Cost-benefit analysis

- Cost-benefit analysis refers to a formal discipline used to help appraise, or assess, the case for a project or proposal.
- The process involves, explicitly or implicitly, weighing:
  - the total expected costs against
  - the total expected benefits of one or more actions
  - in order to choose the best or most profitable option.
- The formal process is often referred to as CBA, or Cost-Benefit analysis.
Usability & Cost-benefit

- What is “contextual” when it comes to cost-benefit analysis?
- Remember: Usability is related to:
  - a specific product
  - specified users
  - specified goals
  - specified context of use
- Usable IT-solutions in practice?
  - What does “in practice” mean when the context is cost-benefit analysis?

IT in Sweden

- >70% use IT daily.
- >35% use IT more than half day.
- In “administrative work” (25% of the labour) almost all use IT 100%.
- Approx. 35% of all work is performed with direct use of IT.

“Chaos” about IT development projects

- 30% of all projects are never finished
- 50% of all projects
  - cost 190% of planned budget
  - for 40% of planned functionality
- 20% are finished within time and budget
  - For large projects: 10%
  - For VERY large projects: 0%

(www.standishgroup.com, 1995)
Suggested success factors

- Elaborate analyses / different levels
- Involve users
- Well specified goals
- Stepwise development
- Do not change everything at the same time
- Hire HCI-specialists
- Focus on deployment

A new Chaos report, 2009

- 32 % completed on time and budget
- 44 % “challenged”
- 24 % total failures

Swedish research:
- All “failures” do the same mistake, and at the same time – at project start!

Rethinking benefit

- What is benefit in relation to usability?
  - Measurable, invisible, observable, short- or long-term?
- What is productivity in relation to usability?
  - Measurable, short- or long-term, custom relation, observable?
- What is cost in relation to usability?
  - Measurable, invisible, observable, short- or long-term?
The “Peng model”

A method for evaluating and controlling the benefit of IT in an organisation
- Has been applied a lot (in Sweden)
- Is it a good or bad method???

PENG

- Preparation
  1. Purpose – goal?
  2. Insight
  3. Specify object
  4. Describe object

- Performing
  5. Identify benefit effects
  6. Structure benefit effects
  7. Define values to effects
  8. Calculate costs for benefit

- Quality assurance
  9. Validation and risk analysis
  10. Calculate net benefit and specify responsibilities for reaching the goals

PENG evaluates benefits and costs
**PENG - example**

- A new system for patient administration – identify benefits...
- Saved working time 19 400 h/year
- ->Personnel costs = - 40.5 MSEK
- Saved document costs = - 2.5 MSEK
- Less tests = - 7 MSEK
- Benefit = 50 MSEK/year

**IT and cost-benefit**

Institutionen för informationsteknologi  
| Människa-datorinteraktion | http://www.it.uu.se/research/hci/ |

**PENG - example**

- E-recipe
- Stockholm county has analysed the benefit of introducing e-recipes.
- The benefits are high for those physicians who write the recipes.
- The Pharmacies can handle the recipes more efficiently.
- The patients can get their medicines faster, safer and with more flexibility.
- The total benefit is calculated to be 135 MSEK.
- Critique???

**IT and cost-benefit**

Institutionen för informationsteknologi  
| Människa-datorinteraktion | http://www.it.uu.se/research/hci/ |

**Cost vs. Benefit?**

**Receptstopp efter datorhaveri på Apoteket**

Apotheke AB:s butiker kunde inte lämna ut e-receptboblade lekmansdel under helgen. Även andra kedjor har haft datorbekymmer. På sändingen löses problemen previseriskt, men "det är stöktigt i många av butikerna", enligt Apoteket.

Problemets uppehåll på tänden och det är oklart hur snart det kan återupptas. Orsaken ligger hos Apotekets datorinfrastruktur.

"Det kommer väldigt snabbt för oss, sannerligen håller på att byta systemen in a köra apoteket" väger Apotekets varuhuvudinnehavare Eva Friman till DN. 

**IT and cost-benefit**

Institutionen för informationsteknologi  
| Människa-datorinteraktion | http://www.it.uu.se/research/hci/ |
Balanced Scorecard

The Balanced Scorecard (BSC)
- a performance management tool
- began as a concept for measuring whether the smaller-scale operational activities of a company are aligned with its larger-scale objectives in terms of vision and strategy.
- focusing not only on financial outcomes
- but also on the operational, marketing and developmental inputs to these, the Balanced Scorecard helps to provide a more comprehensive view of a business, which in turn helps organizations act in their best long-term interests.

Balanced Scorecard

Implementing Balanced Scorecards typically includes four processes:
1. Translating the vision into operational goals;
2. Communicating the vision and link it to individual performance;
3. Business planning;
4. Feedback and learning, and adjusting the strategy accordingly.

Balanced Scorecard
- is a framework, or what can be best characterized as a "strategic management system"
- claims to incorporate all quantitative and abstract measures of true importance to the enterprise.
- "The Balanced Scorecard provides managers with the instrumentation they need to navigate to future competitive success". (Kaplan and Norton)

Grouping of performance measures in general categories (perspectives)
- aids in the gathering and selection of the appropriate performance measures for the enterprise.

Four general perspectives have been proposed by the Balanced Scorecard:
- Financial Perspective
- Customer Perspective
- Internal process Perspective
- Innovation & Learning Perspective
Balanced score-cards

- Can be used for planning and evaluating introduction of IT and information systems in an organisation?
- Yes, this has been tried!
- Successful??

The productivity paradox

- The productivity paradox (the Solow paradox) is the theory that computers have contributed negligibly to productivity, often summarized as:
  - "You can see the computer age everywhere but in the productivity statistics."
- The "discrepancy between measures of investment in information technology and measures of output at the national level."
- It was widely believed that office automation was boosting labour productivity (or total factor productivity).
  - However, growth accounts didn’t seem to confirm the idea.

P-paradox

P-paradox

- Besides a great number of case studies, econometric analysis of data from ca. 400 big US companies points out that:
  - IT systems may improve the economic performance of companies, if and only if their implementation goes hand in hand with decentralisation, object-oriented reorganization of work and investment in human capital,
  - companies decentralizing their organizational structures achieve higher productivity in using IT systems than those who invest in IT only,
  - the expenses for organizational renewal and training are a multiple of the expenses for hard- and software, e.g. four times higher in case of implementing ERP (Enterprise resource planning – Affärssystem) systems.

When does IT give benefits?

- It is only when you reach organizational changes that IT contribute to positive changes. Don't "Pave Over Old Cow Paths".
- E.g.:
  - Decentralization, new work processes, new competencies, cooperation, communication, overview, local planning, follow up, evaluation, quality assurance ...
Assignment (No 5)

- Cost-benefit analysis, productivity and IT
- Write a paper about one specific aspect of the cost-benefit problem area. If possible, find a case to analyse. There are many cases described in reports, newspapers etc. The problem is that the reports available seldom (never) tell the whole truth.....

Assignment examples

- There are different aspects that can be studied
  1. The problem to define and specify benefits. There exist different methods for this.
     - One example: the PENG model
     - How can BSC be used?
  2. The productivity paradox – when can we reach benefits using IT?
     - Macro-level (national or sector level)
     - Micro-level (e.g one organisation)

Assignment examples

- There is a theory to check if it works
  1. Vanishing IT-productivity model
     - Different phases
     - Adoption, increased profits, new becomes standard, decreased prices, productivity disappears
     - Do this theory hold for all cases, all organizations?
     - What if it does? Is IT always a source for competition?
     - How does this affect analyses of usability and benefits?
Assignment report

- The report should reflect the work (one work week per group member)
- Write a proper scientific report (even if it is short)
- Background, problem, theory, method, activities, results, evaluation, discussion, references...
- Hand in electronically (e-mail)