Tutorial notes: Scoping your analysis

- Scoping the problem
  - How do you stop looking for bigger problems to solve?
- Scoping the solution
  - How do you stop yourself from computerizing everything?
- Two case studies:
  - Hotel checkout system
  - Computer Books by Mail

Scoping decision I

→Decide the scope of the problem:

- E.g. 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"
- 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"
- 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…

How to scope the problem

- Difficulty:
  - Every problem can be seen as as symptom of some other (larger) problem
  - You can keep on tracing root causes forever if you're not careful
- Approach: (…ask yourself these questions…)
  - Is there a reasonable expectation that this problem can be solved?
    - (…independently of the larger problem?)
  - Is there a reasonable expectation that solving this problem will help?
    - (…without also solving the larger problem?)
  - Is this a problem that the stakeholders want solved?
    - (do the "local experts" think this problem is the one that matters?)
  - Is this a problem that someone will pay you to solve?
    - (Hint: a feasibility study should quantify the return on investment)

Scoping Decision II

- Decide the scope of the solution
  - Say you decided that delay in processing booklists from instructors is the right level of problem to tackle.
    - "So, let's computerize the 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"
  - …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?"

How to scope the solution

- Difficulty:
  - We could keep on throwing more technology at the problem forever
  - It's hard to decide when to stop adding extra "bells and whistles"
- Approach (…select among alternatives carefully…)
  - Is there a reasonable expectation that this alternative can be implemented?
    - (…independently of all the other options?)
  - Is there a reasonable expectation that implementing this alternative will (help to) solve the original problem?
    - (…without also having to address other aspects of the problem?)
  - Is this a solution that the stakeholders can live with?
    - (do the "local experts" think they would use all these functions?)
  - Is this a solution that someone will pay you to build?
    - (Hint: a feasibility study should quantify the return on investment for each alternative)

Example: A Hotel Checkout System

- Current system:
  - The customer's account 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 movie 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)
  - When the customer leaves she is supposed to mention any recent charges, which are then added to the bill and the bill is paid in full.
- Hotel management want to change it because:
  - there are often billing errors, such as:
    - customers leaving without paying some charges;
    - sometimes customers are double-billed because they declare a certain charge, for which they have already been billed.
  - management expects business to grow
    - a major extension to the hotel is being built
    - manual updates of customer records will become problematic
  - So they'd like continuous on-line updates of customer accounts from:
    - the hotel catering service (responsible for room service)
    - the pay-TV system (charge a customer as soon as she starts viewing a movie)
    - and the hotel restaurant (assume there is only one).

Analysis

→ What are the problems?

→ What are the alternatives?

→ What are the selection criteria?

→ What recommendation would you make?

Analysis

- What are the problems?
  - Loss of income because of inaccurate and untimely reporting;
  - Cost of feeding information into the checkout system;
  - Potential problems with business expansion.
- What are the 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
  - …
- What are the selection criteria?
  - Cost (development cost for new system vs operating cost for old system)
  - Customer convenience/satisfaction;
  - Reduction of losses due to unreported charges;
  - …
- What recommendation would you make?
  - ??

Computer Books by Mail (CPM)

→ Current situation

- Established 12 years ago, CPM'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
  - 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 currently running at about 100 invoices per day
  - each with average of 4 book titles and average value per invoice of $150.

→ CBM Corp. recently acquired by a holding corporation

- New management plans to expand the operation considerably:
  - improving service levels by holding stocks of the 100 most frequently ordered book titles
  - allow 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 means some new functions will be needed:
  - credit checking
  - an inventory control system of some sort.
  - rapid access to a catalog of books for phone sales staff to verify authors and titles and to be able to advise callers what books are available on any given topic.

Analysis

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- What are the alternatives?
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- What are the selection criteria?
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- What recommendation would you make?
  - ??