market projections
- Loan application
- Loan write-up
- Explanation of decision
- Loan documents

Technologies:

- Spreadsheet for consolidating information
- Loan evaluation model
- MS Excel template
- Internet
- Telephones

Premises of the Work System Method

- **Assumption**: Business performance is generated by the operation of socio-technical work systems.
- **The goal**: Improving business performance.
- **Improvement of processes**:
  - Changing work systems,
  - not just creating, installing, or using information systems or IT.
- **Links to more formal requirements artifacts (e.g., UML, SOA, etc.)**
  - Decompose work systems into smaller work systems:
    - some of which are sociotechnical
    - some of which are autonomous computerized agents.
Next... We turn attention to a business modeling technique....