Day 3
Information Technology and Changing Business Processes
(a.k.a. Business Process Reengineering or BPR)

CIS Department

Professor Duane Truex III

BUSINESS PROCESS PERSPECTIVE
Transforming business processes

- Two popular concepts for transforming business are:
  - Reengineering or radical process improvement
  - And incremental or continuous process improvement often discussed in the context of Total Quality Management (TQM).
- Both view business as a set of processes rather than a functional hierarchy.

Hierarchical Business Structure

- Hierarchies are typically organized around a set of functions
- Each group has a core competency which it concentrates on.
- Functional groups within a firm tend to complete their portion of a process and “throw it over the wall” to the next group in the value chain.
- This can lower effectiveness, because of the “inward-looking” focus of each functional group.
Hierarchical (functionally-oriented) Structure

Functionally organized firms tend to perform sub-optimally for three reasons:
- Individual departments duplicate information maintained elsewhere.
- Communications gaps often exist between functional groups.
- Functional structure tends to become ingrained, inhibiting reorganization.

Managing from a business process perspective

- managers may take a business process perspective on value creation.
- Each business processes includes the following:
  - A beginning and an end
  - Inputs and outputs
  - Subprocesses that turn inputs into outputs
  - A set of metrics for measuring effectiveness
Simple business process

- Receive requirement for goods/services
- Create and send purchase order
- Receive goods
- Verify invoice
- Pay vendor

Processes cross functional lines

- For example, requirements for goods might originate in the operations department but be based on guidelines from the finance department.
The power of information technology

• “To reiterate, the real power of technology is not that it can make the old processed better, but that it enables organizations to break old rules and create new ways of working—that is, to reengineer.”

  M. Hammer and J. Champy “Reengineering the Corporation”, p 91

What is BPR?

“Business process engineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service & speed.”  Hammer & Champy, 1994

“Process innovation”  Davenport, 1997
Brief History of Business organizations

- 1777 Adam Smith --- division of labor concept
- Eli Whitney and interchangeable parts
- 1900’s Ford implements assembly line
  - based on division of labor and interchangeable parts
  - achieves economies of scale ("you can have any color you want as long as its black")
- 1920’s Alfred Sloan applies Ford’s idea to management of the organization
  - divide business tasks into functional groups {marketing, sales, research, development, mechanical engineering, industrial engineering, manufacturing}
  - vertical hierarchy with many layers of management.

BPR history

- The vertically integrated organization worked.
  - US corporations dominated their markets.
  - 1970’s World begins to change
    - Since Japan and Europe were decimated during WWII all their factories are new.
    - US factories are pre-WWII.
    - Advances in transportation and information technology make the world smaller.
      - Now companies are truly beginning to operate on a global level.
    - The hierarchical organization is not flexible or agile enough to react to market changes!
      - US companies lose market share & profits.
**BPR History**

- Go to flatter organization structures that can respond more quickly to market changes.
  - Less middle management.
- Trend away from companies trying to do everything.
  - Ford’s River Rouge plant had steel and other raw materials coming in and cars exiting the other side.
    - They did everything!
  - Today -- outsourcing of non business core jobs.

**BPR is Not?**

- Automation
- Downsizing
- Outsourcing

*So what then is it?*
Organizational Reengineering

• BPR Changes/improves three areas
  – Plans
  – Process
  – Information

“Business process engineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service & speed.”

Hammer & Champy, 1994

Four key words in the definition

• Fundamental
• Radical
• Processes
• Dramatic

Key Words in Re-engineering

• Fundamental
  – Asks: Why do we do what we do? Why do we do it that way?
  – Forces a reexamination
    • Of rules and assumptions governing conduct of business
  – Try to avoid assumptions underlying processes
    • E.g., How can we perform credit checks more efficiently?
      – Assumes you need to check credit
      – When maybe the cost of bad debt is less than the cost of credit checking
  – Ignores what is and concentrates on what should be
Re-engineering key word (2)

- **Radical**
  - Does not deal with superficial treatment of the old
  - Not incremental improvement
  - Disregards existing structures in favor of reinvented and new way of doing work
  - It is... **Reinvention**

Q: Does this notion strike you as a tad arrogant?

BPR Versus Continuous Improvement

<table>
<thead>
<tr>
<th>Continuous Improvement</th>
<th>Process Reengineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental Change</td>
<td>Radical Transformation</td>
</tr>
<tr>
<td>People Focus</td>
<td>People &amp; Technology Focus</td>
</tr>
<tr>
<td>Low Investment</td>
<td>High Investment</td>
</tr>
<tr>
<td>Improve Existing</td>
<td>Rebuild</td>
</tr>
<tr>
<td>Work Unit Driven</td>
<td>Champion Driven</td>
</tr>
</tbody>
</table>
Key Re-engineering word 3

• Processes
  – A problem word
    • Because most business focused on ‘tasks’, jobs, people, structures, but not processes
  – Business process is
    • A collection of activities that takes one or more kinds of input and creates an output of value to a customer
    • E.g., the delivery of ordered goods in the customer’s hands is the output of a ‘fulfillment process’

Key Re-engineering word 4

• Dramatic
  – Not about marginal or incremental improvements
  – About quantum leaps in performance
  – Digging out of a 10% hole does not require reengineering
    • E.g., in sales projections or cost overruns
    • Here fine tuning is needed
  – Reengineering blows up the old and replaces it with something new
    • It is deployed only when heavy blasting is needed
      – E.g., GM, Xerox…
Process re-orientation examples

**IBM Credit**

- Old: to make a deal required 7 steps, taking 6 days on average
  - performed by specialists
  - deal logger, credit check, modifying standard loan agreement, pricing loan, quote generation
  - But the actual work only took 90 minutes
- New: replaced specialists by generalists each performing several of the steps--delivery in 4 hours
  - How old assumed worst case scenario, the tough cases; new allows or exception procedures
  - Improvement of 100 times or a 90% reduction in cycle time and a hundred fold improvement in productivity

**Ford Motor**

- Old: accounts payable department -
  - 500 people vs Mazda’s 5
- Rethought and designed “Procurement” as a process
  - Included purchase orders, payables, purchasing and receiving
  - Took into account the 80-20 rule (the law of maldistribution)
  - Assumed most of the time the orders and products received did match.
- New: Eliminated the invoice entirely
  - buyer orders and enters order into database.
  - Goods arrive and are accepted iff they are in the database of orders then a check is sent to the vendor.
  - If the goods do not correspond to an order in the database, they are simply refused and returned to the vendor.
- The change? Payment authorization
  - Used to be performed by accounts payable and now is performed at the loading dock
Spends most of their time investigating mismatches

"AS-IS" System

Ford: Invoice-less payables system

"TO-BE" System
The process principle here is that…

– We can only reengineer processes
  • not organizations evolved to accomplish them
  • Accounts payable, a department, was an organizational artifact of a particular administrative design process
  • A big change for Ford and its supplies
    – For now the principle was we pay for the parts when we USE them, until then they are your parts
    – In exchange supplier got all of Fords business
    – You get paid when we get the parts, not weeks later
  • Forced a process rethinking downstream with suppliers
    – They became privy to Ford’s production schedule
    – Integrated information systems required

BPR vs. Streamlining

• Many reengineering efforts are in the middle between reinvention and incremental improvement
  – A combination of solving old problems and redesigning processes
  – Especially when the larger effort is combined with ERP implementation projects
BPR Framework

- **Customer** – whether internal or external, receive product/service or value of the business process.
- **Products (services)** – generated by the business process.
- **Steps** – in the business process.
- **The participants** in the business process.
- **The information** – used or created by the business process.
- **The technology** – used by the business process.

Value in terms of customer

- The customer defines what is of value – not the analyst.
- Need to define the goal(s) of the business process.

- Performance Measures
  - Time
  - Cost
  - Quality
  - Flexibility
Consolidated Methodology

A consolidated methodology has been developed from the five methodologies previously presented and a model was developed to provide a structured approach and to facilitate understanding (Muthu, Whitman and Cheraghi 1999).

BPR

- Embarking on Re-engineering
  - Persuade people to embrace, or at least not to fight the prospect of major change by developing the clearest message on:

1: A “case for action” - Here is where we are as a company and this is why we can’t stay here
  - show your balance sheet
  - show competitors balance sheet

2: A “vision statement” - This is what we as a company need to become
BPR

• Simple Rules
  – Start with a clean sheet of paper.
  • With my current experience what can I do today
  • If I were to re-create this company today, given what I know and current technology, what would it look like
  • How will I be focusing, organizing and managing the company?
  • Transition from a vertical functional department to one that is horizontal, CUSTOMER focused and process-oriented

BPR

• Simple Rules
  – Listen to customer

  – Enhance those things that bring value to the customer or eliminate those that don’t

  – Be ambitious, focus your commitment to radical change on the process
### BPR Improvement vs Innovation/Reengineering

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Increment</th>
<th>Radical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement Sought</td>
<td>30-50%</td>
<td>10x-100x</td>
</tr>
<tr>
<td>Starting base</td>
<td>Existing Process</td>
<td>Blank sheet</td>
</tr>
<tr>
<td>Top management commitment</td>
<td>Relatively low</td>
<td>High</td>
</tr>
<tr>
<td>Role of IT</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Risk</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

### 1. Set the
- Rationale for change
- Senior management understanding and commitment
- Choose processes
- How much? How long? How fast?
- Is organization ready?
- Involve best people

### 2. Manage the Transformation
- How processes work today
- Customer input and competitive assessment
- Magnitude of opportunities
- Vision for new process
- Major changes required for success
- Roadmap for change
- New processes documented and validated
- Key people’s concerns addressed
- Support systems (metrics, rewards, responsibilities) consistent with what we are asking of people
- Critical investments funded
- Major obstacles removed
- Roadmap for action

### 3. Build Value
- Positive customer reaction
- Faster, more effective decision-making
- Evidence of customer-focused behavior
- Business plans reflect new capabilities
- Signs of greater responsiveness to market changes
Process Redesign Heuristics

- Eliminate non-value added tasks
- Capture information once and at its source
- Reduce excessive information flow
- Do tasks in parallel whenever possible
- Group tasks together in time and space
- Have a single point of contact for the customer; or have a case manager
- Reduce the number of hand-offs in a process
- Empowerment
- Outsourcing
- Move controls toward customer
- Integrate with the customer or the supplier
- Consider re-sequence of task based on actual dependencies

BPR Heuristics

- Consider removing batch processing
- Appropriate division of labor (combine small tasks into a single large task) or (divide a large task into smaller simpler tasks)
- Have flexibility in assignment of resources (cross-training, general purpose machinery instead of specialized machinery)
- Treat geographically dispersed resources as if they were centralized
BPR Heuristics (2)

- Minimize number of different departments involved in a business process. (reduces coordination problems)
- Check completeness of information before sending to customers
- Automate tasks
- Use forms and other instruments to reduce data entry load
- Standardize interface with customer

Cautionary notes on the use of the term ‘Best Practice’

- “Needs to be adapted in skillful ways in response to prevailing conditions”
- Generally best practices lack any quantitative support – they are based on one or more experiences.
  - If you asked Henry Ford in the 1920’s for ‘best practices’ in automotive manufacturing he would have responded that is was to build only one model. Then during the 1930s-1940s Ford’s market share dropped from over 50% to 20% due to greater competition and a variety of brands offered by GM.
- Many ERP best practices are nothing more than the way in which the first client performed the process.
BPR in Context of ERP Project

- First, in an ERP project you are **not** conducting BPR as defined by the originators.
  - Hammer and Champy argue for starting with a clean sheet of paper. An ERP project starts with the business processes embedded in the ERP System.
  - The goal is often successful ERP project implementation, improved processes is an expected side benefit.
  - Degree of improvement depends more on how much better the embedded business processes in the ERP system are.
- The German’s have a better name for what is performed in ERP Project: Business Engineering.

Summary

- BPR is part philosophy.
- BPR implies radical change – need ‘buy-in’ of participants.
- Use a methodology
- Heuristics are useful, but often conflict – it is the skillful adaptation of the heuristics to a problem situation.
- BPR and ERP are related but not identical constructs.
  - ERP almost certainly requires process change within a firm
FOOD FOR THOUGHT:
REVOLUTIONARY DESIGN VS
EVOLUTIONARY IMPLEMENTATION

Learning from Reengineering Failures

• Many companies have attempted reengineering, only to fail to realize the benefits they sought.
• Radical change is not an easy task.
• In general, many companies find that too much change too quickly can do more harm than good.
Reasons reengineering fails to meet objectives

• Lack of senior management support at the right time and at the right places
• Lack of a coherent communications program
• Introducing unnecessary complexity into the new process design
• Underestimating the amount of effort needed to redesign and implement the new processes
• Combining reengineering with downsizing

Radical design with evolutionary implementation

• Another approach is to design a radical new process but implement it gradually.
• “Evolutionary implementation”:
  – Reduces the risk of failure
  – Eases adaptation of new processes and
  – Lets individual workers to participate more fully.
• Two problems with this approach are that workers may lose sight of the goal and the target may be moving so that the process, once implemented, no longer meets the firm’s strategic needs.
When revolutionary implementation makes sense

• Revolutionary implementation works for organizations under certain conditions:
  – The change will occur in a small, self-contained unit;
  – A real performance crisis exists and
  – The organization can devote extensive resources to the implementation.

• If these conditions are lack, there is a higher risk of failure with a radical implementation plan.

Wrap Up

• A process-oriented perspective is more than cross functional?
• Technology may radically alter processes and business models in unanticipated ways
A Look ahead…

• Global economies and E-business
• How are they related?
• How do they depend on the concepts learned to date?

Study questions

• What changes allow for a Global e-business perspective?
• What are the essential technology elements needed for this transition?
• The business triangle…now where?