

Final Activity Report

NO-REST

Deliverable 11

Final Project Activity Report

Contract No: 507 626

Reporting Period March 2004 – November 2005

Due date of deliverable: 30st of November 2005

Actual submission date: 13th of January 2006

Start date of project: 1st of March 2004 Duration: 21 months

Organisation name of lead contractor for this deliverable: Fraunhofer-Institut ISI

1. Introduction

This final activity report of NO-REST reports the most important activities in the different work packages, the dissemination activities and important steps in the project management. It covers the whole duration of the NO-REST project.

The final activity report is structured as follows. At first, we present brief descriptions of the work that has been done in the work packages, and of the respective output. Then we list the dissemination activities ranging from the web site to the newsletter and numerous presentations at different conferences and workshops to journal publications. The final activity report closes with a brief overview of the project management.

2. Summary of WP1 Standards' Interactions with their Environments

The main objective of Work Package 1 was to construct a framework in which all factors that affect the standardisation process can be visualised and the interactions between them documented in a systematic way. In effect, WP1 described the commercial and organisational environment in which standardisation takes place. The partners engaged in WP1 were TNO-STB, Fraunhofer ISI and the University of Edinburgh.

WP1 was examining the standardisation environment in the context of 'business models' – which in our definition refer to the commercial and organisational topologies of key product and service areas for which standards are relevant. This includes consideration of the business models of standards development organisations and consortia. The aim was to investigate the consistency and/or variance of business models between stakeholders and to indicate the implications in terms of demand for standardisation.

WP1 was also exploring the socio-economic conditions and forces that motivate the process of adopting, adapting, revising and replacing standards. WP1 work contributed to a better understanding of the emerging dynamics of demand, which can come from both ICT producers and users.

The WP1 tasks originally scheduled for the first half of the NO-REST project were eventually completed with the revision of the combined deliverable D05/D06 "Report on demand factors and on the supply side for standards for networked organisations" in August 2005. The integrated Deliverable D05/06 addresses the following the Task 1.1 "Taxonomy of organisation and business models" in Section 2.1 and Section 2.5 of the deliverable. Task 1.2: 'Derivation of the demand for standards' is addressed in Sections 2.2 - 2.4.

The taxonomy of e-business standards was primarily developed by the University of Edinburgh. The issues surrounding business modelling and standardisation was mainly under the responsibility of TNO-STB. The demand side of standards was analysed by Fraunhofer ISI focusing for both for e-government and e-business standards, based both on secondary data but also on primary data of a sample of service companies active in e-business. Furthermore, the publication of standards in the ICT, telecommunication and e-business area was investigated by Fraunhofer ISI based on information of the PERINORM database and the CEN/ISSS surveys on consortia standardisation.

3. Summary of WP2 Standards Setting Bodies' Adaptability

Today, a broad variety of different organisations are active in standards setting in the ICT¹ domain. In addition to the ‘traditional’ accredited SDOs² (like, e.g., ISO, CEN, or, albeit somewhat less ‘traditional’, ETSI), these include primarily consortia (e.g., the World Wide Web Consortium, W3C), and industry fora (such as, for example, the Wireless World Research Forum, WWRF).

Yet, even within each of these categories organisations differ widely in terms of, among other aspects, overall goals, sectors of activity, membership, business models, and liaisons. Additional differences may be observed in the respective standards setting processes, with respect to, for instance, the required level of consensus, the observation of due process, and the equality of their members. Moreover, membership is free in some organisations, while others charge fees. Also, individual members of the working groups or committees may (have to) act in different capacities, e.g. as national or corporate representatives, or as individual experts.

Among other issues, this diversity represents a problem for individuals and companies wishing to initiate a standards setting activity. The question they need to address basically is ‘Which organisation suits my needs best?’. In an attempt to help these potential standards setters, WP2 has identified a set of characteristics to describe Standards Setting Bodies (SSBs). These characteristics have been used for a multi-dimensional classification of SSBs, which goes well beyond the typical distinction between SDOs, consortia, and fora.

To complement this description, three different categories of prospective participants in a standardisation activity were identified, and their respective high-level needs and requirements on an SSB were characterised:

‘Leaders’

They aim to control the strategy and direction of a consortium or an SDO’ committee. Large vendors, manufacturers, and service providers are typical representatives of this class.

¹ Information and Communication Technologies.

² Standards Developing Organisations.

'Adopters'

Adopters are more interested in influencing individual standards, rather than the strategic direction and goals of a consortium or an SDO's committee. Large users, SME vendors, and manufacturers may typically be found here.

'Observers'

Their main motivation for participation is intelligence gathering. Typically, this group comprises, for instance, academics, consultants and system integrators.

Subsequently, the identified demands and requirements the members of each respective category have were mapped onto the SSBs' characteristics. This resulted in a set of questions prospective standards setters should ask themselves in order to identify the SSB most suitable for a given proposed standards setting activity.

In addition, a study was performed to learn more about the perceived 'credibility' of SSBs. For instance, common wisdom had it that the outcome of the formal SDOs' process is of 'higher value' than the outcome of an industry consortium. But is this correct? The (qualitative) study suggests that it is not. Companies that need to either implement or set standards are not really interested in issues like 'consortium or SDO'. In fact, it seems that in most cases this distinction is hardly valid any more. Considerable importance is assigned to the processes adopted by an SSB; an SSB's characteristics need to be compatible with a company's strategy and its business model. SDOs do enjoy a competitive advantage in cases where regulatory requirements call for 'formal' standards.

WP2 was originally scheduled for the first year of the NO-REST project. However, the integration with the work undertaken in WP1 required an extension into the second phase of the project. The results of the Task 2.1 and Task 2.3 of WP2 were addressed in the following way in the final version of the combined deliverable D05/6 "Report on demand factors and on the supply side for standards for networked organisations". Task 2.1, the "Classification of standards setting bodies" is addressed in Sections 3 of the report. Task 2.3: 'Analysis of the impact of an SSB's credibility' is addressed in Section 4. The Task 2.2 "Definition and application of metrics for performance measurement" and Task 2.4 "Guidelines" are addressed in the final version of the deliverable D09/10 on impact assessment.

RWTH was WP2 leader. FhG-ISI and SINTEF-STEP contributed to the various tasks.

4. Summary of WP3 Dynamics of Standards

A main tenet of the NO-REST project is that standards are not static, as most literature would have it, but dynamic. Therefore, the aim of WP package 3 is 1) to acquire insight in the state of standards dynamics, that is in the overall stability of standards, and 2) to understand the causes of standards dynamics. The term 'standards dynamics' refers to the changes which standards undergo once they have been set or developed. Very little is known about this area, about how often it occurs and what it means for e-government and e-business infrastructures. WP3 therefore aims to provide more insight in the causes of standard dynamics (Why and how do standards change?) and the scale thereof (How often do changes occur?).

The workpackage produced two deliverables: D07 - the research findings and initial conclusions, and the follow-up D08 - the meta-analysis and heuristic framework.

In order to fulfil Task 3.1 "Conceptual framework to understand standard dynamics", the relevant literature was screened. The literature review on standard dynamics confirms that very little has yet been written on the subject. A wider literature review further points to the relevance of some interesting concepts in economic theory (switching costs) and technology studies (interpretative flexibility, innofusion and localisation). Section 3 of the deliverable D07 contains the results of the literature survey.

Task 3.2 "Empirical work on standard dynamics" contained two elements, namely case studies and quantitative studies.

The case studies on standards dynamics cover the two main types of standards relevant to e-business and e-government, namely standards for structured data exchange such as RosettaNet standards, RFID, e-GIF, SGML, and XML; and standards for the underlying infrastructure such as Internet addressing standards (IPv4, IPv6, NAT), grid standards (OGSI, WSRF), IEEE 802.11, and mobile telecommunication standards (GSM, Parlay, Symbian). For comparison, an extra case on consumer electronics has been added (recordable DVD standards). Together these cases illustrate several causes of dynamics, and particularly of maintenance and succession dynamics. In section 4 and 5 of D07, the results of the case studies are summarised.

The quantitative studies confirm one of the findings of the case studies, namely that standards are revised surprisingly often. Indeed, the bulk of work of some standards bodies is standards maintenance rather than standards development. Most changes are of an incremental rather than of a radical kind. This would suggest that grafting (i.e. downward compatible standardisation) is an option and that the negative impact of

change could therefore to a certain extent be manageable. Section 6 of D07 presents the results of the quantitative analyses.

The final Task 3.3 "Development of a heuristic model of standards dynamics" tried to derive a heuristic model on standard dynamics based on the results of the previous tasks. Two complementary heuristic models capture the main causes of standards dynamics. Regarding maintenance dynamics, seventeen more detailed causes of change are at work. These fall into four main clusters of causes, i.e.: technology development, regulatory change, market dynamics and characteristics of the standards development, and implementation setting. Regarding implementation dynamics, 'benevolent' (i.e. unintentional, partly avoidable) deviations are distinguished from malevolent and functional deviations. Twelve concrete causes of the former are identified. Some of these follow from decisions taken in the standards design stage (conceptual idea), and are flawed answers to fundamental dilemmas. The majority, however, seems to follow from institutional features of the SDOs. Specific suggestions for improvement are made in the three areas of drafting standards, their pre-implementation and implementation process support. These promise to reduce implementation dynamics.

The two models are applicable to both e-business and e-government. Indeed, general problems like the need for constant monitoring and updating are also visible in e-business and e-government. However, possibly for the development of upper layer standards in e-government, because governments are both standards users and key developers, controlled dynamics may be easier to achieve. The results of Task 3.3 are presented in deliverable D08.

TUD was WP3 leader, all participants except TNO-STB contributed to the WP (focusing on the literature survey, the case studies and the statistical analyses).

5. Summary of WP4 Impact Assessment

Based on the insights of the first three WPs, WP4 was devoted to develop and validate methods and tools to assess the impacts of ICT and e-business standards on both private and public networking organisations at various levels of analysis.

In a first Task 4.1 "Performance and Impact Assessment – State-of-the-art" the state-of-the-art in the context of ICT and e-business standards impact assessment was screened and relevant impact dimensions were identified. The summary of the ex post performance and the ex ante impact assessment was integrated into a combined deliverable D01/2 "Deliverable on Standards Impact Assessment". In contrast to the long tradition of assessing the impact of R&D policies and of governmental regulations – at least in the United States – the literature review and expert interviews reveal very little activities with respect to standards, especially ICT and e-business standards. On the macro- and sector level, we observe within the last ten years several exercises to assess the impact of the whole stock of standards on growth, trade and innovation. In contrast to these very general assessments, there are several case studies analysing especially ICT and e-business-related standards, but with a stronger focus on their emergence than on their impacts. Finally, a few company surveys were performed which intended either to identify the future demand for standards, but which aimed also to assess the general impacts of standards. Overall, the impact assessment of standards in general, and of ICT or e-business-related standards in particular, is underdeveloped.

This is even more challenging since standards have manifold impact dimensions including R&D-, market- and even social dimensions. This complexity requires both more sophisticated assessment methodologies and an intelligent combination of methodologies. Due to the lack of well developed and tested methodologies to assess the impacts of standards, we had to look for orientation in the tool boxes for RTD evaluation and regulatory impact assessment. In the literature we identified various methodologies ranging from case studies, surveys, cost-benefit analyses to econometric models and foresight exercises.

All these methodologies have general weaknesses and strengths, but they are also – to different degrees – applicable to ex ante or ex post impact assessments, and to the above listed impact dimensions.

Based on the insights from Task 4.1, but also taking into account the results of the other three WPs, Task 4.2 focused on designing tools for ex post and ex ante impact assessments, and Task 4.3 on their implementation and validation.

The main element was the development of a questionnaire in order to survey the members of ETSI. Subsequently, an adapted version of the questionnaire³ was sent to the more e-business-focused members of CEN/ISSS. Finally, ITU was also interested in performing a survey among its members. This second additional survey was carried between summer and autumn 2005.

Moreover, a dedicated impact-related questionnaire was developed and a small-scale Delphi survey was conducted of the members of a workshop on telecommunication forecasting. This survey focused on both the future demand for standards and the possible future impacts of recently released ITU standards.

The feasibility of an econometric analysis to assess the impact of ICT related standards on growth in OECD countries was tested and a feasibility analysis was performed.

The guidelines for the case studies of WP3 were extended in order to encompass also possible impact dimensions.

Finally, appropriate examples to perform an impact assessment in practice were selected. The feasibility, methods and results of the performed impact assessments have been evaluated. Based on these experiences, final guidelines for tools for an impact assessment have been proposed. They will be distributed among the relevant stakeholders in standardisation processes.

In addition to the development of single impact assessment methodologies, TNO-STB and Fraunhofer ISI have co-operated intensively to construct a prototype of a general ideal impact assessment framework.

Based on the various experiences and results of the numerous implementations of several methodological approaches, in a final step it was possible to assess the various approaches according to a series of criteria.

FhG-ISI is WP4 leader, all participants contributed to the WP in the phase of developing the survey tool or in extending the case studies of WP3 to integrate impact dimensions.

Task 4.4 "Dissemination" is reported in next chapter separately.

³ Which still allowed a comparison to the responses of the ETSI members.

6. Dissemination Activities

From the very beginning of the project a web-page www.no-rest.org was set up, which has been administered by ETSI. The project site contains all necessary information about the partners, the work packages, events and presentations, and findings.

In total five editions of the project newsletter were distributed:

- No. 1; July 2004
- No. 2; November 2004
- No. 3; May 2005
- No. 4; September
- No. 5; January 2006

In addition, a number of workshops were organised by consortium members at various international conferences :

- Session on 'Incompatibility of Standards Implementations - Exploring the Problem' at the EASST / 4S Conference 2004, Paris, August 25-28, 2004 organised by Tinneke Egyedi and Kai Jakobs.
- Session on 'ICT Standards Setting and the Social Sciences', at the EASST / 4S Conference 2004, Paris, August 25-28, 2004 organised by Kai Jakobs.
- Workshop 'IT Standards – the Basis of the Information Society', organised for INFORMATIK 2004 – the annual conference of the German 'Gesellschaft für Informatik', in Ulm by Kai Jakobs.
- Workshop on 'Standards and Standardisation for e-business' at echallenges 2004, Vienna, October 27-29, 2004 organised by Kai Jakobs
- NO-REST Workshop 'Towards an Impact Assessment of Standards' at CEN, Brussels, November 25, 2004 organised by Knut Blind and Kai Jakobs
- Workshop on 'Interoperability Standards – Implementation, Dynamics, and Impact' in conjunction with the Interop-ESA conference on Interoperability of Enterprise Software and Applications, Geneva February 21-25, 2005 organised by Kai Jakobs.
- Workshop 'Promoting the Third Estate in ICT Standards Setting', at the Triple Helix Conference in Turin May 2005 organised by Kai Jakobs;
- Project Workshop "Impact of Standards! – New Insights" at ETSI, Sophia Antipolis, May 27 organised by Yves Chauvel, Knut Blind and Kai Jakobs
- Workshop Dynamics of e-Business Standardisation, November 3rd 2005, University of Edinburgh, Edinburgh, UK organised by Robin Williams.

Further Presentations:

- Blind, K.: Standards and Trade: Theory and Evidence, presentation at EU-Asia Link meeting, Helmut-Schmidt-Universität, Hamburg, 16th of August 2004
- Blind, K.: Participation in Standardisation and Open Source Development: Empirical Evidence from Germany, presentation at INFORMATIK 2004 – the annual conference of the German ‘Gesellschaft für Informatik’, in Ulm, 21st of September 2004.
- Blind, K.: The Economic Impact of Standardisation: Theory, Methods and Evidence, presentation at Standardisation Workshop organised by the Danish Standardisation Institute, in Copenhagen, 24th of September 2004
- Blind, K.: The Delphi methodology and other impact assessment methodologies: Opportunities and challenges for standardisation and regulation bodies in the telecommunication sector, at an Expert Workshop on "Adjusting Forecasting Methods to the Needs of the Telecommunication Sector" at International Telecommunication Union, in Geneva, 25th October 2004
- Blind, K.: A Taxonomy of Service Standards and a Modification for E-Business, at e-challenges 2004, Vienna, 29th of October 2004
- Blind, K.: Trends in ICT Standards in European Standardisation Bodies and Standards Consortia IEEE Conference "Standards for Global Business"
- The European Conference on Collaborative Trends in European and Global Standardisation Munich, Germany, the 27th of September 2005
- Blind, K.: The Impacts of ICT Standards: Methodologies and Results at CEN/ISSS conference "Interoperability – The backbone of eBusiness" Utrecht, November 28th 2005
- Egyedi, T.: Standards Dynamics, presentation at EU-Asia Link meeting Helmut-Schmidt-Universität, Hamburg, Germany, 17th August 2004
- Egyedi, T.: Difficulties Implementing Standards: Steps in a research programme, presentation at EASST conference, Paris, 27th August 2004
- Gerst, M.: The Social Shaping of Networks in the Automotive Industry: Tensions between Automation and Flexibility, presentation at EASST conference, Paris, 27th August 2004
- Gerst, M.: The Implementation of a Supplier Portal in the Automotive Industry – Standardisation from a SME perspective, presentation at INFORMATIK 2004 – the annual conference of the German ‘Gesellschaft für Informatik’, in Ulm, 21st of September 2004
- Gerst, M.: The Adoption of Standardised Technology in the Automotive Industry, presentation at e-challenges 2004, Vienna, 28th October 2004
- Hawkins, R.: The evolving relationship between formal and informal standardisation. Presented at the Workshop of the EU’s ASIA-Link Project ‘Development of a Curriculum for Standardisation in Companies and Markets’, Hamburg, Germany, August 2004
- Jakobs, K.: ‘Shaping ICT Standardisation’. Presented at the Workshop of the EU’s ASIA-Link Project ‘Development of a Curriculum for Standardisation in Companies and Markets’, Hamburg, Germany, August 2004
- Jakobs, K.: ‘The Third Estate - The Role of SMEs in ICT Standards Setting, at e-challenges 2004, Vienna, 29th of October 2004
- Jakobs, K.: Co-operation in ICT Standards Setting. To be presented at: Innovation Pressure – Rethinking Competitiveness, Policy and the Society in a Globalised Economy, Tampere, 2006.

Publications:

- Blind, K. (2005): Factors Influencing the Lifetime of Telecommunication and Information Technology Standards: Results of an Explorative Analysis of the PERINORM database - Proceedings from the 4th International Conference on Standardization and Innovation in Information Technology, Geneva, pp. 11-28.
- Blind, K.: Interoperability of Software - Demand and Solutions. Proc. WS Interoperability Standards - Implementation, Dynamics, and Impact. HERMES Science Publishing Ltd.
- Blind, K.; Gauch, S. (2005): Trends in ICT Standards in European Standardisation Bodies and Standards Consortia - Proceedings of the 4th IEEE Conference on Standardization and Innovation in Information Technology, pp. 29-39.
- Blind, K.; Jakobs, K.: Networked Organisations - Research into Standards and Standardisation. NO-REST: An FP6 IST Project. Proc. Interop-ESA, Geneva, 2005.
- Blind, K.; Jakobs, K.: NO-REST - A European Project Looking at the Impact of ICT and E-business Standards (invited paper). Standards Engineering, vol. 57, no 5, 2005.
- Blind; K.: A Taxonomy of Service Standards and a Modification for E-Business, in: eAdoption and the Knowledge Economy: Issues, Applications, Case Studies edited by Paul Cunningham and Miriam Cunningham, IOS Press, Amsterdam, pp. 264-270.
- Bunduchi, R.; Gerst, M.; Graham, I.; Williams, R.: Driving Grid Standardisation - the role of the business community. Proc. 10th EURAS Workshop, Mainz Scientific Publisher, 2005.
- Chauvel, Y.: ETSI in a changing standardization landscape. Proc. 10th EURAS Workshop, Mainz Scientific Publisher, 2005.
- Egyedi, T. M.: Standards Dynamics. Proc. WS Interoperability Standards - Implementation, Dynamics, and Impact. HERMES Science Publishing Ltd.
- Egyedi, T.M. & J. Hudson (2005). 'A Standard's Integrity: Can it be Safeguarded?', IEEE Communications Magazine, 43/2, 151-155.
- Egyedi, T.M. & J. Hudson (2005). 'Maintaining the Integrity of Standards: No Passage East of Java', EURAS Yearbook, Vol. 5/ Homo Oeconomicus, 22/1, pp.1-20, Muenchen, Germany: Accedo Verlag.
- Egyedi, T.M. & J. Vrancken (2005). 'Why are Standards' Implementations Incompatible?', in: Tarek Khalil (Ed.), Proceedings of the 14th International Conference on Management of Technology, CD, ISBN 0971296472.
- Egyedi, T.M. & P. Heijnen (2005). 'First Steps in the Analysis of Standards Dynamics in JTC1', in: Tarek Khalil (Ed.), Proceedings of the 14th International Conference on Management of Technology, CD, ISBN 0971296472.
- Egyedi, T.M. & P. Heijnen (2005, forthcoming). 'Scale of Standards Dynamics: Change in formal, international IT standards', in S. Bolin (Ed.), The Standards Edge: Future Generation. Felton, CA: Bolin Communications.
- Egyedi, T.M. & Z. Verwater-Lukszo (2005). 'Which standards' characteristics increase system flexibility? Comparing ICT and Batch Processing Infrastructures', Technology in Society, 27/3, pp. 347-362.
- Gauch, S. (2005a): Impacts and Dynamics of Competing Standards of Recordable DVD-Media - Interoperability of Enterprise Software and Applications, London: Hermes Science Publications, pp. 299-309.
- Gauch, S. (2005b): Impacts and Dynamics of Competing Standards of Recordable DVD-Media, Egyedi, T.M.; Sherif, H.M. (eds.), Proceedings of the 4th International Conference on Standardization and Innovation in Information Technology: IEEE.

- Gerst, M.; Bunduchi, R.: Current issues in RFID standardisation. Proc. WS Interoperability Standards - Implementation, Dynamics, and Impact. HERMES Science Publishing Ltd.
- 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.
- Iversen, E. J.; Tee, R.: Standards dynamics and industrial organization in the mobile communication area: three cases. Proc. WS Interoperability Standards - Implementation, Dynamics, and Impact. HERMES Science Publishing Ltd.
- Iversen, E.; Tee, R. Mobile communications and standards dynamics. Proc. SIIT 2005, IEEE publishers, 2005.
- Iversen, E.; Tee, R. Standards dynamics and industrial organization in the mobile telecom sector. In Pamberg, C & E. Bolin (eds.) Special Edition of INFO. Forthcoming 2005.
- Jakobs, K. (ed): Advanced Topics in IT Standards & Standardisation Research. Idea Group Publishing, ISBN 1-59140-939-X2006.
- Jakobs, K.: 'Shaping Future ICT Systems Through Today's Standards Setting'. Proc. UKAIS 2004, Glasgow.
- Jakobs, K.: 'Some Socio-Technical Issues in ICT Standards Setting'. Proc. Workshop on Understanding Sociotechnical Action, Edinburgh, 2004.
- Jakobs, K.: 'The Third Estate - The Role of SMEs in ICT Standards Setting, in: eAdoption and the Knowledge Economy: Issues, Applications, Case Studies edited by Paul Cunningham and Miriam Cunningham, IOS Press, Amsterdam, pp. 241-248.
- Jakobs, K.: Does an ICT Standards' Success Depend on Its Origin? (invited paper). Standards Engineering, vol. 57, no 3, 2005
- Jakobs, K.: Does an ICT Standards' Success Depend on Its Origin? (invited paper). Standards Engineering, vol. 57, no 3, 2005.
- Jakobs, K.: Even Much Needed Standards Can Fail - The Case of E-Mail. To be published in: TCN Journal, vol. 98, no. 1, 2005.
- Jakobs, K.: Installation of an IEEE 802.11 WLAN in a Large University Setting. Proc. SIIT 2005, IEEE publishers, 2005
- 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.; Wallbaum, M.: Scores of Rule-Setters - Co-operation and Competition in ICT Standards Setting. Proc. SCORE Conference, 2005.
- Jakobs, K.; Wallbaum, M.: Selecting the best Platform for ICT Standards Development. Proc. UKAIS 2005, Northumbria University Press.
- Sherif, M.H., Egyedi, T.M. & K. Jakobs (2005). 'Standards of quality and quality of standards for Telecommunications and Information Technologies (ICTs)'. Proceedings of the 4th International Conference on Standardization and Innovation in Information Technology, September 21-23, 2005, ITU, Geneva, Switzerland, pp.221-230.
- Wendel de Joode, R. van & T.M. Egyedi. 'Handling variety in Java & Linux: Coordinating Mechanisms for the Future Generation?', in S. Bolin (Ed.), The Standards Edge: Future Generation. Felton, CA: Bolin Communications.

7. Project Management

Regarding the project management we have to report that the project coordination group (PCG) met three times. At the first meeting hosted by TU Delft between the 18th and 19th of March, the WP leaders were nominated. WP 1 is managed by Richard Hawkins (TNO-STB), WP 2 by Kai Jakobs (RWTH Aachen), WP 3 by Tineke Egyedi (TU Delft) and WP 4 by Knut Blind (Fraunhofer ISI). This meeting served mainly for clarifying the WPs, the different tasks and further steps. Almost all members of the PCG met during the annual workshop of the European Research Academy for Standardisation EURAS in Paris for an interim meeting to discuss recent issues. At the second official PCG meeting taking place in Oslo from the 5th and 6th of July, first results of the different WPs were presented and first dissemination activities including the first interim workshop planned. The third meeting of the PCG was hosted by Fraunhofer ISI in Karlsruhe from the 7th to the 8th of October. Besides reporting further progress within the different WPs, the upcoming interim workshop was prepared regarding the content which will be presented. Furthermore, the survey among the ETSI members, which is relevant for all WPs was discussed based on a set of hypotheses and a first draft of the questionnaire. The fourth meeting of the PCG was hosted by RWTH Aachen and was devoted to the combined deliverable of WP1 and WP2 on the supply and demand of standards and to the finalisation of the survey among ETSI members. A further project meeting took place around the first project review on the 21st of February in Geneva. The fifth meeting of the PCG took place on the 26th of May before the project workshop hosted by ETSI in order to prepare the presentations of the workshop. A sixth project workshop was organised around the SIIT conference in Geneva on the 23rd of September 2006 in order to discuss final steps. The final project workshop was scheduled on the 4th of November in Edinburgh to collect feedback on the whole project and discuss the requirements for the final reporting and future publication plans..

In addition to the PCG meetings several bilateral meetings took place within the different WPs. Richard Hawkins from TNO-STB spent even two weeks in October at Fraunhofer ISI in order to develop a common comprehensive framework for standards impact assessment and the questionnaire for the ETSI survey. Kai Jakobs spent several days at the University of Edinburgh to clarify the linkages between WP1 and WP2 as well as WP3.

NO-REST was also present at the following coordination workshops “ICT for Business” cluster meeting of e-business projects:

- 26.4 2004 , Brussels
- 9.-10.12.04, Brussels

- 21.2.05, Geneva
- 18.11.05, Brussels,
- 10.1.06. Brussels.

Finally, NO-REST participants are involved in the European e-Business Interoperability Forum organised by CEN/ISSS, which are developing first steps towards standards in the e-business area.