1ST INTERNATIONAL WORKSHOP ON THE INTERNET FOR FINANCIAL COLLECTIVE AWARENESS & INTELLIGENCE (IFIN 2016)

In conjunction with the 3rd International Conference on Internet Science (INSCI 2016)

12 September, Florence, Italy

REPORT

Organized by the PROFIT Project

(http://projectprofit.eu/)

Table of Contents

Executive Summary

The 1st International Workshop on the Internet for Financial Collective Awareness & Intelligence (IFIN 2016) was held at Florence, Italy, in conjunction with the 3rd International Conference on Internet Science (INSCI 2016), on Monday 12th September, and lasted from 13:00 to 19:00. It was organized by the recently initiated CAPS Project "PROFIT: Promoting Financial Awareness and Stability", which has received funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under grant agreement no 687895.

The IFIN Workshop was aimed at initiating a multidisciplinary dialogue on how we can use the Internet in order to promote financial awareness and capability among citizens. It consisted of two parts:

- Presentation of related work
- Roundtable interactive discussion with all participants

Under the first part, key ideas from the PROFIT project were presented and discussed. Moreover, contributions from the wider scientific community focused on the particular field, were also presented, upon acceptance through an open call for papers. Under the second part, an interactive discussion with the audience in a roundtable fashion being led by experts was initiated. The audience was encouraged to discuss their ideas and views on the purposes and services an online financial awareness platform should have and how would such a platform cater to their needs. Furthermore, issues such as anonymity and privacy that would arise using that platform were also discussed.

The 22 participants of the workshop came from a highly multidisciplinary background; they consisted of experts and professionals as well as academics and researchers in the financial sector and economics, computer science and IT, social sciences, etc. The audience also varied greatly in age, comprising young researchers/professionals in their late 20s, as well as more mature participants.

The particular workshop helped initiating a fruitful and interdisciplinary discussion on various issues, including the state of financial literacy among EU citizens, the use of the Internet and Web 2.0 tools for promoting financial literacy, the PROFIT financial awareness platform functionalities and services, the use of semantic web technologies for advanced analysis of financial news corpora, etc.

Introduction - Background

The main purpose of IFIN was to open a multidisciplinary dialogue on how we could use the Internet to promote financial awareness and capability among citizens. More specifically, the new socio-economic landscape that has prevailed in the post-crisis world brought changes in the financial, labor and pension markets along with changes in the public finance decisions and the political sphere. However, the volume of information coming from the web, the existence of often ad hoc sources, the documented existence of cognitive limitations by individuals when it comes to the processing of large volumes of information, and the documented widespread financial illiteracy even within developed economies, including those of the European Union, all identify the need for appropriate methods and tools to extract and process such information, create new knowledge and present to the users.

In this context, IFIN 2016 aimed at presenting the most recent works in the area of financial collective awareness and intelligence based on web resources and social media with an emphasis on user generated content. IFIN encouraged the submission of papers relevant to the retrieval, analysis, aggregation, and presentation of financial data from the Internet and social media (including user generated content), focused on forecasting models exploiting the market sentiment to identify market trends and threats, on financial literacy assessment and education tools, as well as on personalized services and decision support financial applications.

Research topics of interest for this workshop included, but were not limited to:

- Financial web data retrieval, analysis and presentation
- Financial forecasting models based on web data
- Financial literacy assessment & education web tools
- Financial awareness technological platforms

As already mentioned, IFIN 2016 was organized by the EU-funded project called PROFIT: Promoting Financial Awareness and Stability, which aims to develop a web platform towards promoting financial awareness and improving the financial capability of citizens and other market participants. The objectives of the platform would be: (a) to raise financial awareness and support better decision making, (b) to create collective financial intelligence, and (c) to empower use participation and interaction. This platform will be designed and pilot-tested with the aid of the members and partners of the European Federation of Ethical and Alternative Banks (FEBEA), an institution committed to the responsible banking and finance agenda in Europe.

Built on open source components, the PROFIT Platform will incorporate the following functionalities:

- Financial Education, providing specialized & personalized financial educational toolkits available to the wider public.
- Crowdsourcing tools, such as advanced crowdsourcing tools to process financial data, extract & present collective knowledge.
- Recommendation systems, in particular a novel personalized recommendation system catering to particular users' needs & interests.

- Forecasting models, such as advanced forecasting models exploiting the market sentiment to identify market trends & threats.

It should also be mentioned that the PROFIT community consists of:

- The Core Consortium: 6 core members and 6 associated members bringing different expertise across accounting and finance, economics, education, information technology, and computer/software engineering.
- The User Forum Members: relevant PROFIT stakeholders and experts that provide the project with their valuable feedback and advice.
- The Affiliate PROFIT Community: the wider community around the project, formed by related projects, research activities and stakeholders (future users of the PROFIT platform).

Presentations

The participants were first welcomed by Dr. Anna Satsiou from CERTH who made a short introduction to the PROFIT project and the IFIN workshop. The agenda of the workshop included a keynote speech by professor Steve Schifferes titled *"The Web & and the Challenge of Financial Literacy"*, as well as several other presentations on various topics.

Professor Steve Schifferes is currently Director of the Financial Journalism MA at City University London, and has a wide-ranging background in business and finance journalism, both for television and online. He has been economics correspondent for BBC News Online, coordinating coverage of the credit crunch, the Asian financial crisis, the Enron scandal, and the launch of the euro. He reported from the USA during the sub-prime crisis, the Iraq war and the Obama election and from Bangalore, Shanghai and Detroit on globalization and its discontents. Previously, he was a television producer for programmes including "On the Record", the "Money Programme" (BBC), and "Weekend World" (LWT), as well as a documentary film maker (Breadline Britain, Fortune, and The Making of Modern London for LWT).

Professor Schifferes has lectured around the world on the role of the media in the financial crisis, including Tsinghua and Fudan Universities (China); Mumbai University (India); Columbia and North Carolina (USA); Helsinki (Finland) and Cologne (Germany). He has also done training and consultancy for the International Labour Organisation in Turin, for BBC News, and for the Oxford Internet Institute summer school at Harvard. Professor Schifferes was a BBC Reuters Fellow at Oxford University in 2006, and a Knight-Bagehot Fellow at Columbia School of Journalism in 1993-4. He was educated at Harvard and Warwick Universities, where he was a National Merit Scholar and a National Science Foundation Fellow.

His keynote speech was focused on the challenge of financial literacy and the Internet's potential to improve people's ability to function well in the financial system. He began by defining financial literacy, which requires understanding of basic financial concepts, e.g. interest rates, inflation, GPD, etc., and is a pre-condition for financial capability. According to Prof. Scifferes, a substantial proportion of the public (30-40%) has limited financial literacy, and typically women, young people, and poorer people score lower on financial literacy. Moreover, he addressed the dramatic effect that the Internet has had on the financial sector. As it was mentioned, it has accelerated the pace of financial transactions and offered instant access to up-to-date financial information, including personal bank accounts, but at the same time, it has also made it easier for false rumors which affect financial markets to spread rapidly, and it has perhaps made it more difficult for individuals to distinguish reliable from unreliable financial advice. Financial institutions are already making extensive use of data mining and tracking both to target individuals and to predict market movements and automated trading and dark pools are making market pricing less transparent. Meanwhile, the authorities have been slow to respond to many of these developments which are being led by private companies, and, nowadays, there is also less public debate about policy and less trust from citizens in decision-makers.

According to Prof. Schifferes, the Internet can play a major positive role in addressing needs in this area, thanks to:

- Tools that improve financial literacy, including games, education tools, and assessment tools.
- Interactive automated counseling systems to help individuals examine their options in regard to debt investment and life course choices of a financial nature.
- Improvements in the way the media handles, displays and explains financial data and a stronger emphasis on financial literacy and less use of jargon.
- Experiments in peer-to-peer counseling and recommendation system.
- Better understanding of the working of commercial advice and recommendation systems such as declaring commissions.

Concluding, it is important that we both understand, oversight, and contribute (especially as researchers) to these developments, since the current economic climate requires that individuals become responsible for their own financial decisions, without the support of the state, and, therefore, both access to financial information and financial literacy are deemed of utmost importance.

As regards the presentations made in the IFIN workshop, these were highly multidisciplinary and consisted of the following:

- *What do people expect from a financial awareness platform? Analysis of an online survey results.* It presents the results of the questionnaire that was distributed to the wider public before the design-development of the PROFIT platform. The questionnaire aimed at evaluating target users' financial behavior, knowledge, awareness and capability and their attitude towards technology and Internet use, their suggestions for a financial awareness platform's material and functionalities, and their potential motives for participating and contributing in a financial awareness platform, such as the PROFIT platform. The analysis of the results presents some very interesting conclusions. Presented by Aikaterini Katmada (CERTH).
- *A reputation-based incentive mechanism for a crowdsourcing platform for financial awareness.* It focuses on a proposed reputation-based mechanism for encouraging and sustaining user participation in the PROFIT platform, which was designed taking into account both the best practices used in other crowdsourcing platforms, as well as the results from the online questionnaire distributed prior to the wider public. Presented by Anna Satsiou (CERTH).
- *Predicting Euro Stock Markets.* In this paper, the authors attempt to forecast the sign reversals of the Eurostoxx 50. Industrial portfolios are used as predictive variables, as well as an oil sentiment index constructed using textual analysis. Results indicate that both industry portfolios and oil sentiment index have some predictive power in one month period ahead. Presented by Ioannis Pragidis (DUTH).
- *On the Quality of Annotations with Controlled Vocabularies.* This work investigates ways to evaluate how well a controlled vocabulary fits a corpus. Towards this goal, the authors propose to find all the occurrences of the concepts from a controlled vocabulary (in form of a thesaurus) in each document of the corpus, and then try to estimate the density of information in the documents through the keywords and compare it with the number of concepts used for

annotations. The introduced approach is tested with an evolving financial thesaurus and corpora of financial news. The results prove the plausibility of the approach. Presented by Artem Revenko (SWC).

- *Interviews with experts from FEBEA member organizations regarding the benefits of a financial awareness platform – Analysis of the results.* Presentation of the results from the interviews and the online questionnaire regarding participants' attitudes towards a financial awareness platform. 19 interviews, suitable for qualitative assessment of user requirements were conducted and some preliminary conclusions to be used in the design of the PROFIT platform were drawn. Presented by Georgios Panos (UoG).

- *Financial literacy and attitudes to redistribution.* This work proposed a conceptual framework on how financial literacy could play a key role in shaping individual attitudes over government's redistribution policies, concluding on a significant negative relationship between financial literacy and attitudes in favor of government intervention for income redistribution. Presented by Georgios Panos (UoG).

- *Financial literacy and attitudes to devolution.* This work examined financial literacy in Great Britain introducing three questions in a population representative sample from the British Election Study (2015). Significant gender differences were found, similar to those documented for other Western countries, with males being more likely to respond correctly to all three questions, and females significantly more likely to respond that they don't know the response to at least one of the three questions. Additionally, students, the unemployed and the inactive performed worse. Furthermore, the authors examined the relationship between financial literacy and attitudes to devolution, in terms of a hypothetical forthcoming European Union membership referendum and the realized (then forthcoming) Scottish independence referendum. Presented by Robert Wright (Univ. of Strathclyde).

Roundtable Discussion

The roundtable discussion has been led by Georgios Panos, Professor of Finance in the Adam Smith Business School (University of Glasgow). Prof. Panos, a financial and labor economist, initiated the discussion providing the attendees with "food for thought". More specifically, he presented the following text to the participants and asked them to write in a paper the first word that came to their minds by reading this text:

"In X country, the financial wing of Y company, with 400 million customers, is constructing a credit scoring system. Its scoring algorithm seemingly relies on information beyond financial transactions, augmenting it with data from social media interactions to construct what is described as a "social credit score". The context of these developments is a government initiative to construct a national database of social credit scores for all citizens by 2020. Credit scores will be based on a "complete network covering credit records" and will serve to establish "the idea of a sincerity culture, and carrying forward sincerity and traditional virtues". This is a large scale and ambitious social experiment"

In summary, the idea that was provided to participants to ponder upon was the creation of what was called a "social credit scoring system" in X country by the financial wing of Y company, one of the world's biggest online shopping platform with 400 million customers. In the general case, a credit score system is used to predict the "creditworthiness" of an individual based on credit report information sourced from credit bureaus. However, in the particular text provided to the participants a new "social credit score" was mentioned that is also based on data from social media interactions, as part of a government initiative, presented as an ambitious social experiment.

The participants were asked to mention the first word that came to their minds regarding this so called "large scale social experiment". It was very interesting to see that the participants' first impressions on this matter were widely varied from totally negative to totally positive irrespective of their background. The negative characterizations of this idea were: "risky", "controlling", "authoritative", "Foucault-ian", "nightmarish", a "panopticon", and "scary", while the positive characterizations were "interesting", "bold", "ambitious", "innovative" and "challenging".

As the participants were later informed, this credit score is based on information extracted from the Y company's consumer information database. In particular its scoring algorithm seems to rely on the financial and consumption activities of its users, augmented with data from their payment, purchases, and social media interactions to construct a "social credit score", which users are even encouraged to

showcase on their social media. Apart from Y company, several other companies of X country also work on social credit scoring systems.

Given the fact that information of that kind is not readily available or easy to measure in X country, such a social credit score system could facilitate its measurement. On the other hand, attendees were concerned regarding the privacy of the citizen's credit scores and whether Y company's users are voluntary and knowingly rated by the social credit score. The negative future repercussions that a bad social score could have on an individual's life are something that everyone agreed that should be taken into serious consideration. These should also lead us into rethinking the serious social and ethical consequences of online platforms in general and financial web platforms in particular, as well as the use of social media in the personal finance domain. More importantly, we should ask "how far we are willing to go" and boundaries should be delineated. Thus, the controversy of this bold example in conjunction with the prominent heterogeneity of the audience as regards their work/education background and their views on the matter, led to a very interesting discussion.

A concluding remark from the discussions is that information should be put into context and perspective; more importantly, we should clarify what information is actually useful and necessary inside the platform, and what outside. Cultural differences, the cultural context, as well as differences based on the user group (e.g. user age) should be taken into consideration, in any case. The above-mentioned paradigm, e.g., takes place in a particular country. Nevertheless, this country does not have a national and widely-used credit system like those implemented in western countries. Therefore, it is argued that private lenders like Y company have created systems like that to better inform their lending decisions. Nevertheless, there are norms at an international level for how data should be collected and used for calculating e.g., credit scores. Legal and ethical issues should be taken into consideration. Therefore, important information that should be provided to users is how the personal information they may provide in a financial awareness platform is going to be used, who is going to use it, and whether it will be used in order to create a new product or for marketing purposes.

The role and importance of financial education was also mentioned. More specifically, we should not forget the importance of: (a) personal contact in financial education, and the fact that people still rely a lot on advice from friends, family, etc. for financial issues, and (b) a financial awareness platform such as the PROFIT platform should on one hand provide users with information from various sources in order to broadly inform them and provide them with a spherical vision, and on the other hand provide them with the tools and knowledge to assess the information, interpret the data in the right way and use the provided material in a rational way. Concerning for example financial forecasting, it was argued that we should provide users with information on what financial forecasting actually is, making them that way more aware and more cautious about the information provided. Thus, going a bit further, it could be argued that a social credit score system as the aforementioned one and like any other such innovative measure should be presented to the public along with all the needed information for people to understand how this is calculated, how it is being used, the negative effects it may have on their future decisions, as well as the importance of keeping a good credit history.

Another issue that arose in the roundtable discussion is how we can maximize and measure the social impact of a financial awareness platform. A prerequisite would be, of course, to reach and engage large numbers of users. A good product, as well as collaborations with institutions would be useful; especially, partnerships with financial consumer protection agencies could act very positively. However the platforms' social impact should not only be measured in terms of the number of people it reaches but most importantly in terms of attitude change of these people towards more responsible personal financial decisions. In order to be able to evaluate such behavior change, much care should be provided to identify the appropriate metrics and ways to do it, and this is another challenge for the PROFIT project.

Annex I: List of Attendees

No	Name	Surname	Affiliation
1	Zoran	Besak	ZEF
2	Christoforos	Bouzanis	Univ. of Glasgow
3	Ksenia	Ermoshina	ISCC Paris
4	Sestini	Fabrizio	EC DG Connect
5	Gian-Luca	Gasparini	SEFEA/FEBEA
6	Vasiliki	Gkatziaki	ITI-CERTH
7	Aikaterini	Katmada	ITI-CERTH
8	Maros	Mracna	EEA Communication Solutions
9	Caroline	Needham	Borough of Hammersmith & Fulham
10	Georgios	Panos	Univ. of Glasgow
11	Giacomo	Pinaffo	SEFEA/FEBEA
12	Ioannis	Praggidis	DUTH
13	Kresimir	Prevendar	ZEF
14	Aurora	Prospero	SEFEA/FEBEA
15	Artem	Revenko	Semantic Web Company (SWC)
16	Laura	Sartori	Univ. of Bologna
17	Anna	Satsiou	ITI-CERTH
18	Steve	Schifferes	City University London
19	Daniel	Sorrosal	Credal
20	Lubomir	Starek	EEA Communication Solutions
21	Panagiotis	Tournavitis	Bank of Karditsa
22	Robert	Wright	Strathclyde Business School

Annex II: Workshop Agenda

IFIN 2016 Program

MONDAY 12TH SEPTEMBER

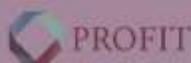|		
13:00-13:30	Registration	

Main Program

13:30-13:50	Welcome, short introduction of the PROFIT project and IFIN workshop	Anna Satsiou (CERTH)
13:50-14:40	Keynote Speech "The web and the challenge of financial literacy"	Steve Schifferes (City University London)
14:40-15:00	What do people expect from a financial awareness platform? Analysis of the online survey results	Aikaterini Katmada (CERTH)
15:00-15:20	A reputation-based incentive mechanism for a crowdsourcing platform for financial awareness	Anna Satsiou (CERTH)
15:20-15:40	On the prediction of the direction of Eurostoxx	Ioannis Pragidis (DUTH)
15:40-16:00	Advanced Analysis of Financial News Corpora	Artem Revenko (SWC)
16:00-16:30	*Coffee Break*	
16:30-16:50	Interviews with experts from FEBEA member organizations regarding the benefits of a financial awareness platform – Analysis of the results	Georgios Panos (Univ. of Glasgow)
16:50-17:10	Divergence of sentiment and stock market trading	Evangelos Vagenas-Nanos (Univ. of Glasgow)
17:10-17:30	Financial literacy and attitudes to redistribution	Mirko Moro (Univ. of Stirling)
17:30-17:50	Financial literacy and attitudes to devolution	Robert Wright (Univ. of Strathclyde)

Roundtable Discussions Session

17:50-18:50	Interactive Roundtable Discussions with workshop participants	*All* - Moderator: Georgios Panos (Univ. of Glasgow)
18:50-19:00	Closing	Anna Satsiou (CERTH)

VENUE   Room 4 - Via G. Capponi 9, Univ. of Florence, Italy

PROFIT

ifin-workshop.iti.gr