The Inclusive Enterprise: Harnessing the Power of Social Data to Improve Workforce Retention and Well-Being

Research Contribution Proposal

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Robert-Jan Sips is leading IBM’s collaborative academic research programs in the Netherlands at the Center for Advanced Studies (CAS). He is actively involved in multiple research projects, currently focusing on Cognitive Computing (Watson), Medical Decision Support, Remote Sensing and Water Management. Prior to joining the CAS, Robert-Jan held positions at DaimlerChrysler, working on telematics for the Mercedes-Benz brand. After joining IBM in 2008, he focused on various remote sensing projects; in the automotive, smart grid and water domains. Most extensively, he was involved in IBM’s Global Center of Excellence for Water Management, working on machine learning to predict levee failure and -more recently- the economic feasibility of large-scale implementation of sensor-monitored levees in the Netherlands.

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Prof. dr. ir. Geert-Jan Houben holds a doctorate in computer science from the Eindhoven University of Technology (TU/e), the Netherlands (1990). Since then he has been working as an assistant and associate pro- fessor at the TU/e, as an IT-consultant with several consultancy firms in the Netherlands, as a guest-professor at the University of Antwerp, Belgium, as a guest-researcher at the Centre for Mathematics and Computer Sci- ence (CWI), the Netherlands, and as a full professor in information systems at the Free University of Brussels (VUB), Belgium, also acting as co-director of the WISE research lab at VUB. Since the summer of 2008 he is working as a full professor in Web-based information systems at Delft University of Technology (TUD), the Netherlands, performing research on large-scale information systems, specifically information systems that in- volve Web and Semantic Web technology. He has been involved in the organization of many events in the fields of web engineering and adaptation, is member of editorial boards such as ACM TWEB, and acted as PC Chair for conferences, most recently User Modelling, Adaptation and Personalization 2009, which clearly relates to this project.

Type of the presentation: Research Contribution

Title of the presentation: The Inclusive Enterprise: Harnessing the Power of Social Data to Improve Workforce Retention and Well-Being

Summary of the presentation:

For companies across the globe, building and sustaining a talent pipeline has become top priority. Job satisfaction is a core reason for employee retention and has shown to be more dependent on the organisational climate (e.g. working conditions, leadership and inclusion), than on variables such as structure, size, and pay. This research contribution presents the vision and first results of the "Inclusive Enterprise" initiative, developed as a collaboration between IBM Netherlands and TU Delft. We will show how social data gathered from heterogenous sensing sources can help to sense and foster inclusion and well-being in enterprise environments.

Extended Abstract[1]

For companies across the globe, building and sustaining a talent pipeline has become top priority An estimated 65% of executives report a lack of top talent in the ranks of their top 300 leaders and only 10% say that their companies retain most of their high performers. Consequently, in the 21st century, a "war on talent" became a reality, with organisations competing with one another to hire and retain scarce human capital.

Job satisfaction (the "degree to which individuals like their jobs"), inclusion ("a sense of belonging: feeling respected, valued for who you are; feeling a level of supportive energy and commitment from others so than you can do your best work"), and, in general, well-being have been shown to be a core reason for employee retention, leaving to extrinsic factors, such as salary and payment, a secondary role.

In this presentation we contribute a vision of an "Inclusive Enterprise", advocating well-being and inclusion as core properties of next generation enterprises. This research is the result of the combined efforts of IBM Benelux and the EEMCS Faculty at TU Delft University. We will present the current status of the project, including achieved results and ongoing work, and discuss the scientific, industrial, and societal challenges and opportunities coming from inclusive information systems.

To achieve this vision, we take a computer science angle, by asking ourselves the question: *how can computer systems help to foster inclusion and well-being in the enterprise?*. Indeed, variables such as organisation structure and size, and salary can be easily quantified and controlled; on the other hand, well-being and inclusion are difficult to capture and influence. The scientific challenge lies in the creation of methods and tools able to sense and affect the the organisational climate, to benefit its employees.

At the heart of our vision is an automated system that senses and influences the working environment of an employee. We aim to address both the physical and the personal environment. The former concerns sensing of environmental properties like the level of noise and light intensity; but also work-related properties such as proximity of other people and the features of the current workstation. The personal environment includes less tangible factors, such as one's background, expertise, (cultural) bias, emotions, mood and satisfaction itself. All together, these properties can provide a snapshot of the current status of an employee, which can be in turn used to create a more inclusive and personalise work experience.

Data play a key role to fuel the sensing and interpretation activities required to understand and influence job satisfaction. The data will ideally be collected from existing infrastructure, such as Building Management Systems and (Enterprise) Social Media. Online social media such as Facebook, Twitter and LinkedIn are used more and more by companies as a way to support business processes, marketing, and for competitive

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[1] Part of the content of this abstract is included in the paper "The Inclusive Enterprise: Vision and Roadmap", authored by the contributors of this proposal, and to be presented at the ICWE 2015 International Conference on Web Engineering.

intelligence purposes. Web social data can provide precious information about the personal, working, and social dimensions of employees. A recent work [1], currently under submission as an extended version in the Journal of Web Science, we showed how online social media could be used as a vehicle for a better understanding of the internal and external corporate dynamics. Supported by the analytical capabilities of platforms such as IBM Bluemix and Watson, Web social data can give better insights about the background, expertise, skills, and values of employees, thus enabling personalised interaction and working experience.

Physical enhancements provided by smart devices are helping to bridge the digital and physical worlds. Wearable technology is now collecting more data via sensors, communicating more information via displays, and truly augmenting a person's physical capabilities. Leveraging wearable devices allows companies to equip their employees with the technology they need to do better work, while improving operational efficiency and safety.

To cater for issues related to data sparseness, veracity, and sense-making, we envision a central role for crowdsourcing and human computation. Human can act as sensors for on-demand data creation, cleansing and linkage; we envision broad adoption of enterprise crowdsourcing techniques, including social sensing applications and pervasive human computation mechanisms.

Thanks to state-of-the-art semantic technologies (best exemplified by cognitive computing initiatives like IBM Watson), we are working on creating a semantic integration layer for heterogenous environmental and social data. We plan to capitalise on existing standardisation efforts for semantic data representation, while integrating enterprise specific and domain-specific knowledge about the company, its organisation and structure. The semantic integration layer fuels the workplace and workforce analytics components, providing an unified and updated view on the current status of the company and its employees.

We stress the importance of adaptation and engagement as driving forces for inclusion, and as a main tool to influence satisfaction on the workplace. Learning is a fundamental right and duty of a modern workforce. Technological advances and quickly evolving societal (and work-related) challenges demand for continuous learning path, integrated (and driven) by both the duties, ambitions, and expectations of employees. To this end, games with a purpose and gamification techniques can be a main tool to drive engagement. In a recent work, currently under submission in an international conference, we gathered strong evidence that a gamified experience can foster learning and social behaviour in employees.

We are conducting several exploratory studies aiming at understanding to which extent existing enterprise data sources can help framing the status of an employee. To this end, we are investigating how social media can be used to elicit expertise profiles, or characterising personality traits of employees. The next step is to investigate how environmental and working conditions aspects can be inferred from data produced by employees. Whenever existing data are not sufficient, we will develop methods for (enterprise) social sensing aimed at data collection and enrichment. Finally, we plan to experiment with ways to influence engagement and satis- faction. We are undergoing experiments aimed at providing better understanding of the fundamental principles of computer-mediated engagement mechanics in the enterprise.

[1] Alessandro Bozzon, Hariton Efstathiades, Geert-Jan Houben, and Robert-Jan Sips. A study of the online profile of enterprise users in professional social networks. In Proceedings of the companion publication of the 23rd international conference on World wide web companion, pages 487–492. International World Wide Web Conferences Steering Committee, 2014.