

Socio-technical Trends and Drivers for the Future Workplace: Findings from Expert Interviews

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Abstract: There is an ongoing discussion in the industry in particular in the complex and dynamic automotive domain on how the workplace can be arranged in the future to best possible support knowledge work. This discussion understands the concept of the 'future workplace' in a holistic way, i.e. including new forms of web based technology as well as new ways of working together. Respective scientific literature has already discussed social media to play a major role for the workplace, as social collaboration, social workplace and social business are already ubiquitously used terms. But what are major trends and drivers of the future workplace? This position paper presents results of recently conducted study on the future workplace, where 16 experts from academia and industry have been interviewed, to launch the discussion on a research agenda for holistic future workplace research. The interviewed experts mentioned most notably the relevance of social media, mobility and cloud services to facilitate knowledge work.

1 INTRODUCTION

Current advances in the development of information and communication technologies including most notably web based information systems have changed the way, how work is done. Against this background, scientists often speak of a transformation of the information society towards a knowledge (oriented) society. Currently, the support of knowledge work, knowledge sharing and collaboration at the workplace has become a hot topic once again. And knowledge management has already stimulated a lot of interest in the industry during the last two decades.

Since 1997 the Fraunhofer-Institute for industrial engineering (IAO) is dedicated to explore the future of work in its research project 'Office21' (office21.de). Every year experts from industry are surveyed on potential future scenarios of their working environment. For the report 'Information Work 2009' (Spath et al, 2009) about 1000 decision makers generated data on the potential impact of information and communication technology (ICT) in office and knowledge work. However, at this time nobody has yet spoken of social media and social software as an emerging trend in any scenario. But numerous tools supporting communication and collaboration have already been mentioned by the

participants, including groupware, document sharing and instant messaging. And these are all functions, which are currently taken over by Web 2.0 applications and social media (Stocker et al, 2012).

Moreover the Fraunhofer study provides a very valuable differentiation of the term 'knowledge work' making it more graspable. Knowledge work usually includes very complex and less determined tasks, which are hard to standardize into workflows. Knowledge work constantly generates new knowledge and builds upon the experiences of others. Hence knowledge work generates new requirements for organizational structures, controlling systems and the design of the workplace (Spath et al, 2009). Knowledge work may be illustrated along the three dimensions

- *complexity* (multifaceted and difficult tasks, high amount of coordination, challenging requirements on communication and cooperation),
- *autonomy* (spatial and temporal mobility, flexibility of working time, self-determined structuring of work), and
- *novelty* (continuously changing work tasks, need to extend one's knowledge, dynamic working environment).

These three dimensions are also discussed along with the emergence of social media, because implementing social media in organizations can act

as a catalytic converter for collaboration, production and innovation (Richter et al, 2011).

At respective industry events including for example the Enterprise 2.0 Summit (e20summit.de), practitioners discuss, how the adoption of social media can facilitate knowledge work in organizations. But not all decision makers are really open to the voice of preaching social media evangelists and early adopters. They often link social media to Facebook, only. As a result they are limited to thinking of private Facebook phenomena including waste of time by employees using social media during their working (Stocker et al., 2012).

In contrast, talks with responsible project managers from the automotive industry have shown that decision makers value the optimal design of the workplace of the future as a whole much more, than isolated ambiguous concepts including Enterprise 2.0, Web 2.0 and Social Media. Though the impact of '2.0' and 'social' becomes visible in almost all organizational departments, decision makers and consultants prefer terms including social collaboration, social intranet or social workplace, to avoid social media (Stocker et al. 2012).

After this brief introduction on knowledge work and social media, the paper provides a reflection of the handling of ICT in the automotive industry, which is a highly complex and dynamic environment highlighting the relevance of principles coming along with the adoption of social media. Next to this, the main findings of the future workplace study will be discussed. The paper closes with an outlook on a future research agenda.

2 AUTOMOTIVE INDUSTRY

An effective use of information and knowledge at work is the primary key to be more successful in the future, especially for the extremely knowledge-intensive automotive industry. The European market for cars is widely saturated, but there is a high demand in new markets. Privately owned cars begin to lose their value as status symbols. Nevertheless mobility is still important for all and especially for young people. There is a huge growth in car models, derivatives and embedded functionality. OEMs have defined strict requirements to among others reduce CO2 emission and enhance total vehicle safety. (KPMG International Cooperative 2010) Electro mobility, alternative drive concepts, assistants systems, and embedded communication facilities make the engineering of future cars much more complex. These factors afford methods and tools for

more cross disciplinary collaboration.

In this regard the management of all product information throughout the entire life cycle is one of the main challenges of the automotive industry. Thereby 'Product Lifecycle Management' (PLM) is considered as a comprehensive strategic approach to the management of a product throughout the whole product lifecycle. PLM covers various types of product related information from product design and manufacturing all the way to the end of use, after sales and service phases, as well as to the end of the lifecycle, to the scrapping of the product. The idea of PLM is to extend the concept of information and knowledge management to cover the whole life cycle of products to the extended enterprise (Lampela et al. 2011).

People in the automotive industry cooperate in very complex socio-technical systems and have to work with a plethora of different tools, standards, and sources of information. PLM includes configured elements of an enterprise such as processes, organizational structures, methods and related IT systems. However, recent research has shown that for a successful implementation of PLM additionally the human factor has to be well considered. Thinking outside the box, an optimal knowledge work support requires the form of new concepts at the workplace (Denger et al. 2011). To value the human factor in PLM has become a huge paradigm shift in automotive industry. This results in some initial points of contact on Social Media. The selective use of social media within PLM will have a particularly high relevance especially with regard to link communication and collaboration to product related information (Denger et al. 2011).

3 ELEMENTS OF THE FUTURE WORKPLACE

The authors assume knowledge workers to need the best possible support by their environment - a well balanced system of human factors, organization and technology. During a study conducted by the Virtual Vehicle Research and Test Center in 2012 (Denger et al. 2012), 16 experts from academia and industry have been questioned on how information and communication technology will impact and influence the workspace of the future. Study results have shown that academia and industry are still far away from any common understanding on how the workplace of the future will be designed.

However, there was a common understanding

that the workplace of the future has to be much more than purely implementing modern information and communication technologies at the workplace. The future workplace will depend on many aspects, including role of employees, corporate culture and practices and affinity to technology. It will have to offer more variants, including office design, furniture, ICT and organizational factors to cope with the increasing demands for innovation and creativity.

The blur of work and life and the increasing flexibility and mobilization of knowledge work were mentioned by some experts. Major trends and drivers for change are globalization, the increasing knowledge intensity of work and therefore the constant need for timely, location-independent and company-wide access to corporate knowledge, knowledge workers and problem solving skills. Some experts even predict a dehierarchization of organizations to survive the global dynamics and complexity of economy. In future there will be a shift away from regular and rigid work demands and processes to more flexibility and self-determination of work.

Currently the essential drivers of workplace of the future are becoming visible: These is an increasing popularity of mobile devices and the desire to use private devices for business purposes, a growing awareness of social media due to its usefulness in the private domain stimulating the need of such new ways for communication in business settings. A change in mentality towards mobile working and the increasing availability of cloud services for private purposes also count to drivers.

At the workplace of the future access to information and knowledge will be much more open and flexible. This will simultaneously increases the available range of information for employees. In response, employees will have to cope with information flows and define their demand for information and knowledge in self-organized and self-determined way.

The transparency of knowledge and knowledge holders will continually rise in companies, making people transparent as experts in their domain. The perception towards knowledge sharing will change. It will become more important to identify the relevant knowledge holder in organization than the explicated knowledge. This will result in a comprehensive generation of digital information, which can only be tapped by using enterprise-wide semantic search engines.

Although work is increasingly digitalized and

virtualized, most experts believe that physical offices will not entirely disappear in the future. People will always need a place to maintain their social contacts with colleagues. However, digital and social media will significantly shape the workplace of the future and the associated behavioral changes in the workplace will be triggered by digital natives. As organizational progress correlates to the degree of technology adoption, the enterprises in the ICT domain will define the roadmap to design the future workplace. However digital natives will adopt and shape information technology through their own use and act as an important driver, too. Experts recommend that young people should therefore be accepted in organizations as a driving force for the adoption of new technologies as they will bring the mind of modern and network-based thinking and working into organizations.

The division of work requires people different in age and discipline to collaborate in an effective way. In practice this raises a lot of challenges for industry, ranging from differences in the acceptance of Web-based technology to differences in communication patterns. Many experts believe that the use of modern technologies is fundamentally not a question of age. A potentially observed 'conflict' at the workplace is therefore not just between old and young, but rather between employees with a high drive for innovation and those with low one.

Older employees do not understand new technologies on principle, but the language chosen when new technologies are introduced to them as this does not reflect their needs. Current methods for introducing new information and communication technologies into organizations are one-dimensional and only tailored to fit younger employees. They do not get older people on board. A feasible approach is to purposefully bring together young and old employees at the workplace of the future, to solve tasks together. This will lead to a permanent, constructive and productive exchange of knowledge between the generations as both generations have their strengths and weaknesses.

4 CONCLUSIONS AND OUTLOOK

After an introduction into knowledge work, social media and the rising complexity of work in the automotive domain, this position paper illustrates key findings on a study of the future workplace (Denger et al. 2012) conducted in 2012. The aim of

this paper is to stimulate a more holistic research on the future workplace without overrating technological aspects.

In a nutshell, relevant enablers for the future workplace are rising adoption of mobile devices, awareness for social media and its benefits in the private domain, paradigm shift to mobile computing, free access to contents and applications on the Web, and increasing availability of cloud services in the private domain. As a result, employees become increasingly mobile and want to perform work from everywhere and anytime. Hence work will be further decentralized in time and place.

The feel-good factor known from using social media in the private context will have to play an important role for future corporate information systems, as enterprises strive for more creative ideas. The respective concept is called 'joy of use'. Social media will be used for internal communication and embedded into process-based information systems including enterprise resource planning and PLM.

Access to corporate information and explicated knowledge will be more open, leading to a much larger supply of information for the individual knowledge worker. As a result, employees will have to cope with streams of information generated by humans, software agents and things. They will decide what is important for their work assignment and hence generate their own information supply through filtering and unified access to decentralized information repositories. Employees will become experts based on their content generated and not based on their formal role or hierarchical position.

To stimulate further research on the future workplace, the authors aim to propose hypotheses based on their findings in the study:

- Hierarchies will be largely replaced by social networks.
- Social Media will change the way employees collaborate.
- Central ICT approaches will be replaced by decentralized approaches.
- Employees will work in information streams.
- Access to corporate information will more open up.
- Mobile devices will overtake desktop devices.
- Employees become experts based on content they generate.

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