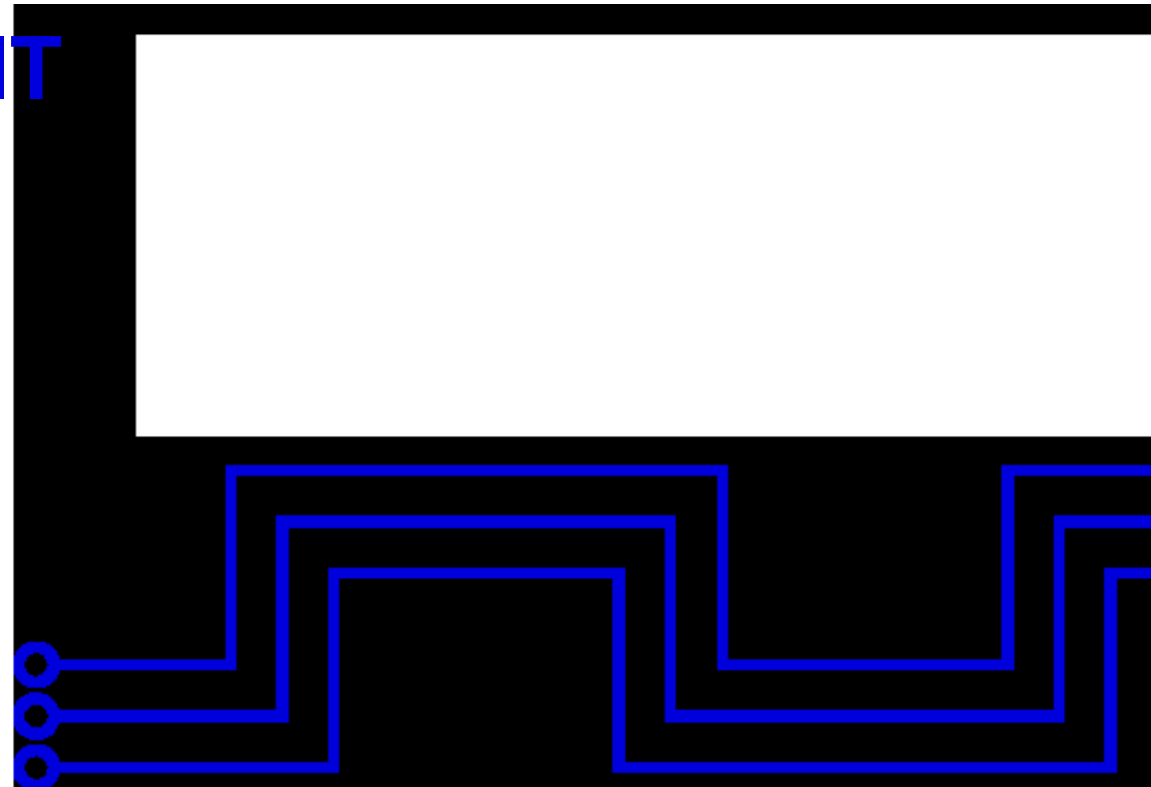


# Role of information and IT

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

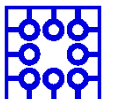
- All participants of the game can see the cards of others as well as the undistributed cards in the package

### 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



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?



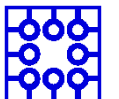
# The searching costs

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

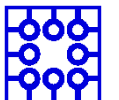
## The market of Lemons

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

## Solutions of Lemons market

The way how to deal is to create informed customer

If customer knows how to distinguish the quality, he will be able to make a business

There is still place for selling „lemons“ to less informed customers

# Auctions models

A holder sells a special kind of product or good (art)

- Not able to estimate the value for the buyer to declare a price
- Someone can be willing to pay more

A customer buys a unique 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 evaluation of the product
- Participants do not know the valuation of others

### With independent private value of the product

- There is only one objective value of the product
- Nobody knows it

## Auctions with common 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

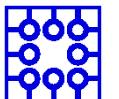
### Relative

- 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
- Solution is 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



## 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

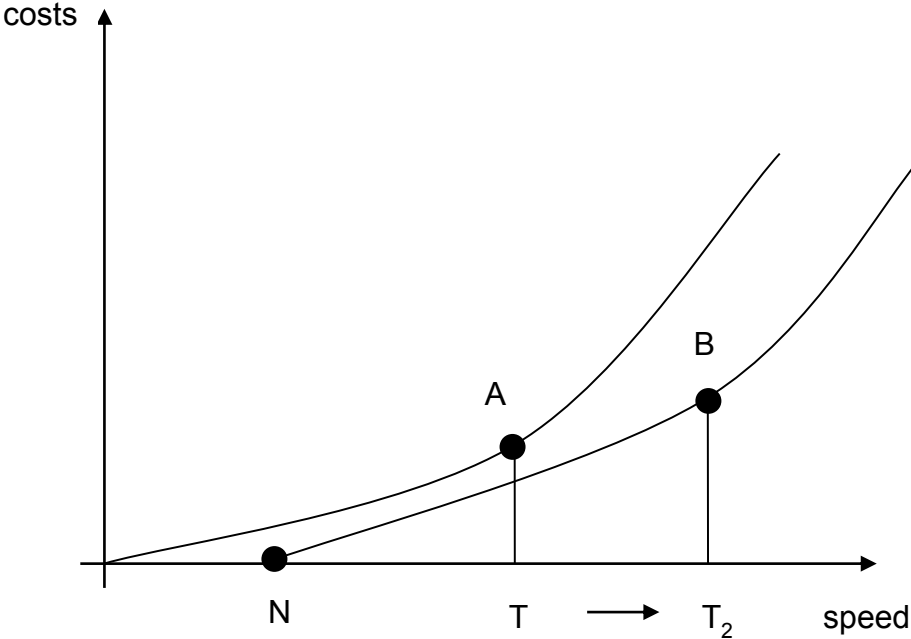
### To buy the possibility to search

### 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

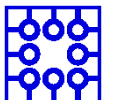


## Government and information

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
- Just compare how the governments are reaction on COVI19 pandemic

## 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 influence

- 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

Development of information sources and channels

Support of using services

- Data mail-boxes
- Digital signature
- E-government

Supporting the development of the information access

