PROJECT PERIODIC REPORT

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1. Publishable Summary

The ROBUST project addresses the detection and management of risks and opportunities in huge scale business communities. Online business communities are a rich information eco-system and often represent a significant investment of resources. Thus, business communities need to be protected against risks threatening their value. Likewise, opportunities that help a community to reach its objectives need to be seized. In ROBUST these scenarios are developed around three strong use cases: the internal employee network of IBM based on Lotus Connections, the business partners in the SAP Community Network (SCN) and the public domain use case of Polecat which analyzes online communities in the public WWW in order to support decision makers with business relevant information.

In the first year of the project, the main objectives were to gather the requirements of community stakeholders in a community risk management scenario, to identify key features of healthy communities, to design models for risk representation, to develop scalable operators for the purpose of community data analysis, to extract first indicative patterns and predictions on the basis of use case data on a micro and macro-level and to establish the architecture and first prototype of the ROBUST platform.

These objectives have been reached and good progress has been made on all levels and in all work packages.

WP1 dedicated to modelling and managing Risks and Opportunities in online communities focused its work on three main areas during this first year. A large survey among stakeholders such as community owners and managers led to insights into the general goals and aims of the communities considered in the context of ROBUST. The participants in the survey were also asked to provide feedback on what are potential risks and opportunities w.r.t to reaching the objectives of a community. The outcome of the survey and a literature study formed the basis for a specification of risks and opportunities. This led to the design of compartment models that were used to analyse the data of the use case partners. Finally, a dashboard for visualizing community risks and graph network visualization has been brought to a first prototype state.

Community Data Management was addressed in WP2 by specifying, in close cooperation with all partners, the ROBUST Algebra consisting of core and advanced operators. The operators work on graph structures and textual data contained in the online community data. Aspects of the associated parallelization strategy and of suitable parallel processing platforms were analysed to determine their applicability in the use case scenarios. Work on the implementation of operators has commenced and parts of these implementations have already been committed to the existing open-source cloud computing library Mahout.

WP3 was concerned with the first two tasks of the work package: the identification and modelling of user needs and the modelling, measuring and tracking of user behaviour in online communities. Models for user needs were compiled based on the analysis of results from an extensive questionnaire distributed among the use case partners. User behaviour

was mainly addressed under the three aspects of activity prediction, user churn analysis and role compositions.

We have started work towards the community simulation platform in WP4 by collecting requirements from the use case partners. The collection covers technical aspects as well as features of community policies implemented in use case communities and other public online communities. Based on these requirements the first prototype of the ROBUST simulation framework RoSim was implemented in collaboration with Southampton ITI. This framework can simulate large scale web communities and supports the application of policies on the simulated communities as well as changes to these policies in order to observe the consequences on the community performance.

In WP5, the Community Analysis involved several activities across other WPs in addition to WP5. A clear structure of tasks and requirements has been set up and as a result several topics have been addressed and work has started at various levels of community data analysis. As a prerequisite for all tasks, several software modules responsible for loading, transforming, exporting and analysing large networks have been developed. Scalability of all methods has been a key requirement and was incorporated in all the approaches. Additional work in cooperation with other WPs addressed the area of behavioural analysis on a micro and macro-level. In this context, the concrete tasks of predicting churn in social networks and deriving the value of communities and their members have shown very fruitful results.

ROBUST is dedicated to the development of an integrated platform for the detection and management of risks and opportunities in online business communities. WP6 is leading the Agile Development and Platform Integration that focuses on this objective. The collection of requirements, setting up an agile and distributed development process suitable for the project and the provision of the architecture and first prototype of the ROBUST platform were the main contributions in the first year in WP6.

The first two activities in the context of WP7 were to define requirements for the Employee Use case and to extract, prepare and provide data from the IBM Connections communities. The requirements covered several aspects that were developed together with the other WPs and serve as input to the tasks on different levels. Data was made available early on to the project consortium and is frequently extended and updated. The first results in the analysis of the employee communities are methods for the identification of super users and the identification of different community types. Both methods feed back into the other WPs under the aspects of defining risk health indicators for different community types.

Similarly, also WP8 gathered requirements and prepared the data collection for the Business partners use case. This involved harvesting the data from the SCN community, storing it and making it available to the partners as well as understanding what subsets are useful in the planned scenarios. In order to select suitable subsets of the SCN community, a thorough analysis of the SAP Community Network was conducted. The analysis aimed to better understand the way SCN is functioning and the actual requirements of what needs to be analysed. For the second main objective in the first year a first basic prototype for the WP8 demonstrator (PULSAR) was the designed and implemented.

Also the Public domain use case in WP9 started with the provision of the community data. Contacts to public business communities were established and provided input on

requirements for this use case. The analysis of community health indicators based on language features as well as the first prototype of a visual and audio graphic equalizer for representing community health mark the progress in WP9.

In WP10 on Dissemination and Exploitation, the strategies for dissemination and exploitation were developed and documented. The project website has been established and is providing information on the progress of the project and the latest findings. A total of 32 research papers have been published at prestigious conferences and journals. Further dissemination activities include the involvement of the project in the co-organizing, supporting and participating in five international events: the Summer School on Ontology Engineering and the Semantic Web 2011, the ACM Web Science conference 2011, the 2011 Web Science Trust summer school, the International Summer School on Information Retrieval 2011 and the International Semantic Web Conference 2011. The ROBUST project has also contributed to an expert consultation meeting on research on social networks and user centric networked media on the invitation of the European Commission. Finally, ROBUST has initiated the Virtual Center of Excellence on Online Communities aiming to bring together research projects and leading experts in the field.

Project Management in WP11 was concerned with the successful initiation of the project. Adequate and efficient tools for communication and collaboration have been introduced and proven effective. Procedures for quality management and the detection and protection of IP assets have been established and documented. The timely submission of high quality deliverables as well as reaching all milestones as planned can be seen as a confirmation of successful project management.

Summarizing the achievements on the individual WP levels, work is progressing very well. All milestones have been reached, all deliverables have been submitted on time, the platform prototype is established and the first versions of components are being integrated. The findings in the context of ROBUST have been disseminated and published as several scientific publications at international conferences. Research from the ROBUST project was awarded the best paper at the ACM WebSci conference 2011 and won the first prize in the Billion Triple Track at the Semantic Web Challenge 2011.

The next steps of the project are to complete the integration process and to provide the first prototype of the ROBUST platform. This prototype will be deployed for testing among selected end users. Furthermore, progress on the individual WPs will be driven to extend and improve the methods composing the ROBUST framework.