

The logo for UNIL, featuring the word 'Unil' in a white, cursive script font.

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# Comparison of Multicriteria and Prediction Market Approaches for Technology Foresight

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# Introduction

One of the critical issues in IT management is to **“situate the challenges facing the IT managers regarding emerging technology...”**.

McKeen and Smith (2003)

This requires companies to adopt a systematic process to stay up-to-date and assess new technology for a potential integration into modern organizations.

# How to choose the best approach?

We propose to establish a comparison framework based on characteristics derived from past research previously presented (MCDM and PM).

- **Presentation of the Approaches**
- **Design of the Artifacts**
- **Settings of the Experiments**
- **Analysis of the Results**

This framework aims at helping us to compare our two approaches and identify their key success factors.

- **Comparison of the Methods**
- **Conclusions**
- **Future Work**

# Presentation of the Approaches

## MCDM

### A Management Science Approach

- uses either quantitative or qualitative criteria simultaneously and concurrently
- determines the solution approaching the “optimal” in regards of several criteria or among existing solutions

## PM

### An Emerging Approach

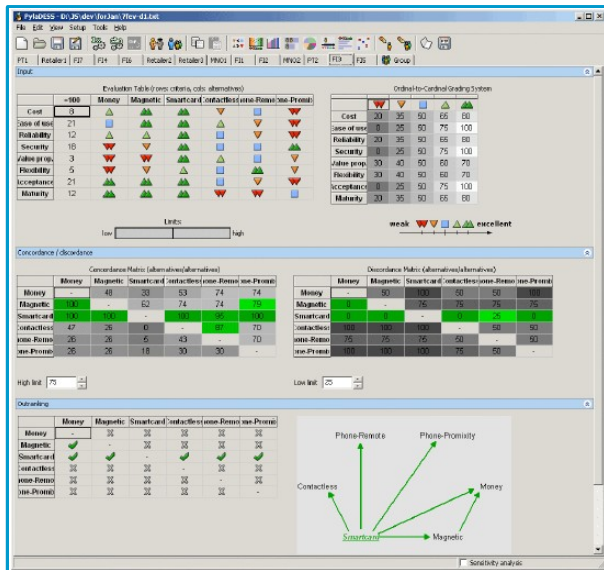
- aggregates automatically the information disseminated among all actors in a corporate crowd
- determines the consensual equilibrium price of the underlying solution

# Design of the Artifacts

## MCDM

### A Group Decision Support System

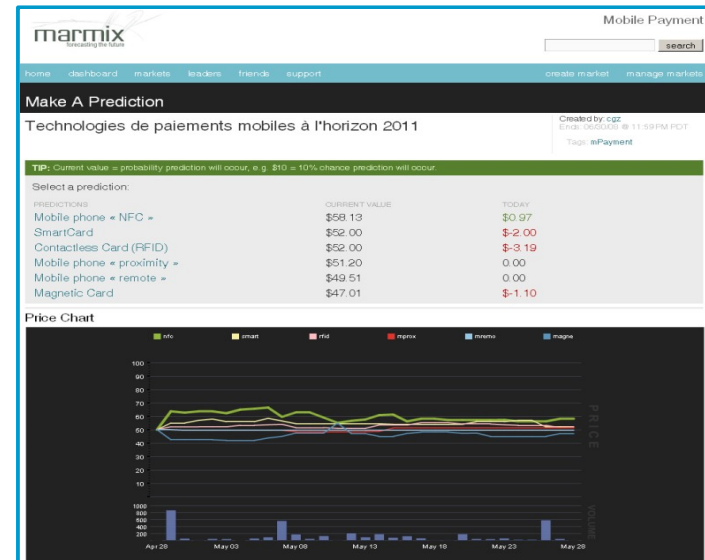
#### PylaDESS



## PM

### e-Trading Market

#### MarMix



# Settings of the Experiments

## MCDM

### Visiting Swiss Experts

## PM

### Gathering the Crowd

Selected Experts

**Who**

Master Students (crowd)

Individual interviews with each company followed by a roundtable for all the experts to meet and discuss the results.

**Where**

One group meeting to start the market and some trading activities. Later, the participants continue to trade alone anytime.

6 month

**When**

1 month

Several month for setup, interviews and analysis

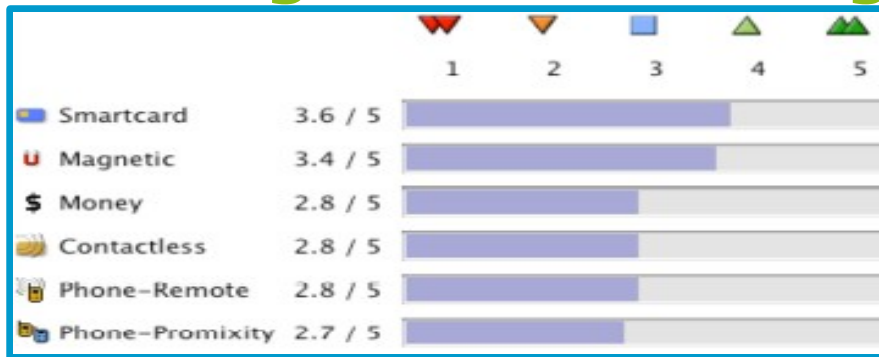
**How**

Few days for setup and analysis

# Analysis of the Results

## MCDM

### Ranking and Outranking



1. SmartCard

2. NFC

3. Contactless Card

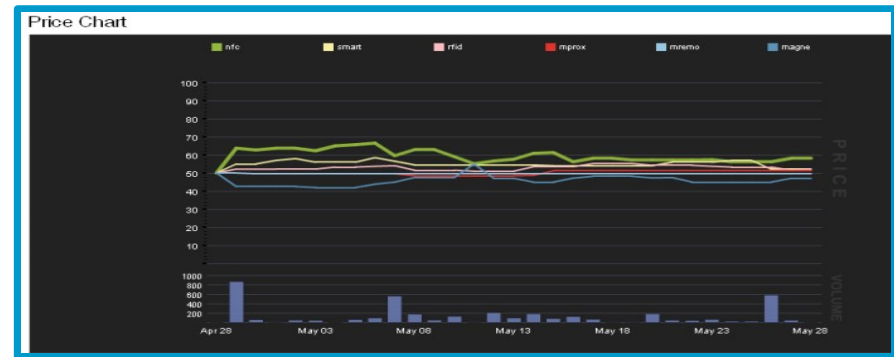
4. Magnetic Card

5. Phone proximity

6. Phone remote

## PM

### Price of Contracts



1. NFC

2. SmartCard

3. Contactless Card

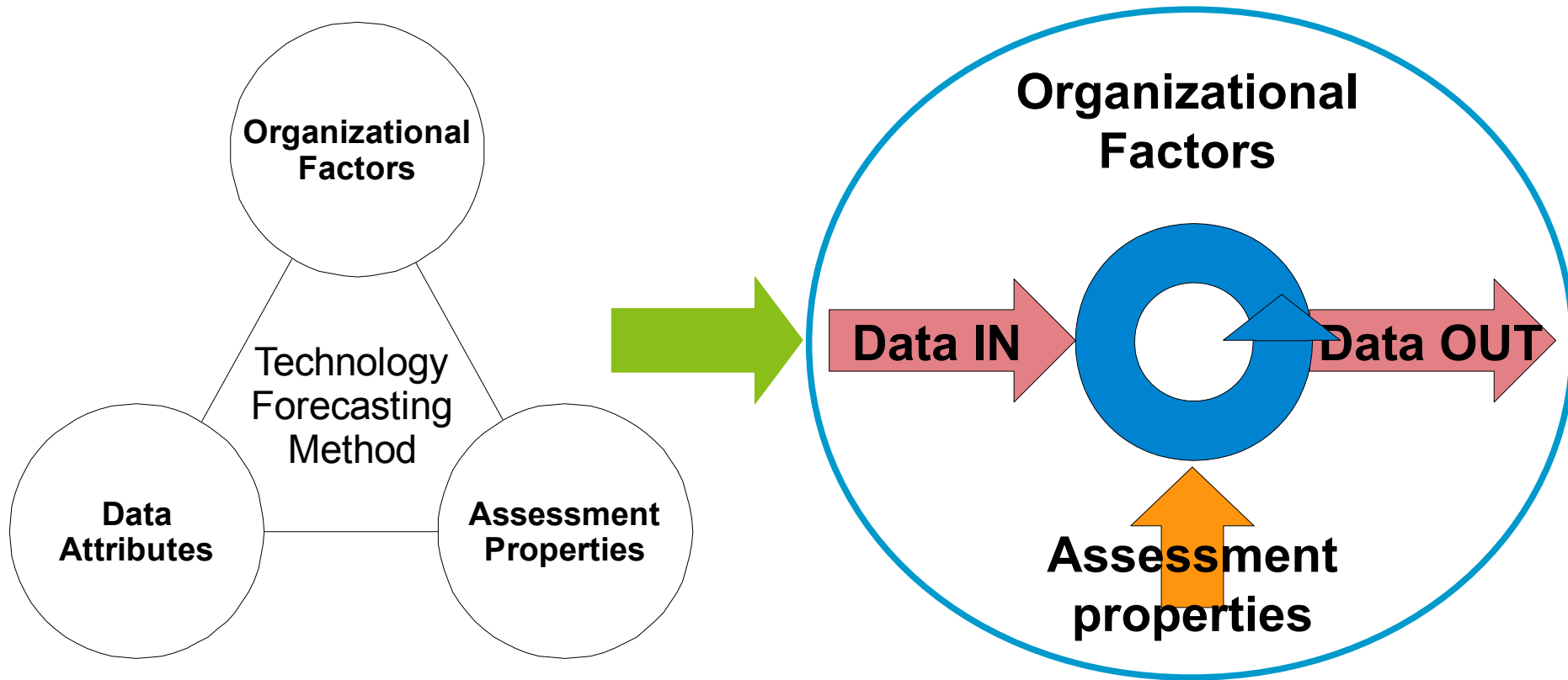
4. Phone proximity

5. Phone remote

6. Magnetic Card

# Comparison of the Methods (1/5)

## A Framework of Comparison





# Comparison of the Methods (2/5)

## Organizational factors

### MCDM

- organizations with formal and less participatory decision-making processes
- relies mainly on relevant experts
- experts need a good knowledge of the method

### PM

- organizations with participatory and informal decision-making style
- community of players driven by the game and its financial profits
- does not require in depth knowledge of the method

# Comparison of the Methods (3/5)

## Assessment Properties

### MCDM

- gives a posteriori results to support the resolution of a decision problem
- detailed snapshots taken at certain times

### PM

- longitudinal studies for assessments requiring frequent or permanent update
- movies shot over a period of time

# Comparison of the Methods (4/5)

## Data Attributes

### MCDM

- Endogenous Data Collection
- External Validation Process
- Extended Outcome

### PM

- Exogenous Data Collection
- Internal Validation Process
- Aggregated Outcome

# Comparison of the Methods (5/5)

## Key Success Factors

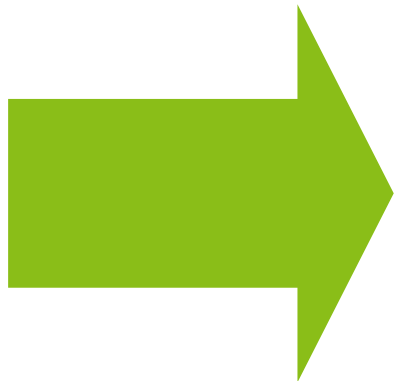
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- Experts vs Crowd
- Hired Facilitator vs Motivated Crowd
- Valid Data vs Validated Data
- Explicit Outcome vs Implicit Outcome

# Conclusions

**MCDM** approach brought an analytic explanation of the phenomenon by a controlled and criteria-based evaluation

**PM** provide a synthetic aggregation of numerous individual beliefs, constantly adjusted and made available for everyone



The combined strengths of the MCDM approach and prediction markets could be exploited for technology assessment and foresight to improve IT investment decisions.

# Future Work

- Expand the framework to a tool to choose the right Computer Aided Technology Foresight Tool based on the forecasting context
- Use our framework with other forecasting methods

The research presented in this slideshow is available as a research paper on the website of the author:

<http://www.hec.unil.ch/cgaspoz/en/publications.html>



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Cédric Gaspoz's research focuses on information aggregation, primarily to support decision making. He explores ways of aggregating disseminated information to structure it and increase its significance. His research covers a broad range of topics like prediction markets, group decision support systems (GDSS), negotiation support systems (NSS), semantic search and Mashup. His actual focus is on using prediction markets to support portfolio management of research projects in mobile information and communication systems.