



## 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 (with some suggested answers)
- ↳ Computer Books by Mail (exercise for the reader)



## 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 a 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?

- ↳ 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 mean 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

→ What are the problems?



→ What are the alternatives?



→ What are the selection criteria?



→ What recommendation would you make?

