Role of information and IT

Introduction to Service Science
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What is the information?

- In common language
  - Knowledge to be presented, content of the message, answer to a question
- In science
  - Data on the properties, setting and arrangement of the object
- In informatics
  - Coded data that can be sent, received, saved and processed by technical equipment

Economics view to information

- Till 60s of 20th century
    - Information are „perfect"
    - All parties have same access to the information
    - Information are public goods
    - Some authors mentioned marginal problem to access information (Smith, Marshall, Keynes)
- 1961 – George Stigler – Economics of information
    - Information is valuable source
    - First try to set the price mechanism

Economics of information

⇨ Perfect information
- ⇨ All participants of the game can see the cards of others as well as the undistributed cards in the package

⇨ Incomplete information
- ⇨ All participants have the same information, but no-one has information advantage
- ⇨ All participants can see cards of the others, but undistributed cards are hidden

⇨ Asymmetric information
- ⇨ All participants can see only their cards
- ⇨ Some information is private

Economics of information

▸ The game theory – one of the sources of analysis
▸ Imperfect information
  ▸ One player does not know the behavior of the others
▸ Incomplete information
  ▸ One or more players do not know one or more aspects of the game rules, necessary for their decisions

Stigler's model

- Seniors game
    - Where to buy a particular good for the cheapest price
- Assumptions
    - The buyer knows all shops, where he can buy this product
    - The buyer does not know the prices in the shops
    - The buyer is willing to invest some costs to find the information about the cheapest price
    - The amounts of those costs are limited
- What do we do now to solve this problem?

The searching costs

- The valuation of the time, needed for the finding of the information
- The costs for the searching must be same or less than expected profit
- Conclusions
  - The costs for the searching are individual
  - The reduction of the problem to the price difference is wrong
    - The value is also important
  - The analysis of the problem is too simple
  - IT rapidly decline the searching costs

Quality of information

- If you are buying some product or services, how you can be sure about its quality?
- Guarantee
    - Insurance for the product failure
    - Impulse for the producer to improve the quality
    - Has information value – indicator of the product quality
    - Direct influence to the producer reputation
    - Selecting (extended) guarantee can be used for the customer discrimination

Moral hazard

- a tendency to take undue risks because the costs are not borne by the party taking the risk
- The customer is able to affect an event he is insured against, but the seller has no power to monitor or affect this event.
  - Insurance company do not know how you use your car
  - ERP supplier has limited information about customers IT security
- Double moral hazard
  - Supplier gives only limited or minimal guarantee
  - Customers information about product quality is limited

The market of Lemons

- Author G. Akerlof
- Lemon = used car
- Main assumption
  - Every used car has hidden defect
  - If it would not have, the owner should use it instead of selling it
  - The owner of the good car is not motivated to sell the car
  - The quality of used cars on the market is very low

Conclusion for Lemons market

▶ The price for the comparable cars will be the same

▶ The buyer has limited possibilities to recognize the real quality of the car

▶ If the quality of offered cars would drop under level of the price, the market would be empty

Auctions models

- Situations
  - Monopolist sells a special kind of product or good (art)
    - Not able to estimate the value for the buyer
    - To declare a price
      - Someone is willing to pay more
  - Monopson buys a special kind of the service
    - Not able to estimate the real costs
    - To declare a price
      - Someone is willing to deliver the service cheaper
- Solution
  - Move the asymmetry to the other part of market

Types of auctions

- With common value of the product
    - Each participant has his own value of the product
    - Participant do not know the valuation of each other
- With independent private value of the product
    - There is only one objective value of the product
    - Nobody knows it

Auctions with independent value

- English auction
  - The price grows according to the orders
  - The highest price wins
- Dutch auction
  - The price is set on the highest lever
  - The price is reduced
  - The first call wins

Auctions with independent value

▶ Closed auctions
- ▶ The offers are given before
▶ the first price auction
- ▶ The highest or the lowest price wins
▶ The second price auction
- ▶ The highest and lowest offer are excluded
- ▶ The second highest or lowest offer wins

Information gap

▣ Subjects on the opposite sides of the market have a different information about the subject of exchange

▣ Seller has better information about the car

▣ The insurance company must trust in its clients responsibility

▣ Information gap is the difference between two subjects on the market

▣ Is positive – if the subject knows the information

▣ Is negative – if the subject does not know the information

Information gap

▶Moral hazard – effect when the activity of one subject decreases the utility of the second subject concurrently with information gap on side of the second subject
▶Information gap is not stable
▶Examples
  ▶Try to find an example of the information gap you have met

How to fit information gap?

▶ Filling the gap
  ▶ By distribution of the information?
  ▶ Removal of subject's disadvantage, based on nascence of particular information
▶ Subject must be willing to invest to filling of the gap
▶ The first condition is to identify the gap
▶ The filling is the function of time
▶ Questions
  ▶ How will the subject fill the gap?
  ▶ Can the gap be filled by itself?

Filling the information gap

- Absolute
  - The information are distributed from one side to the other
  - Example
    - Register of insured persons
      - To know a history of new client
    - Register of debtors
      - To eliminate to risky clients
- Subjects facing negative gaps can join even if they are competitors

Filling the information gap

- Relative
  - If there is no way how to get the information
  - Example
    - Bankrupt of travel agency
      - The client has no power nor possibility to find the information
    - Mandatory insurance of travel agency
      - The client does not need to take care about travel agency finance
    - Mandatory car insurance
  - Relative filling is the eliminating of the gap's influence

More general attitude to information gaps

- Direct methods of filling
  - If the aim is particular information gap
- Indirect
  - The aim is more general
    - To prevent the creation of information gap
    - To solve whole problem

Indirect method to fill the gaps

- Source of information
    - Subject that provide the knowledge or information
    - The way of transfer of the information
    - Primary source
        - Author of information
        - No changes on the character of information
    - Secondary source
        - Information is transformed
- Information channel
    - If more sources of information join to use the same way of transfer

Role of IT

- IT is a tool to:
    - fill the gap – to distribute information
    - To eliminate the gap – using IT services to interconnect subject with negative effects of a gap
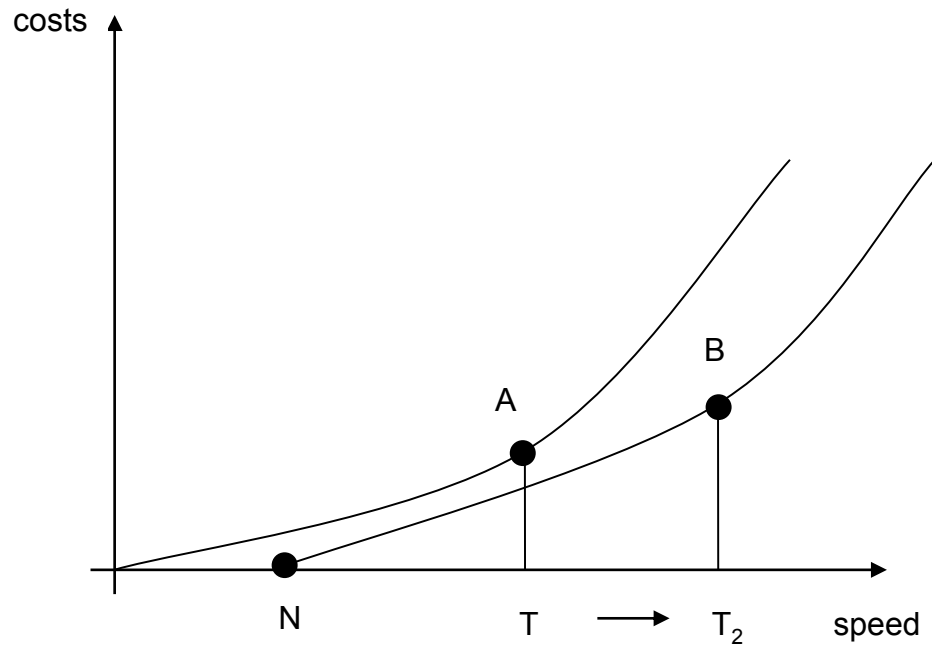   - Manage the information
        - To prevent the influence of the gaps
        - To eliminate the gaps

The price of information

▣ Is almost individual
▣ It is equal to the searching (opportunity) costs
▣ It is important to divide the price of information and the price of access to information
　　▣ To buy the possibility to search
　　▣ To buy a possibility to share information
　　▣ The question of technology
　　▣ Higher speed means higher probability to find what I am looking for

Technology progress

Government and information

- It needs the information for making of the decisions
- It is important source of information
- It is supervisor on the market with information

Government as the information receiver

- The most of analysis is done by
  - state institutions
  - ministry clerks
  - National bank
- The government is the source of information for itself
  - The analysis can be wrong
  - The decisions can be wrong – moral hazard
  - The question of time

The government and searching of information

- Where is the equilibrium of searching
- Stigler model does not work
    - The process of searching is excluded from the process of evaluating and using of the information
    - The person who is searching does not know the effect
- We can not be sure that the government has right information
- We can not be sure the information are correct
    - Moral hazard
    - The Greece

The government as the source of information

- The government is not one source of information
- The motivation of the clerks
  - To publish only the information that are good for them
  - Moral hazard
- The subjects need the information from other source to prove it

The government regulates the market of information

- Direct approach
  - Problem of the identification of information gap
  - Absolute filling
    - How to do it
    - Law – market subject must give some information to the register
  - Relative filling
    - Not necessary to identify a specific problem, just a group of problems
    - Mandatory insurance

The government regulates the market of information

- Indirect approach
  - Development of information sources and channels
  - Support of using services
    - Data mail-boxes
    - Digital signature
    - E-government
  - Supporting the development of the information access