

The Open Wearable Computing Group (OWCG) - a Community Building Instrument

Michael Boronowsky¹, Otthein Herzog¹, Peter Knackfuß², Michael Lawo¹,

¹*TZI - Universität Bremen, Am Fallturm 1, 28359 Bremen, Germany, {mb, herzog, mlawo}@tzi.de*

²*Info Consult GmbH, Universitätsallee 17, 28359 Bremen, Germany, Peter.Knackfuss@infoconsult.nu*

Abstract

Currently there is no single standardisation organization related to wearable computing. Wearable computing is still a technology of niches and labs. In this paper the ideas to establish an open organisation for standardisation facilitating a community building process are presented. It is the intention of the Open Wearable Computing Group to constitute a community in wearable computing. The interests of all involved stakeholders like users and developers, in industry and society from application to hardware and software have to be covered by the community being aware that only standardisation will facilitate a breakthrough for this new technology.

Keywords

Wearable computing, standardisation, community building

Communities' Topics addressed

Collaboration@Work: New collaboration approaches, Community based Collaborative Workplaces

Mobility@Work: Exchange of knowledge between the stakeholders in wearable computing

1 Introduction

Advances in miniaturisation in combination with the availability of low power computing devices and a ubiquitous wireless connectivity enable a broad range of innovative solutions. Ambient Intelligence (AMI) is the European catch phrase for an appealing vision, where today's conscious usage of a computer system will be substituted by a proactive ICT environment allowing the users an unobtrusive access to a pervasive knowledge space which in turn leads to ICT empowered users. One important goal is to strengthen the European worker, fostering the transition towards the European ICT-empowered mobile knowledge worker of the future. New groundbreaking developments are computers that can accompany a worker as natural as his own clothing: wearable computing.

Currently there is no single standardization organization related to wearable computing. Although organizations like ISO and IEEE/ACM deal with aspects of wearable computing and are major players in a particular technology sector, the ongoing standardization activities are spread over a wide range of different standardization organizations, addressing only isolated aspects of wearable computing as a part of a more general technological vision. These organizations are mainly focused on particular technological aspects, rather to follow a broader and more systemic approach.

2 Relation to Existing Theories and Work

A leading European vision for future economical and societal development is the Ambient Intelligence (AMI) paradigm. A major challenge of Europe is collaboration: bringing together the different stakeholders in related areas, addressing the needs from industry, aligning research excellence and facilitate developments by a targeted political process. Wearable Computing can

be considered as an instantiation of the AMI vision fixing several open parameters and providing concrete targets to make people work together with a common understanding. The Open Wearable Computing Group provides an environment to foster the concrete exchange between the important stakeholders helping to improve the innovation process towards a more systemic innovation.

3 Research Approach

Successful organisations like the Open Geospatial Consortium (OGC) [1] demonstrate that there is a need to put a strong application vision in the centre, and to group a wide range of different workgroups or special interest groups around, helping to realize the overall vision.

A vision for the Open Wearable Computing Group (OWCG) could be: “A world in which everyone benefits from wearable computing systems using any network, application, or platform”.

OWCG motivates the cooperation among technology developers, users, and integrators solving the difficult interoperability issues in wearable computing. It is expected that the next couple of years see technologies used in wearable computing becoming increasingly important. Prevailing standards are crucial in determining whether a technology is adopted or not.

The European Integrated Project “wearIT@work: Empowering the mobile worker by wearable computing” was set up by the European Commission to investigate “Wearable Computing” as a technology dealing with computer systems integrated in clothing to support the mobile worker. The project has 36 partners (mainly from industry), among them EADS, Skoda, HP, Microsoft, SAP, NTT DoCoMo, Siemens, and Zeiss and is coordinated by the TZI – Mobile Research Center of the University of Bremen. With a total project volume of 23.7 million € wearIT@work is the world-wide largest project in wearable computing. Based on four different pilot scenarios (emergency, variant production, maintenance, and the clinical pathway) one of the major goals is to follow a user-driven research agenda with a clear orientation towards the needs of the user – targeting European Leadership in this new economical field.

4 Findings

With the integrated European project wearIT@work a mayor step has been achieved to establish an Open Wearable Computing Group (OWCG) by preparing the ground for a paradigm-centered standardization body that will cope with the different aspects related to wearable computing in an interdisciplinary fashion, bringing together developers, integrators, users, policy makers, associations, etc. This approach requires identifying different work groups (see Figure 1) or special interest groups concentrating, e.g., on:

- Wearable Computing Hardware like computer systems, head-mounted devices, textile engineering, body sensors, communication,
- Wearable Computing Software like distributed wearable software platforms, services, HCI, context awareness, infrastructures for wearable computing,
- Wearable Computing Applications like general and sector specific (e.g., health, emergency, automotive, aircraft, shipbuilding, logistics, consumer) or task oriented (e.g., assembly, inspection, service, repair, picking, monitoring, collaboration)
- Users and Organisational Aspects of Wearable Computing like acceptance, sociological and societal issues, safety, security and privacy, training, dissemination, education,
- Educational Aspects, like preparation of high quality lecture material or the development and recommendation of appropriate curricula in the field of wearable computing.

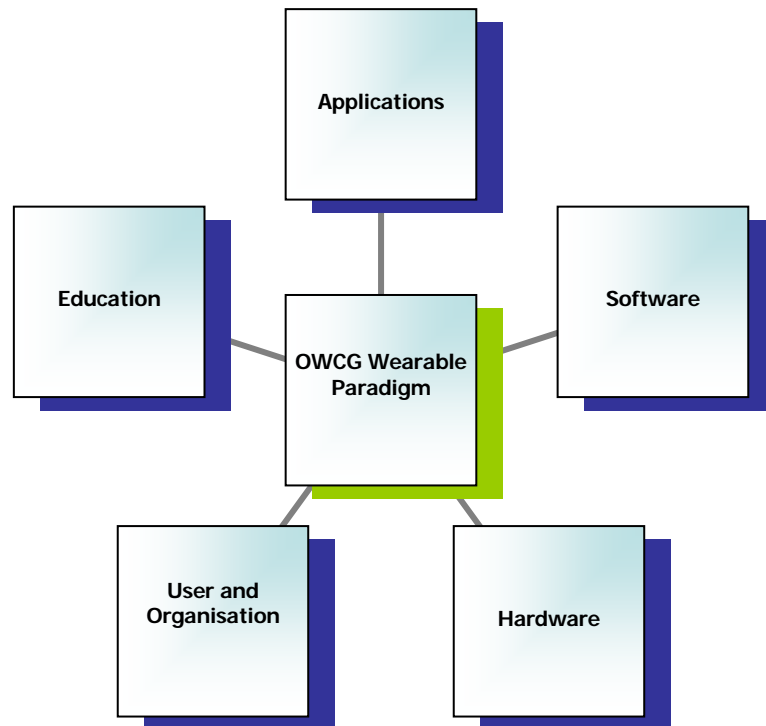


Figure 1: Topics of the Open Wearable Computing Group

These different groups are already reflected in the overall wearIT@work project structure and the project developed a concrete structure for the OWCG. However, the operation of the OWCG on a larger scale cannot be realized within the project and needs support from outside.

The OWCG will have to deal with existing work in particular areas to avoid the new invention of the wheel. However, the OWCG will provide an easier access to existing standards and will adopt or extend them where possible or will set new ones if no suitable standards exist.

The organization of the OWCG consists of three major blocks (see Figure 2)

- **Specification Program**
- **Interoperability Program**
- **Outreach and Community Adoption**

The aim of the *Specification Program* is to structure, prepare, and perform the core standardization work to be done. The Specification Program is managed by a *Planning Committee*, responsible for the initiation and guidance of the Standard Liaisons. The Planning Committee cooperates with a *Technical Committee* managing the *Working Groups* and the *Interoperability Program Management Team*. In the Working Groups the core standardization work is done when no relevant existing standards can be identified and a need for an own standard is in accordance with the interest of the Interoperability Program.

The aim of the *Interoperability Program* is to initiate and monitor the work done in the Specification Program and is application- and branch- oriented. It is part of the user centered approach motivating all activities of the OWCG. The Interoperability Program plays a key role in the OWCG. Here those interested in the results of the standardization results are involved. Beside those interested in the application of wearable computing devices also those interested in providing wearable computing components, systems, and solutions to customers are represented. It is the “political” body of the OWCG and thus also the venue for sponsors.

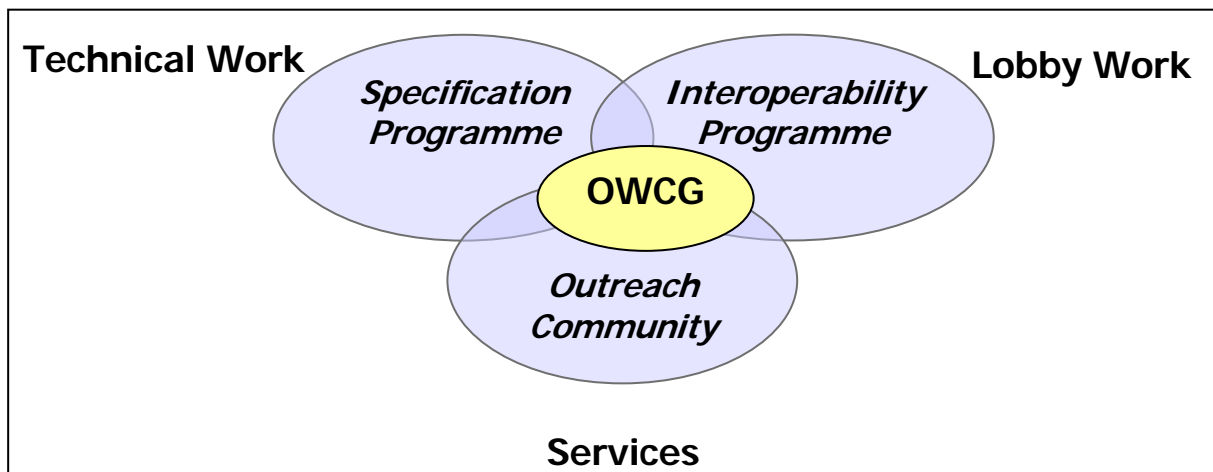


Figure 2: The Structure of the Open Wearable Computing Group

The aim of the *Outreach and Community Adoption* is to provide the members, sponsors, and the public with an optimal service.

5 Conclusions and Summary Recommendations

Wearable computing can empower professionals to higher levels of productivity by providing more seamless and effective forms of access to knowledge at the point of work, collaboration and communication. To make a business out of it needs the involvement of many different actors; it is not a topic of a single company or branch. Therefore standardization is necessary and the OWCG is intended to become the body providing this. To increase the awareness of the topic beyond the wearIT@work project the OWCG seems to be appropriate and is facilitated by the project and its strong industrial consortium.

6 References

- [1] The Open Geospatial Consortium: <http://www.opengeospatial.org/>

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Short biography



Prof. Dr. Michael Lawo is with TZI since 2004 as the Technical Manager of the IP 2004-004216 wearIT@work after being the CEO of a group of SME in the IT domain since 1999; from 1996 to 2000 he was CEO of an IT consulting firm which now belongs to UNILOG S.A./Paris and from 1991 to 1995 top manager information systems with the Bremer Vulkan group. From 1987 to 1991 he was the head of the industrial robotics department at the nuclear research centre in Karlsruhe. He is a 1975 graduate of structural engineering of Bochum University, received his PhD from Essen University in 1981 and became professor in structural optimization there in 1992. In 2000 he was appointed as professor of honour of the Harbin/China College of Administration & Management. He is author, co-author and co-publisher of five books and more than 110 papers on numerical methods and computer applications, optimization, IT-security and wearable computing.