

## Project Newsletter 5

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This is the penultimate edition of the NO-REST newsletter - the project terminated on 30 November. We are currently in the regular 45 days extension period, which is utilised for the write-up of the remaining deliverables and the various reports.

The consortium has been fairly busy since the previous Newsletter. Work focussed primarily on dissemination activities (little wonder at this late stage of the project), and on the impact assessment. Regarding the former, a workshop entitled 'Dynamics of e-Business Standardisation' was held in Edinburgh, and the consortium was very well represented at the SIIT conference (Standardisation & Innovation in IT) in Geneva. With respect to the latter, the project has produced some quite surprising results.

### Impact Assessment of ICT/e-Business Standards

The ultimate goal of the NO-REST project was to come up with a tool for an impact assessment of standards in the e-business/ICT domain. One selected approach to assess various impact dimensions of ICT standards was a series of online surveys of members of ETSI, CEN/ISSS and ITU.

One (still preliminary) finding from these surveys is a ranking of the various impact dimensions for formal ICT standards. The most positive impact is attributed to the dimension of product variety. This may be a contradiction at first glance, since standards are supposed to reduce variety. However, this contradiction can be explained by the fact that we are confronted with systems of various product components in the ICT sector. If standards do exist, components from different suppliers can be combined, which leads to a positive effect in product or systems variety. Furthermore, the existence of standards also makes the division of work within the value chain easier. If specific parts of the value chain can be provided by different companies, the variations in the end product will increase. Another explanation is that platform standards, like the European mobile communication standard GSM, provide the basis for numerous applications, which again increases the product variety.

The second series of impacts of ICT standards clusters around the issue of globalisation. International ICT standards are obviously a facilitator, not only for the world-wide procurement of ICT goods, but also for performing research and development on a world-wide scale, for the organisation of world-wide production

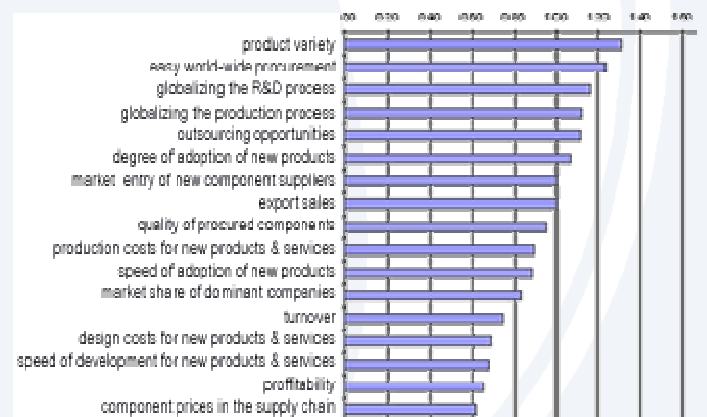
processes and for the opportunity to outsource various services.

Standards are obviously also an important tool for an effective collaboration within the production process in the ICT sector. A more traditional impact of standards among the top impacts is their positive influence on the degree of adoption of new ICT products, based on the promotion of positive network externalities between users and consumers relying on the same standard.

If we focus on the impact dimensions with the lowest scores, we find that ICT standards have only a rather modest effect on the prices of components. Obviously, the cost-reducing effects of standards in components by exploiting economies of scale are limited, which explains also that they are not very effective for increasing profits via cost reduction.

In summary, standards in the ICT sector are much more important for structuring relationships on the supply side by allowing outsourcing, world-wide procurement, production and even research and development. This is certainly positive for product variety. In contrast, the relevance of the traditional argument of the cost-reducing effects of standards is rather low and therefore also the related impact on the profitability of the companies.

Figure 1: Ranking of Impact Dimensions of Formal ICT Standards (Source: Fraunhofer ISI 2005) (0 = ambivalent to 2 = very positive)

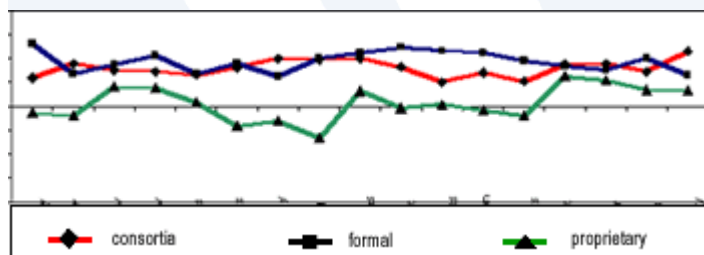


In addition to the ranking of the various impact dimensions of formal standards in the ICT sector, the comparison of the impacts of standards from different origins (see Figure 2) yields interesting insights.

First, it confirms that the assessment of proprietary de facto standards provided by a single company, like Microsoft, is in general less positive than those of consortia or formal standards. This view was expressed by stakeholders involved in the work of formal standardisation bodies like ITU, CEN/ISSS or ETSI. However, the majority of these stakeholders do not only contribute to formal standardization processes, but also try to produce and to promote own proprietary solutions as standards in the ICT markets. Second, the assessment of the impacts of formal and consortium standards is rather similar, which corresponds to the often very similar standardization processes. Third, there are some differences in the impacts between consortia and formal standards. Most important is the assessment that formal ICT or e-business standards are more beneficial for world-wide procurement, the globalizing of the R&D process and of the production process than consortia standards. This reflects that formal ICT and e-business standards have in general obviously a higher world-wide reputation than consortia standards (1). Furthermore, formal ICT and e-business standards foster the development of product and service variety more strongly than consortia standards, which can be explained by free use of formal standards only restricted by the requirement to pay licensing fees to owners of 'essential patents' according to fair, reasonable and non-discriminatory (FRAND) conditions. This structural difference explains in contrast the slightly higher impact of consortia standards on the profitability of the own company, which can generate higher licensing, but also product sales revenues by pushing consortia standards.

In summary, two major developments have to be pointed out. First, formal ICT and e-business standards are obviously structuring the markets by opening up new options in producing ICT goods or delivering e-business based services, even including the R&D process. Second, the difference between the impacts of formal ICT and e-business standards and consortia standards is rather small, whereas proprietary standards are assessed rather ambivalently.

Figure 2: Comparison of Impacts between Formal, Consortia and Proprietary Standards (Source: Fraunhofer ISI 2005) (-2 = very negative to 2 = very positive)



(1) There are certainly exceptions, like the standards of the W3C, OASIS, OMG, etc, which are highly regarded by most.

A first presentation on these issues was given at the joint NO-REST and 'Network Enterprise' workshop in Edinburgh (see below; the presentations of this workshop are available through the No-Rest web site.

### Dynamics of e-Business Standardisation

This workshop was organised by our partners from Edinburgh, and took place on 3 November. It was a joint event of two of their projects, NO-REST and 'Network Enterprise' (an ESRC funded study on the shaping of institutions and standards in e-business). The workshop was well attended - some twenty people showed up, with representatives from the Scottish Executive, NHS Scotland (National Health Service), and the British DTI (Department of Transport and Industry) among them.

Following some opening remarks by Rob Brightwell (of DIT), Ian Graham's talk on 'Dynamics of e-Business Standardisation' highlighted the need for interdisciplinary research in this field, comprising economics, sociology, and management. Questions to be addressed include, e.g., 'How many standards are enough?', 'How many standards development institutions are too many?', and 'What are the 'best' means of developing standards?'.

The presentation by Tineke Egyedi on 'Dynamics of Standards' identified three classes of causes for such dynamics: succession, maintenance, and implementation. Identified individual causes for dynamics in the maintenance of standards include, for example, technology development, regulatory change, and market dynamics. Dynamics during implementation may be caused by, e.g., ambiguity of natural language, ill-structured standards, the complexity of comprehensive, ambitious standards, 'bugward compatibility', and the level of tacit knowledge that has gone into a specification. Proposed remedies for the latter include, among others, the deployment of technical editors, use of pseudo-code or formal languages, and the definition of rules how to deal with options. The presentation also presented a framework for standards evolution that was developed within NO-REST.

Ralucca Bunduchi's presentation on 'RFID standardisation - development & implementation' discussed the challenges surrounding the development and adoption of RFID standards. The competition between the two global RFID standardisation bodies reflects the dual nature of the RFID standards themselves with the component manufacturers driven ISO focusing on generic technology standards, and the end-user driven EPC focusing on data specific standards. The danger is that future RFID technologies will be shaped only by the interests of component manufacturers, and large retailers' standards through their participation in ISO and respectively the EPC process.

'Selecting the Best Platform for ICT Standards Development', by Kai Jakobs, tried to provide the information that potential standards-setters should consider when selecting a standards setting body (SSB). It proposed classifications of both standards users and SSBs. The former focuses on users' strategies and business models, the latter describes SSBs' characteristics in different categories.

The presentation entitled 'Standards Developments in Healthcare', by Rob Woolman, first outlined the history of IT standards in the health-care sector. Subsequently, looked standards' achievements and failures were discussed, together with some factors that decide which way a standard goes. Manufacturer commitment, customer procurement leverage, and financial incentive are important contributors to a standard's success, whereas those developed by consultants, academics, or a central body, without manufacturer input, stand a good chance of failing.

Knut Blind talked about 'Impact Assessment of ICT Standards: Methods and Results'. This presentation first gave an overview of methods to assess the impacts of ICT standards. Subsequently, some specific results of various approaches to assess the impact of ICT standards were presented, with a focus on the results of a survey among ETSI, CEN/ISSS and ITU members. The main new insight was that there is little difference between the impacts of formal and consortia standards. Furthermore, standards are obviously more important for structuring markets than for cost savings (the traditional argument) (see above).

'ICT Standardization in ETSI. How to be fit for the purpose?' by Yves Chauvel, observed that the formal standardization bodies such as ETSI need to move to remain a significant player in an increasingly fragmented standards production market. New business models such as those offered by the open software approach are likely to impact standardization. The presentation also explained the action plan established by ETSI to examine the environment in which it will have to operate in the coming years, and evaluated the necessary options for change in its strategy and working methods.

### **Standardisation & Innovation in IT**

The SIIT conference took place 21 - 23 September in Geneva, Switzerland, and was hosted by the International Telecommunications Union (ITU). Eight technical sessions formed the core of the conference, complemented by three keynote speeches and two panels. NO-REST was represented by six papers and two panellists. The NO-REST papers and abstracts:

'+ vs. -: Impacts And Dynamics of Competing Standards of Recordable DVD-Media', by Stephan Gauch, analyses the impact and dynamics of competing standards and specifications with similar technological background by the concrete example of recordable and rewritable optical media based on Digital Versatile Disc technology.

Special attention is paid to the structure of competitor networks as well as their strategic allocation of Intellectual Property assets and information flows in form of amount of specifications forwarded from consortia specifications to formal standardisation bodies. Moreover, implications concerning timing of market entry and the role of installed base in the conflict are analysed. Also, problems of implementation and compatibility are discussed and the concept of 'multiple implementation' is introduced as a strategy for stable coexistence in standards wars.

'Knut Blind's paper on 'Factors Influencing the Lifetime of Telecommunication and Information Technology Standards: Results of an Explorative Analysis of the Perinorm Database' presents first explorative results of the study focusing on the lifetimes of formal standards in telecommunication and information technology. The analyses reveal heterogeneous lifetimes for standards from different technological areas, which can be explained by the different dynamics in the development of technologies. However, institutional differences based on very country-specific characteristics can also be found. In a second step, factors influencing the lifetimes of standards are identified. For example, in most cases standards which replace a preceding document have a longer lifetime compared to those without a predecessor. Likewise, standards with a successor have a shorter expected lifetime. In addition, an increased speed of technological change reduces the lifetimes of standards. It may be concluded that standardisation bodies should adapt their standard maintenance according to the specific requirements of technologies and the related markets, but should also homogenise their processes in order to avoid frictions in the development of technologies and markets.

The paper 'Mobile Communications and Standards Dynamics', by Eric J. Iversen & Richard Tee, addresses the changing role that standards play in achieving interoperability and stability. It starts with a discussion of what standards dynamics means in this context which it explores in terms of a drive towards dominant design in technology markets. Here, the paper distinguishes two main levels of standards dynamics. The first level involves adaptation of an individual standard when it is 'launched' and its subsequent interaction in the particular implementation environment. The second level involves higher order dynamics of the standard system in its adaptation to overall industry dynamics (involving technological factors, market factors, regulatory factors, etc). The paper goes on to look at three distinct cases of 'standards dynamics' in this light.

Discussing the 'Installation of an IEEE 802.11 WLAN in a Large University Setting', Kai Jakobs presents and discusses a case study on the implementation of an IEEE 802.11-based wireless LAN at Aachen University. The environment is presented, as well as the standard WLAN technology being installed.

Experiences and lessons learned so far are described based on desk research and on a number of interviews. A particular focus is on the problems and issues encountered which are rooted in the dynamic nature of standards, implementations, and installations. RWTH's rather individualistic approach towards achieving interoperability is described and discussed.

'Trends in ICT Standards in European Standardisation Bodies and Standards Consortia', by Knut Blind and Stephan Gauch, quantifies the standardisation activities in information and communication technology (ICT) of both formal and informal standardisation bodies by relying on the database PERINORM (for formal standards) and by analysing two CEN/ISSS surveys of standardisation consortia in 2000 and 2004, respectively. The first major insight is that the technical content of activities of formal and informal standardisation bodies is complementary rather than substitutive. Secondly, the significant reduction of the number of consortia suggests a consolidation of consortia activities, as the distribution of activities by technical fields does not change.

In their paper entitled 'Scale of Standards Dynamics in JTC11', Tineke M. Egyedi and Petra Heijnen present the findings of a quantitative analysis of standards dynamics in ISO/IEC JTC1, the formal international standards body for IT standardisation. It shows the volume of different types of change and developments over time. Certain themes are elaborated upon, such as whether there is a relationship between standards' age and areas of technology. The paper closes by drawing attention to a few maintenance policy issues, and raises several questions for follow up research.

For more information about the conference, please visit <http://www.sii2005.org>.

#### **Recent Publications**

Blind, K.; Jakobs, K.: NO-REST - A European Project Looking at the Impact of ICT and E-business Standards. Standards Engineering, vol. 57, no 5, 2005.

Gerst, M.; Jakobs, K.: e-Business in the Automotive Sector - Role and Situation of SMEs in Standardisation. To be published in: Small Business Clustering Technologies: Applications in Marketing, Management, Economics, Finance and IT. Idea Group Publishers.

Jakobs, K. (ed): Advanced Topics in IT Standards & Standardisation Research. To Idea Group Publishing, ISBN 1-59140-939-X2006.

Jakobs, K.: Shaping User-side Innovation Through Standardisation - The Example of ICT. To be published in: Technological Forecasting and Social Change, Elsevier, vol 73, no 3, 2006

Jakobs, K.: Even Much Needed Standards Can Fail - The Case of E-Mail. To be published in: TCN Journal, vol. 98, no. 1, 2005.