VI. Scoping

Scoping the Problem and the Solution
Choosing Among Alternatives
Example: The Hotel Checkout System
Example: The Computer Books By Mail Corporation
Business Process Reengineering

Two Scoping Steps

- **Scope the problem**
  - ✓ *"Meeting scheduling is too costly right now"* vs
  - ✓ *"We need to improve productivity"*
- **Scope the solution**
  - ✓ *"Build a system that schedules meetings"*, vs
  - ✓ *"Build a system that maintains people's calendars"* vs ...

…And Two More Steps

- **Choose a business process**
  - ✓ *"Ask the secretary, who handles the rest"* vs
  - ✓ *"Negotiate with participants meeting details."*
- **Choose among alternative computerized solutions, given a business process**
  - ✓ *"Computer generates schedule, given request details"*, vs
  - ✓ *"Solution produced by secretary and computer"* ...

Beware of the difference between problems and symptoms!

Scoping the Problem

For the Bookstore example: "Textbooks are often not ordered in time for the start of classes"
- But that's just a symptom, so you ask the manager "why?": "Because we don't receive the booklists from instructors early enough"
- Is that just a symptom of some other problem?…so ask the instructors "why?": "Because the instructors aren't allocated to courses early enough"
- Is that just a symptom of some other problem? …so ask the UG office "why?" "Because we never know who's available to teach until the last minute"
…more…

Scoping the Problem (cont'd)

- *Is that just a symptom of some other problem? …so ask the dept chair "why?": "Because there's always uncertainty about who gets hired, sabbaticals, etc.*
- *Is that just a symptom of some other problem?…so ask the dept chair "why?": "Because instructors we want to hire don't accept our offers early enough"…*
- *Is that just a symptom of some other problem? …so ask the new recruits "why?": "Because some other universities seem to wait for ages before making offers"*
…more…

Scoping the Problem (cont'd)

- *Is that just a symptom of some other problem? …so ask U of Waterloo, etc, "why?": "Because it takes our department a long time to reach consensus on hiring"*
- *Is that just a… …oh wait... …maybe we can develop a decision support system for faculty hiring at U of Waterloo, and that will help us get our textbooks for the start of class…*

Scoping the Solution

- Say you decided that **delay in processing booklists from instructors** is the right level of problem to tackle..."**So, let's computerize submission of textbook forms from instructors**"
- But while we're at it, "**it would help if we also computerized the submission of orders to the publishers**"
  - ...and of course, "**we ought to computerize the management of book inventories too, so we can quickly check stock levels before ordering new books**"
  - ...and in that case, "**we might as well computerize the archives of past years booklists so that we can predict demand better**"

Scoping the Solution (cont'd)

- ...and therefore "**it would also make sense to provide a computerized used book exchange, because that has a big effect on demand for new books**"
- ...and then of course there's ... oh, wait, this is going to cost millions!
  - Bookstore manager: "**tell me again how this automated used book exchange will help me order books faster?**"

Choosing Among Alternative Business Processes

- What is the space of alternatives we are choosing from? There are two dimensions along which we have choices.
- The first (and most important) is between different **business processes**, i.e., between different ways of accomplishing the same task, e.g., handling an invoice, handling a loan application, handling an insurance claim,...

Choosing Among Alternative Business Processes (cont'd)

- Consider the purchasing department of a university:
  - ✓ **Current purchase process**: If someone wants to buy equipment, she requests a purchase order from the purchase order department, purchase order is issued, vendor sends equipment to purchase order department, is paid and equipment is shipped to researcher;
  - ✓ **Alternative process**: Researcher's department issues purchase order, gets equipment, charges researcher's budget
- There are clearly other alternatives as well...

Choosing Among Alternative Computerized Solutions

- For each proposed business process, we can look into what tasks can be computerized, or facilitated by the system to be built,
- For the textbook store example, assume we only want to automate the submission of textbook lists from instructors:
  - ✓ Instructors submit via email, an employee prepares purchase order lists for publishers, or
  - ✓ Instructors submit via email and the system prepares purchase order lists for publishers, or
  - ✓ Instructors submit via email, system prepares purchase order lists which are sent out electronically
  - ✓ ... (web-based alternatives)...

A Hotel Checkout System

Consider a hotel checkout system. Currently, the system is updated twice a day with charges, including room charge per day, room service charges (for such things as snacks delivered to one's room), room video charges (if the customer uses the room's pay-TV), restaurant charges (if the customer dines in the hotel's restaurant and charges the bill to her room) and when the customer leaves, at which time the customer is supposed to mention any recent charges and the bill is paid in full.

Hotel management wants to change the system because there are often billing errors, such as: customers leaving without paying some charges; also, sometimes customers are double-billed because they declare a certain charge, for which they have already been billed. In addition, management expects business to grow because of a major extension to the hotel facility, and is worried that manual updates of customer records will become problematic. Instead, management thinks it may make sense to have continuous on-line updates of customer accounts from the hotel cafeteria (responsible for room service), the pay-TV system (which charges a customer as soon as she starts viewing a pay-TV video) and the hotel restaurant (assume there is only one).

Scoping the Problem

- Current (batch) information system has problems:
  - ✓ Loss of income because of untimely reporting;
  - ✓ Cost of feeding information into the checkout system;
  - ✓ Potential problems with business expansion.
- Alternatives
  - ✓ Stay with current batch system;
  - ✓ Stay with current system but increase number of batch updates per day;
  - ✓ Build new on-line check-out system.
- Selection criteria
  - ✓ Cost (development costs for new system vs higher operating costs for batch system);
  - ✓ Customer convenience/satisfaction;
  - ✓ Reduction of losses due to unreported charges;
  - ✓ ....

The Computer Books By Mail Corp.

The CBM (Computer Books by Mail) Corporation was recently acquired by a national holding corporation and is now a division. Established 12 years ago, the company's business has been to act as book-jobber, receiving orders from librarians for books about computers, ordering the books from the appropriate publisher, at a discount, and filling the order on receipt of the books from the publisher. Invoices are produced by a service bureau computer from forms filled out by CBM staff. Business is currently running at about 100 invoices per day, each with an average of 4 book titles and an average value per invoice of $150.

The Computer Books By Mail Corp.

The new management plans to expand the operation considerably, improving service levels by holding stocks of the 100 most frequently ordered book titles and making it possible for all professionals (not only librarians) to order by calling a toll-free number, 1-800-372-6657 (800-DP-BOOKS, of course) as well as by mail, as at present. This will create problems of credit checking and create the need for an inventory control system of some sort. The people who take the orders over the phone will need rapid access to a catalog of books to verify authors and titles and to be able to advise callers what books are available on any given topic.

The volume of transactions on the new system will, of course, depend on the acceptance of this new method of ordering, but it is projected to grow to 1,000 invoices per day or more, though with a lower average of books per invoice (since librarians tend to order more books at a time than professionals).

Alternative Scopes

- Computerize the order verification process.
- Computerize accounts receivable.
- Integrate order verification, requisitions and accounts receivable.
- Of course, each one of these alternatives will have different budget and project-length implications.

Business Process Reengineering

- Requirements analysis may require changes in business processes, hence business process re-engineering. (BPR).
- BPR calls for a drastic, global restructuring of an organization which eliminates boundary lines between departments and makes the organization focus on the global business processes that define its business.
- For an insurance company, these business processes might be: sellInsurancePolicy, processRenewal, handleInsuranceClaim.
- For a telephone company the business processes might include: sellSubscription, processMonthly-Payment, handleServiceCall, handle-Problem.

Breaking Local Boundaries

- "Conventional" work structure tries to divide up tasks into ever smaller subtasks which are assigned to departments, teams or individuals.
- BPR proposes work teams which collectively take responsibility for a business process and carry it out from start to finish.
- For example, the conventional way of handling insurance claims might be to give each claim to an assessor, who checks it out and passes it on to a lawyer, who makes his recommendation and passes it on to the finance department, etc.

The BPR Way

- *The BPR way, has a team of people handle all aspects of an insurance claim and process it from start to end.*
- *Often, this restructuring reduces wasteful paper shuffling, replaces it with (computerized) information handling.*
- *The members of a team can now identify with each case they handle, get credit/blame for the handling.*

- *BPR got much publicity in the '90s*
- *(…first good, then bad!)*

Additional Readings

[Hammer90] Hammer, M., "Re-Engineering Work: Don't Automate, Obliterate", Harvard Business Review, July-August 1990.

[Hammer93] Hammer, M., and Champy, E., Re-Engineering the Corporation, Harper Business, 1993.