

Cluster 4 Comparison of Multi-criteria and Prediction Market Approaches for Technology Foresight

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1 > Introduction

Our research presents and compares two original approaches for technology assessment and foresight based on opposite paradigm: a management science approach (Multi-Criteria Decision-Making) versus a Web 2.0 approach (Prediction Market). In order to explore the relevance of the research, we

conducted several experiments in real environments. The results demonstrated that the rigor of management science and the participation of the Web 2.0 approach are complementary strengths for technology foresight. Furthermore, a framework has been established to compare the two approaches.



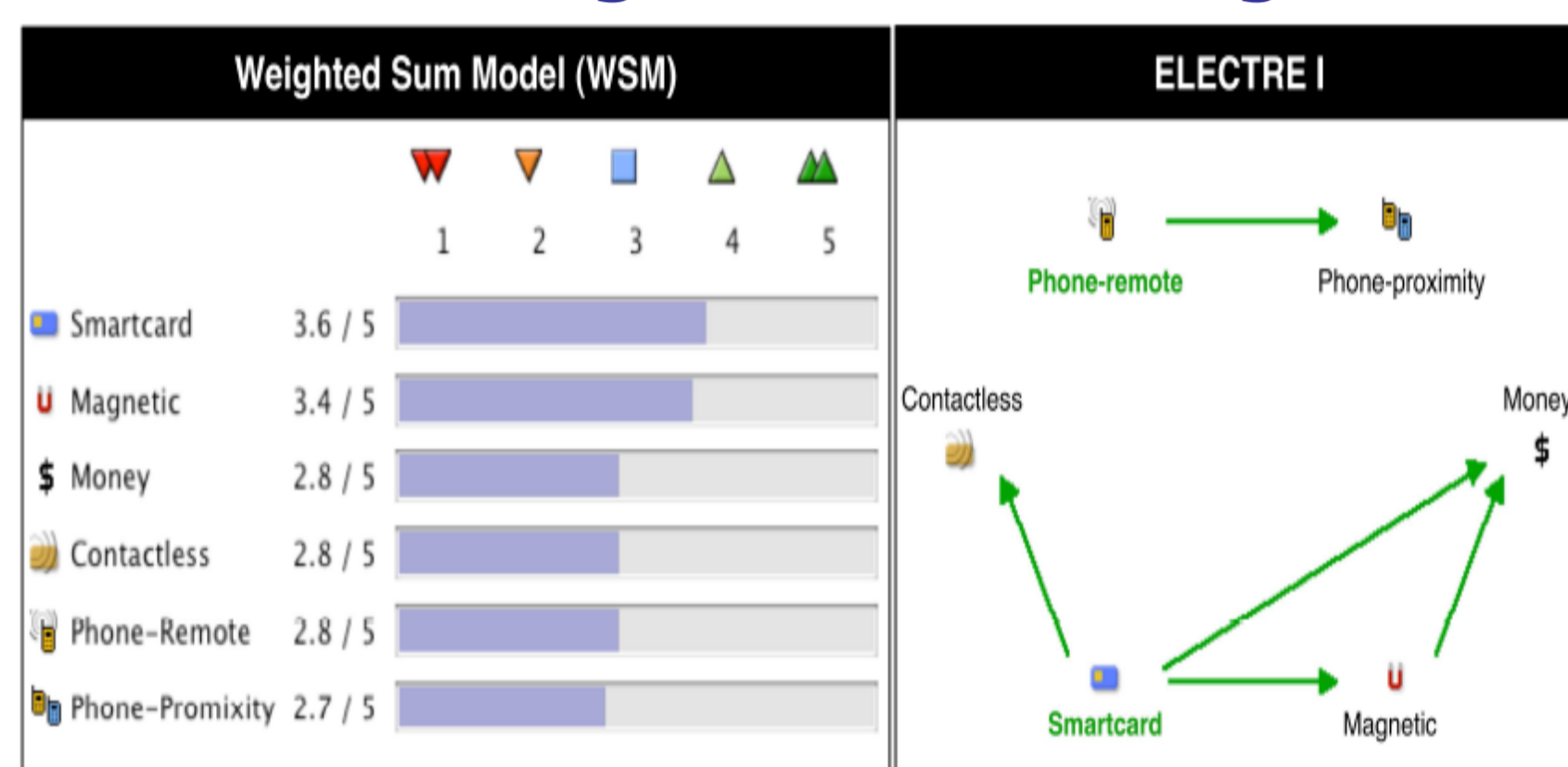
2 > Settings of the Experiments

To explore our approaches for technology foresight, we applied them in the field of mobile payments. Based on previous research (Ondrus and Pigneur 2007), we selected several possible alternatives for future technology developments in the Swiss mobile payments market.

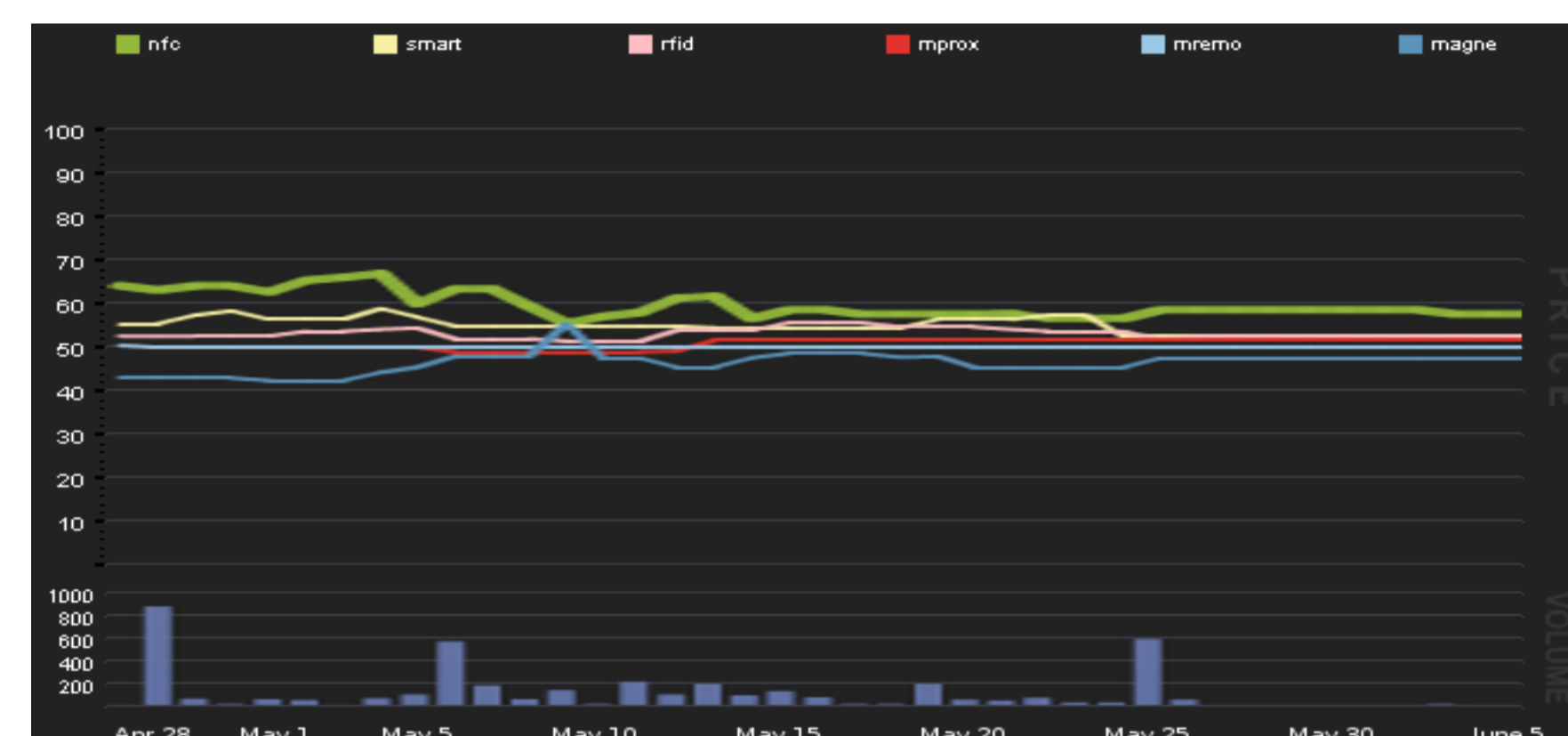
	MCDM > Visiting Swiss Experts	PM > Gathering the Crowd
Who	Selected experts	Students (Crowd)
Where	One or two individual interviews with each company. + One roundtable for all the experts to meet, discuss the results and evaluate NFC	One group meeting to start the market and some trading activities. Later, The participants continue to trade alone anytime and anywhere.
When	Nov. 05 – May 06 + Oct. 06	May 08 (1 month)
How	Several months for setup, trips, phone calls, analysis	Few days for setup and analysis

3 > Analysis of the Results

MCDM: Ranking and Outranking



Prediction Market: Price of Contracts



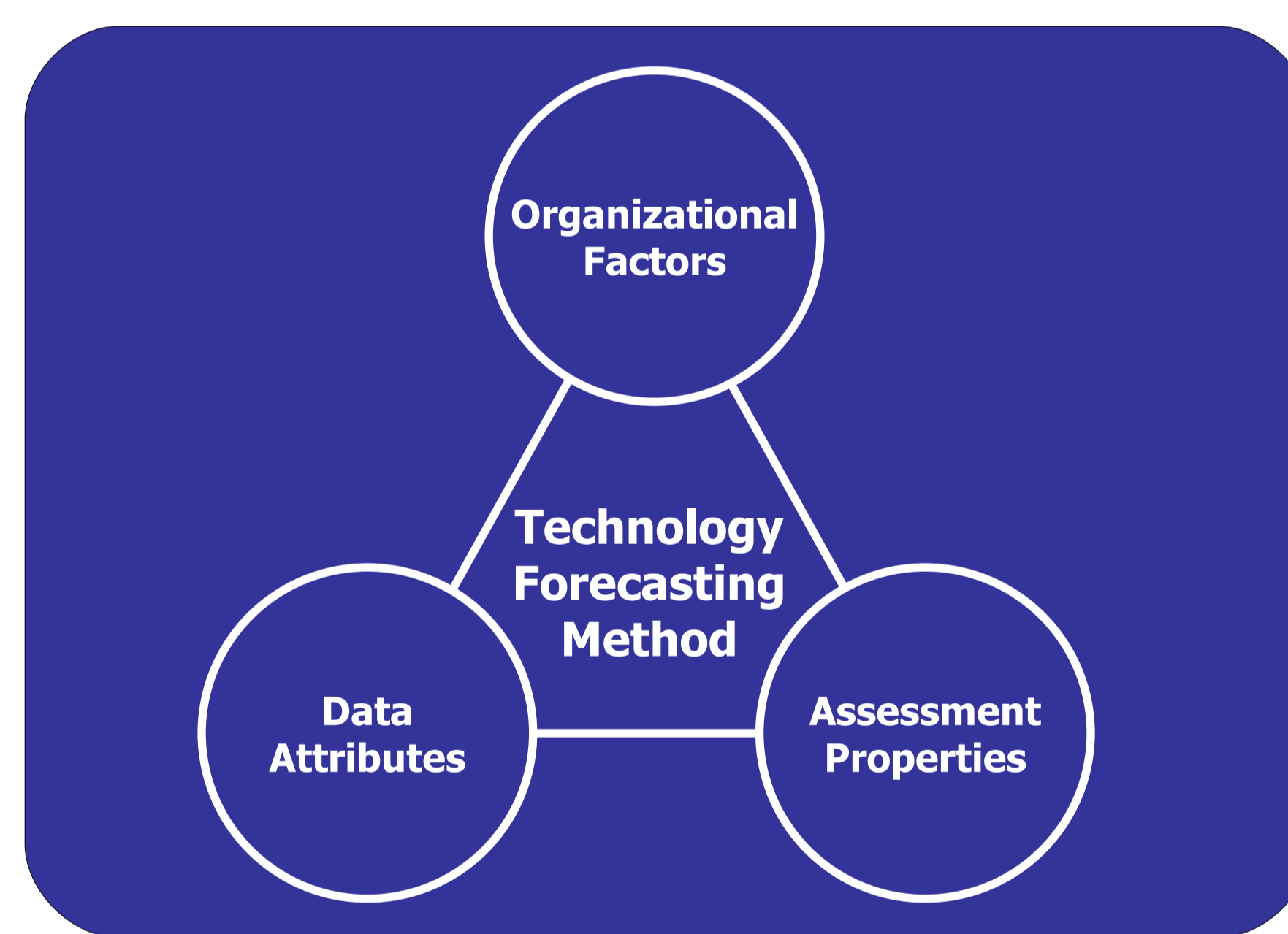
Comparison of the Results

MCDM	PM
1. SmartCard (3.8/5)	1. NFC (57.16%)
2. NFC (3.6/5)	2. SmartCard (52%)
3. Contactless Card (3.6/5)	3. Contactless Card (52%)
4. Magnetic (3.3/5)	4. Phone proximity (51.20%)
5. Phone proximity (2.7/5)	5. Phone remote (49.51%)
6. Phone remote (2.7/5)	6. Magnetic Card (47.01%)

4 > Comparison of the two Approaches

To compare our two approaches, we derived a framework based on the contingency factors developed by Lichtenthaler (2005) and the individual factors affecting technological forecasting from Levary and Han (1995)

The resulting framework contains three main components: the **organizational factors**, the **assessment properties**, and the **data attributes**.



	MCDM	PM
organizational factors	decision-making style	formal
	resources needed	informal, participative
	familiarity with the method	mid to high
		low
assessment properties	uncertainty	mid to high (in conjunction with other methods)
	time horizon	mid / (long)
	type of results	short to long
		static
		dynamic
data attributes	availability	via proxies
	origin	experts
		crowd

5 > Key Success Factors

To setup an MCDM analysis, a **facilitator should be hired** to meet each expert individually. Face-to-face meetings are essential to share the results. Prediction markets only need a **facilitator who can setup a claim on the platform**. Then, traders can play anytime and anywhere using a web browser. The challenge is to gather a motivated crowd, which trades regularly.

The efforts required for the MCDM approach are rewarded with **insurance that the set of data collected is valid** since the facilitator supervises the whole process. To overcome this issue in prediction markets, the **crowd automatically regulates the market**. Even if a trader introduces a bias in the market, the crowd would neutralize him/her by doing opposite actions.

MCDM methods are used when experts need to have a **precise explanation** of the phenomenon. The criteria, weights, and evaluations are useful indicators for unveiling possible weak signals. Prediction markets' outcome is by nature a consensus. The aggregated results provide a **simple but powerful indication** of the probability that an event would occur.

Levary, R. R. and Han, D. (1995) "Choosing a Technological Forecasting Method", *Industrial Management*, (37:1), pp. 14-18.

Lichtenthaler, E. (2005) "The choice of technology intelligence methods in multinationals: towards a contingency approach", *International Journal of Technology Management*, (32:3-4), pp. 388-407.

Ondrus, J. and Pigneur, Y. (2007) "Cross-industry preferences for mobile payments development in Switzerland," *Electronic Markets*, (17:2), 2007, pp. 142-152.

