prediction markets
supporting technology assessment
Discussion and conclusion

Instantiation and evaluation

Artifact specification

Justificatory knowledge

Research methodology

Literature review/background

Introduction
“We will never make a 32-bit operating system.”

Bill Gates
Microsoft Founder, 1983
“There is not the slightest indication that nuclear energy will ever be obtainable.”

Albert Einstein
Physicist, 1932
“An amazing invention – but who would ever want to use one?”

Rutherford B. Hayes
President of the USA, 1876
“Prediction is very difficult, especially about the future.”

Niels Bohr

Physicist, 1952
SOLUTION?

PREDICTION MARKETS
PREDICTION MARKETS are speculative markets created for the purpose of making predictions. Assets are created whose final cash value is tied to a particular event or parameter. The current market prices can then be interpreted as predictions of the probability of the event or the expected value of the parameter.
Exchange
Contract
Who will win the 2009-2010 UEFA Champions League?

What do you think?

Current leading prediction:
There is a 39.3% chance "Barcelona" will be the answer.

$1.20 today

The 2009-2010 Champions League will soon be down to 16 teams. Who will win this season's competition? The market will remain open through the last two match-days in the group stage, and then close...
DESCRIPTION

"In the future, Jake, a paraplegic war veteran is brought to another planet, Pandora, which is inhabited by the Na'vi, a humanoid race with their own language and culture. Those from Earth find themselves at odds with each other and the local culture." The secretive Project 880 is a retooled version of James Cameron's long-dormant Avatar, which was going to be the first feature film using a cast of CGI actors. Technology has finally caught up for Cameron to realize his dream.
Crowd is able to better assess the outcome of future events than individuals or a group of experts.
SOLUTION?

CROWDSOURCING
CROWDSOURCING is the act of taking a job traditionally performed by a designated employee and outsourcing it to an undefined, generally large group of people.
CROWD is able to successfully extend the enterprise boundaries to develop innovative solutions.
Design, build and evaluate prediction markets to support organizations in solving technological forecasting issues.
Efficiency
Introduction

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Literature review/background

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Artifact specification

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Instantiation and evaluation

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Discussion and conclusion

6
In competitive markets the information scattered among all participants is efficiently aggregated in the price function.

Friedrich Hayek
In an efficient market, each new available piece of information is instantly incorporated in the price of a security

Eugene Fama
Built on these hypotheses, prediction markets use the same concepts to predict the outcome of uncertain future events. The securities are linked to future events, and the value of the securities represents the aggregated expectation of the traders regarding the outcome of the event.
Information is unequally dispersed

Great diversity of traders motivated to share information

There is enough liquidity to reach an equilibrium price
Efficient in case of low liquidity or small markets

Safe from manipulations and traders' bias

Drive efficiency, freedom, flexibility and motivation
Public applications

Prices are accurate and respond quickly to news

Prediction markets surpass experts' predictions
Corporate applications

SIEMENS  project management

Google  strategic project evaluation

GE  sales forecasting

HP  new product development
Corporate applications

Scalability, flexibility, incentive to reveal the truth

Information markets are very efficient in supporting ideation process

Prediction markets are more efficient than traditional methods for solving business issues
Open questions

Design
DSRM

- Identify problem & motivate
- Define objectives of a solution
- Design & development
- Demonstration
- Evaluation
- Communication

Process iteration
Design as an artifact

Several artifacts produced

Multiple instantiations
Problem relevance

- Revealed by practitioners
- Confirmed by literature
Design evaluation

Field study

Descriptive evaluation

Benchmarking
Research contributions

- Design artifact
- Foundations
- Design methodology
Research rigor

Extensive literature review

Peer-review
Design as a search process

Iterative process

Multiple refinements
Communication of research

- Academic audience
- Practitioners audience
prediction markets
requirement engineering
economics decision support systems
technology foresight
R&D management
design-science management
information systems
Meta requirements

Electronic market supporting the crowdsourcing of technology foresight activities
Components

user account management
portfolio management
claims management
performance measurement

Principles of form and function

TRADER
Principles of form and function
Consideration of artifact mutability

Multiple instantiations

Design factors

Lack of mutability rules
Principles of Implementation

Roadmap
Principles of implementation

Organizational factors

Technology forecasting method

Data attributes

Assessment properties

Comparison framework
Testable design propositions

5 design propositions

claim formulation

IPO mechanism

simplified interface

group/individual sessions

market maker
Testable design propositions

30 design factors
Collective intelligence
Usage

it's complicated
Context

APTITUDE

ADEQUACY

SUITABLE FOR

Training
Napping
Eating
Driving
Sports
Whatever
Evaluation
Findings

1. 5 design propositions
   - Claims formulation
   - IPO process
   - Simplified interface

2. Suitable for complex claims
R&D portfolio management
Usage

Maximizing the value of the portfolio

Achieving a balanced portfolio

Building strategy into the portfolio
Context

Selecting the right criteria

Collecting the data

Negotiating the value
Evaluation

- Selecting the right criteria
- Collecting the data
- Negotiating the portfolio
- New product development
- Ideation process
- Group decisioning
Findings

1. A proposal
   - Design factors
   - Claims formulation
   - Traders motivation

2. A roadmap
Technology foresight
Usage
Context

MCDM

Prediction market

Magnetic card
SmartCard
Contactless card (RFID)
Mobile phone “remote”
Mobile phone “proximity”
Mobile phone “NFC”
<table>
<thead>
<tr>
<th></th>
<th>MCDM</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Who</strong></td>
<td>Selected experts</td>
<td>Students (crowd)</td>
</tr>
<tr>
<td><strong>Where</strong></td>
<td>One or two individual interviews with each company.</td>
<td>One group meeting to start the market and some trading activities.</td>
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<tr>
<td></td>
<td>One round-table for all the experts to meet, discuss the results and evaluate NFC</td>
<td>Later, the participants continue to trade alone anytime and anywhere.</td>
</tr>
<tr>
<td><strong>When</strong></td>
<td>Nov. 05 to May 06 + Oct. 06</td>
<td>May 08 (1 month)</td>
</tr>
<tr>
<td><strong>How</strong></td>
<td>Several months for setup, trips, phone calls, analysis</td>
<td>A few days for setup and analysis</td>
</tr>
</tbody>
</table>
Findings

1 comparison framework

- Organizational factors
- Technology forecasting method
- Data attributes
- Assessment properties

2 efficiency
Research question

Design
Research question

Adequacy
Limitations

Lack a real-life evaluation of our R&D portfolio management methodology

No empirical understanding of traders motivation
Further work

Real-life experiment to support R&D portfolio management

Compare more technology foresight methods
Design of applications
Claims generation
Motivation
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“The best way to predict the future is to create it.”

Peter Drucker
Economist, 1942