



Ecosystem infrastructure for smart and personalized inclusion
and PROSPERITY for ALL stakeholders

D503.4 Standardization and Concertation Report

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6	2015-07-29	G. Zimmermann	HDM	Final brush

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Executive Summary

We see standardization and concertation as vital activities for GPII and Prosperity4All to grow and to make their results available globally during the project, and even after the lifetime of the project.

Our goals and efforts in this regard are three-fold:

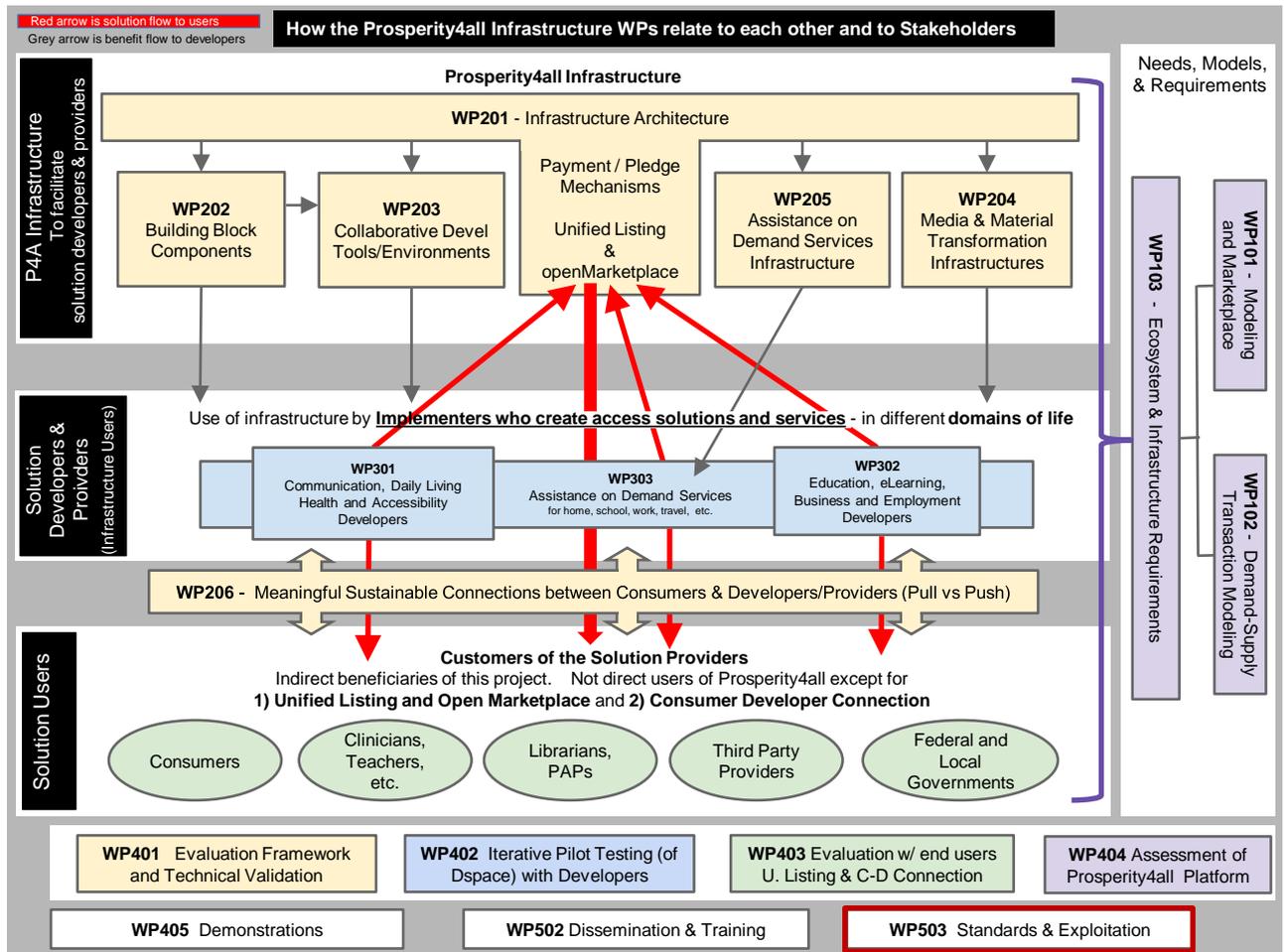
1. **Reuse existing standards and technologies.** Whenever a standard or technology is available that we can use, we don't want to "re-invent the wheel". GPII and the project draw heavily from mainstream standards and technologies, such as XML, JSON, WebSockets and RESTful communication.
2. **Develop, validate and maintain core GPII standards.** For some core aspects of GPII, we have identified the need for developing our own standards:
 - The description of a person's individual preferences as "personal preference set", and the description of appropriate user interface resources. *ISO/IEC 24751 – Individualized adaptability and accessibility in e-learning, education and training* – addresses this need.
 - The ability for user interfaces to adapt to a user's needs and preferences through mechanisms that integrate a user interface from various sources at runtime. *ISO/IEC 24752 – Universal Remote Console* – addresses this need. In addition, we develop *URC device templates* to make it easy for vendors to make their products URC- and GPII-compatible.
3. **Work towards adoption of GPII standards in other standards and technologies.** We do this on three layers:
 - Work with international standardization organizations and consortia: ISO/IEC, openURC Alliance, W3C, IEEE, IMS Global Learning Consortium, and Schema.org.
 - Work with national standardization organizations.
 - Cooperation and concertation activities with various project, communities and platforms, including Access for all Ontario, AFE-INNOVNET, ANEC Working Group on Design for All, ERPB Working Group on Mobile and Card Based Contactless Proximity Payments, European Innovation Partnership on Active and Healthy Ageing (EIP-AHA), European Multistakeholder Platform (MSP) on ICT Standardization, Inclusive Learning Project, MOOC Accessibility Partnership (MOOCAP), Preferences for Global Access, and ReAAL.

Multiple Prosperity4All partners are involved in carrying out standardization and concertation activities. The GPII standardization task-force was established to coordinate this work within GPII, and the pertinent plan is laid out in the GPII standardization roadmap.

1 Contribution to the global architecture

This deliverable has been developed out of work package 503: Market observatory and exploitation. Figure 1 illustrates the overall work package structure of Prosperity4All, and how the deliverable fits in.

Figure 1: Overall Picture of Prosperity4all. WP503 which this deliverable belongs to, is marked by a dark red frame. Note for screenreader users: A textual description is attached to the image (tagged format).



D503.4 mainly draws from SP2: Building the technological infrastructure. In particular, WP201, WP202, WP203, WP204 and WP205 are the work packages in which the core standards (see section 4.1) that are developed in the context of Prosperity4All are applied and validated. This deliverable was developed in coordination with the GPII standardization task force (see section 2.3) within WP503. It documents the current status of the standardization and concertation activities within Prosperity4All and GPII.

2 Introduction

Prosperity4All will adopt a pragmatic approach to standardization (see also WP503 description), which will be based on influencing standards through partners that already follow and/or influence related work in the standardization bodies. This approach will alleviate overheads associated with the identification of the right standardization body for a particular contribution, as well as with the time needed to get in touch with the standardization body and to understand the scope of the relevant activities.¹

The standardization approach of Prosperity4All carefully considers and integrates existing involvements of the consortium partners in standardization and concertation activities. By doing so, our efforts are not only restricted to the project's lifetime. It is our goal to make a sustainable impact on the way user interfaces are designed and developed in mainstream technologies in the long run.

2.1 Context for this deliverable

This deliverable has been developed in the context of WP503, which is Prosperity4All's working space for dealing with issues of business models, exploitation, standardization and concertation. Together with D503.1, Market Analysis and Technology Trajectory, this is the first deliverable of WP503. It builds upon the overall work done in Prosperity4All, including the deliverables that have already been finished.²

This deliverable reports from the current work in T503.3, standardization and concertation activities. From the 11 objectives set out for WP503 in the DoW, the following are most relevant for T503.3:

- *Establish a network of external collaborators around Prosperity4All and GPII in general;*
- *Keep track of state of the art in standardization work and current EC and International policies and trends in accessibility and harmonise project work with current and emerging standardization efforts;*
- *Follow ongoing European and international standardization efforts in the area of Prosperity4All. This includes, but is not limited to: ISO/IEC JTC1 SC35, ISO/IEC JTC1 SC36, W3C WAI Protocols and Formats, ISO/IEC JTC1 Special Working Group on Accessibility, openURC Alliance, European Mandate 376;*

¹ Prosperity4all DoW, version 2013-11-25, workplan table, work package 503

² A list of public deliverables is available at <http://www.prosperity4all.eu/outcomes/public-deliverables/>

- *Contribute to the development and maintenance of standards related to Prosperity4All, as a key condition of the growth of the market, through interoperability and availability of plug & play solutions coming from a large variety of vendors;*
- *Influence governments in the development and maintenance of consistent policies for the promotion of embedded accessibility solutions into mainstream ICT devices/applications.*

It is important to note that no project partner could do the work of standardization and concertation alone. For us to achieve our mission, we need many partners building and being integrated in various networks of standardization and collaboration. There are many areas in which we have to impact technology, and this is one of the reasons why Prosperity4All has so many partners.

2.2 Purpose of this deliverable

The DoW describes this deliverable briefly as follows:

D503.4) Standardization and Concertation Report: Including (1) a report on the extended network of external collaborators, key stakeholders and beneficiaries, and (2) a compendium of relevant standards and impact on Prosperity4All work.³

While the first purpose, "report on the extended network of external collaborators, key stakeholders and beneficiaries") fits well within the scope of WP503, the second purpose ("compendium of relevant standards and impact on Prosperity4All work") has already been worked on by WP202 in its deliverable D202.1 ("Report on repository standards, common interfaces and APIs"). Since D202.1 has already provided a list of standards that Prosperity4All has considered for take-up, and described how they related to the project's technological approaches, we focus on our active involvement in networks of collaboration and standardization in this deliverable (i.e. D503.4). Readers interested in already existing standards that have impacted the technological work of Prosperity4All, should read D202.1⁴, in particular its sections on:

- 3. Categorizing Functionality, Requirements and Preferences
- 4. Platform Level Accessibility
- 5. Web Accessibility
- 6. Realtime Messaging & Eventing

Standardization is a long-lasting task with sometimes only slow progress. The purpose of standardization is to look at various solutions for existing issues, and to find common ground

³ Prosperity4all DoW, version 2013-11-25, workplan table, work package 503

⁴ D202.1 is publicly available at <http://www.prosperity4all.eu/wp-content/uploads/P4A-D202.1-ReportOnRepositoryStandardsCommonInterfacesAndAPIs1st.pdf>

in compromises that need to be worked out. This requires time, often even beyond the lifetime of a research project. Therefore, this deliverable can only be a snapshot on how the Prosperity4All partners are currently involved in standardization and concertation activities. However, the public "GPII standardization roadmap" will be maintained to reflect the partners' actual activities with regard to standardization and concertation. See section 5 for more details on this.

2.3 The GPII standardization task force

Prosperity4All has established a task force on standardization, to coordinate the various standardization activities taking place within GPII. The task force maintains its own mailing list⁵ and a (public) section on the GPII Wiki⁶. Contents of this section include the GPII standardization roadmap (see section 5 of this deliverable), meeting minutes of the task force, a list of external collaborators and concertation actions, and references to GPII-related standards. The task force has met twice by web conference, on 2015-02-06⁷, and on 2015-07-07⁸.

In its meetings and through the mailing list, the members report about their activities in the various standardization committees, external collaborators and government related caucuses. The goal is to keep each other informed and to harmonize related activities.

Currently, the task force consists of the following persons:

- S. Baldiris Navarro, University of Girona, Spain
- Andy Heath, independent consultant, UK
- Steve Lee, OpenDirective, UK
- Matthias Peißner, Fraunhofer IAO, Germany
- Till Riedel, Karlsruhe Institute of Technology, Germany
- Madeleine Rothberg, WGBH, USA
- Joseph Scheuhammer, Inclusive Design Research Center, OCAD University, Canada
- Richard Schwerdtfeger, IBM, USA
- Alice Sinigaglia, AGE Platform, Belgium
- Lukas Smirek, Stuttgart Media University, Germany
- Jutta Treviranus, Inclusive Design Research Center, OCAD University, Canada
- Gregg Vanderheiden, RtF-Int'l

⁵ standardization@gpii.net

⁶ See https://wiki.gpii.net/w/Standardization_in_GPII

⁷ Minutes available at https://wiki.gpii.net/w/Standardization_Meeting_2015-02-06

⁸ Minutes available at https://wiki.gpii.net/w/Standardization_Meeting_2015-07-07

- Gottfried Zimmermann (convener of the task force), Stuttgart Media University, Germany

Most of the task force members have been active in standardization and/or collaboration platforms for years, before the start of Prosperity4All. This is an important aspect since standardization often depends on long-standing relationships between groups and persons.

2.4 (Scientific) Advisory Board

The Prosperity4All AB consists of independent experts, with very wide recognition in their respective fields, and with different backgrounds and areas of expertise, including needs/requirements of the users, technological trends and standards, ERA policies, legal issues, economic trends, etc. The Prosperity4All consortium has arranged that prestigious experts from all over the world participate in the SAB in order to ensure both the international impact of the project results, as well as conformance of the project results with international socio-economic trends.⁹

In its web conference meeting on 2015-03-18, Gottfried Zimmermann presented the GPII standardization roadmap (see section 5) to the Advisory Board.

⁹ Prosperity4all DoW, version 2013-11-25, section 2.1.5 Advisory Board (AB)

3 Goals of standardization and concertation

Prosperity4All's standardization and concertation approach has the following three top-level goals:

1. Reuse existing standards and technologies (in particular by mainstream), wherever possible.
2. Develop and validate new standards on GPII technologies, wherever necessary.
3. Work towards harmonization, adoption and inclusion of the GPII standards in standardization, industry, research and governments.

Every standardization activity in Prosperity4All should aim for one or more of these top-level goals.

3.1 Reuse existing standards and technologies

When we identify an area in our research and development work that is in need of a standardized solution, we first look at existing standards and technologies. It is important that we don't "re-invent the wheel" if it is already available. In some cases, we may have to "bend" the wheel a bit, but that is still better than having to create a new one.

Since we want to impact the mainstream market, we look at mainstream standards and technologies in the first place. If there is no mainstream solution available, we look at specialized areas such as the assistive technology market.

Reusing existing standards is economically sensible, and also provides a better chance for the GPII approach being adopted rather than building our "own island" with its own set of specialized standards.

Within GPII, we have adopted and reused a number of mainstream standards, such as the Extensible Markup Language (XML)¹⁰, the JavaScript Object Notation (JSON)¹¹, the WebSocket API¹², and HTTP for RESTful Web service interfaces¹³. For a more complete overview see GPII Wiki: Developer Space/Standards¹⁴.

¹⁰ <http://www.w3.org/XML/>

¹¹ <http://json.org/>

¹² <http://www.w3.org/TR/websockets/>

¹³ See chapter 5 in: Roy Thomas Fielding. (2000). *Architectural Styles and the Design of Network-based Software Architectures*. University of California, Irvine.

¹⁴ https://wiki.gpii.net/w/Developer_Space/Standards

3.2 Develop, validate and maintain core GPII standards

In a few cases, we have not found adequate existing standards to be re-used within GPII. Not surprisingly, this affects the core of GPII, i.e. about personal preferences, and about mechanisms to develop and instantiate user interfaces that have been specifically designed for being adaptive to personal preferences. Readers interested in a more detailed discussion of adaptive user interfaces and GPII's approach on this are referred to the HCII 2014 publication *Towards Deep Adaptivity – A Framework for the Development of Fully Context-Sensitive User Interfaces*¹⁵.

There are two international (multi-part) standards that are core to GPII and are currently being developed / revised with broad input from Prosperity4All and the GPII community:

- ISO/IEC 24751: Individualized adaptability and accessibility in e-learning, education and training (see section 5.4.1)
- ISO/IEC 24752: Universal Remote Console (see section 5.4.2)

We have chosen ISO/IEC as the appropriate place to publish these GPII core standards. With their Joint Technical Committee (JTC) 1, these two organizations are internationally recognized as "the authority" for normative standards on an international basis. However, the standardization rules of ISO with its various stages make the development of these standards a time-consuming and collaboration-intensive endeavour. Also, membership in ISO/IEC is based on national bodies, and requires that the standard authors work in "mirror committees" that belong to the corresponding national standardization organizations (cf. section 5.2). While this provides opportunities for dissemination of GPII and its technologies, it takes full commitment of the partners since members are usually required to review standards of other (peer) authors in addition to writing their own standards.

Based on these ISO/IEC standards, there are a number of implementation guidelines specifying how to implement them on specific implementation platforms. Since the Universal Remote Console standards need to have shorter turn-around times, and are more implementation-specific, we chose the openURC Alliance¹⁶ as the platform for development and publication. Another benefit is that all openURC standards are publicly available as Technical Reports¹⁷.

See chapter 5 for more information on these standards.

¹⁵ Zimmermann, G., Vanderheiden, G. C., & Strobbe, C. (2014). Towards Deep Adaptivity – A Framework for the Development of Fully Context-Sensitive User Interfaces. In C. Stephanidis & M. Antona (Eds.), *Universal Access in Human-Computer Interaction. Design and Development Methods for Universal Access* (pp. 299–310). Springer International Publishing. Retrieved from http://link.springer.com/chapter/10.1007/978-3-319-07437-5_29

¹⁶ www.openurc.org

¹⁷ www.openurc.org/TR

3.3 Work towards adoption of GPII standards in other standards and technologies

It is important to spread the word about GPII and its technologies to impact other standards, technologies, projects and communities. This is what we call "concertation". In many cases, concertation is not just a one-time effort but rather requires a long-term relationship and commitment to existing standardization groups and communities.

We need to explain the need for our technologies and standards, and help others to understand the benefits. We also need to work with them to harmonize their standards and technologies in an appropriate way, so that the resulting standards can be applied together with the GPII technology. Sometimes, it may even be possible to incorporate parts of the GPII technology in other standards or technologies.

In order to spread the word about the GPII technology and its benefits, Prosperity4All has supported its partners in giving presentations on various opportunities, including workshops and meetings of related standardization groups, projects and communities.

See chapter 5 for a list of these activities.

4 Overview of activities

This chapter provides an overview on GPII's activities related to standardization. Standardization is an important foundation for technological progress, interoperability and accessibility. In order to make the GPII technology available to everyone, we need to pollinate existing and emerging international standards with the seeds of personalized user interfaces based on personal preference sets.

While this chapter provides an overview of the GPII work on standardization and concertation, chapter 5 will go into the details of the individual standardization/concertation groups and the related outcomes that have been achieved or are expected.

4.1 Core standardization activities

The following aspects of GPII and Prosperity4All are regarded as core. None of the existing standards (except for ISO/IEC 24751 and ISO/IEC 24752) address them in a satisfactory manner (cf. section 4.2 below).

1. The specification of personal needs and preferences through functional descriptions rather than a person's medical characteristics.
2. The specification of a user's context when interacting with a product.
3. The specification of user interface resources through metadata so that they can be matched to a person's individual needs and preferences.
4. The ability to adapt a user interface at runtime to a user's needs and preferences and to a specific context by integration of matching user interface resources from various sources.

These aspects need to be standardized on an international level since the intended interoperability will be global.

The current revision of ISO/IEC 24751 (see section 5.4.1) with its three parts addresses the aspects #1-3 above. This work is done under ISO/IEC JTC1 SC 36 – Information technology for learning, education and training (see section 5.1.3).

The further development of ISO/IEC 24752 (see section 5.4.2) addresses aspect #4 above. This work is done under ISO/IEC JTC1 SC 35 – User Interfaces (see section 5.1.2).

4.2 Other relevant standards

There are a number of global standards that are related to **user interface personalization**, and have already been considered for building the GPII framework. However, none of them was found to be sufficient for fulfilling our requirements. For a list of standards related to

personalization, see section “Standards related to Personalization” on the GPII Wiki page “Compiling Existing Strategies and Tools”¹⁸.

Aside from standards that are specific to user preferences and personalization, there are many standards that are relevant for the development of the GPII framework and its **developer space** (“DSpace”)¹⁹. This has been the subject of the deliverable D202.1, Report on repository standards, common Interfaces and APIs²⁰. The GPII Wiki page “Developer Space/Standards”²¹ provides an overview on this deliverable.

4.3 Network of external collaborators

The Prosperity4All partners and other GPII collaborators maintain a large network of external collaborators. It is important for the success of the project and the whole GPII framework that we use this network to integrate and reach out to various stakeholders across multiple countries.

The building and maintenance of a strong network of collaborators has been in the focus of the project from the beginning.

*The network of collaborators already includes third-party organizations with strong and proven interest on the project’s results and will be further extended during the project lifetime. These organizations may endeavour to use the project’s results in the scope of products and services, as well as in the scope of other activities associated with their business strategies (e.g., standardization effort and policy making efforts). Hence, their participation in the project will result in a win-win situation for both the Prosperity4All project and the network of collaborators.*²²

In addition to the 10 external collaborators mentioned in the DoW (section 2.3.7), the GPII Wiki has a list²³ with 31 external collaborators in total that was compiled for the purpose of the Cloud4all project.

Prosperity4All will continue its networking activities, many of which will certainly outlive the project's lifetime.

¹⁸ https://wiki.gpii.net/w/Compiling_Existing_Strategies_and_Tools

¹⁹ GPII Developer Space, https://wiki.gpii.net/w/Developer_Space

²⁰ <http://www.prosperity4all.eu/wp-content/uploads/P4A-D202.1-ReportOnRepositoryStandardsCommonInterfacesAndAPIs1st.pdf>

²¹ https://wiki.gpii.net/w/Developer_Space/Standards

²² Prosperity4all DoW, version 2013-11-25, section 2.3.7

²³

https://wiki.gpii.net/w/Network_of_external_collaborators_and_concertation_actions#Existing_Network_of_External_Collaborators

5 Standardization roadmap

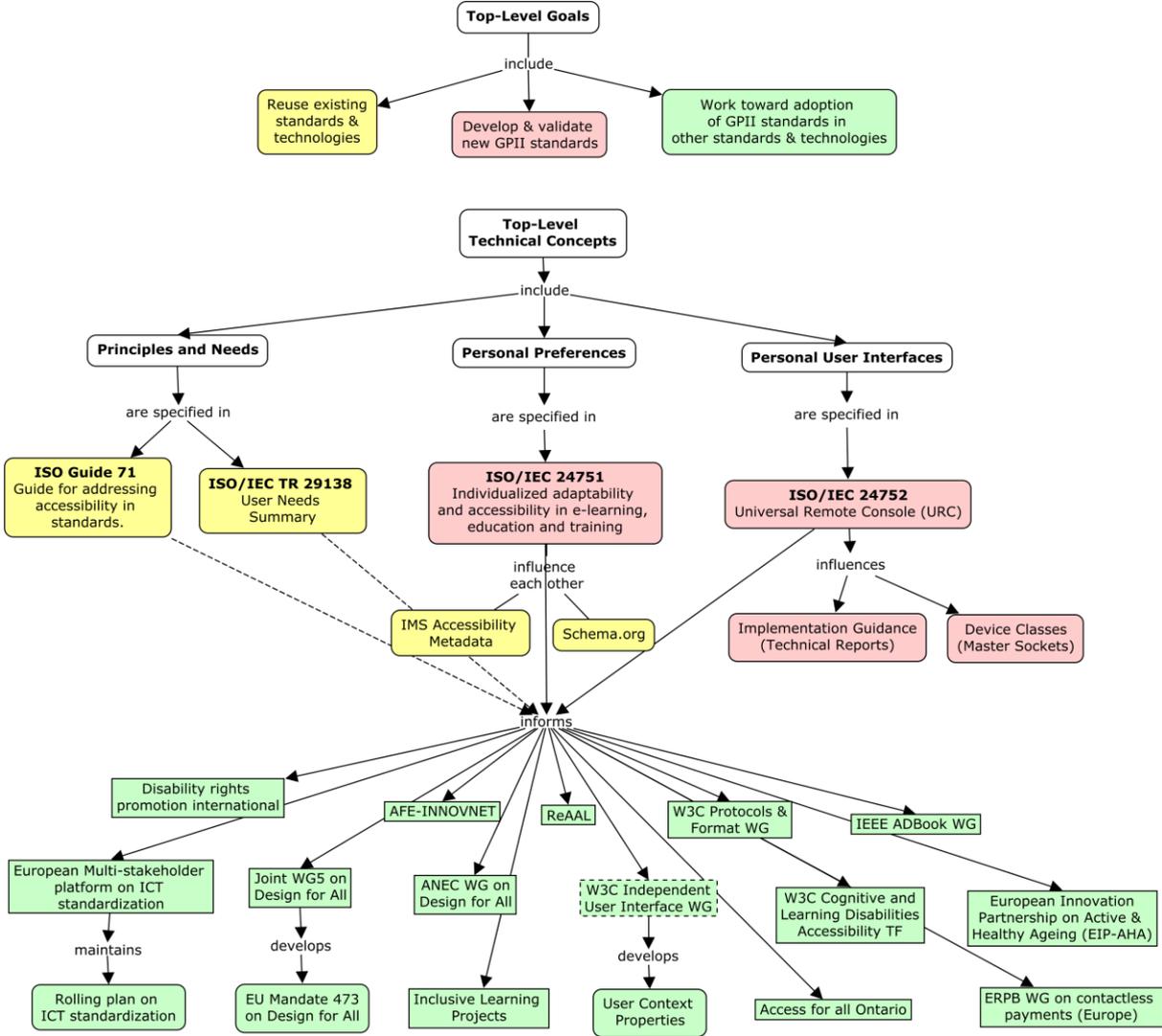
A standardization roadmap²⁴ has been created by the GPII Standardization task force (see section 2.3) and is publicly available as part of the GPII Wiki. It states the top-level goals of standardization within GPII (see chapter 3), and contains a plan for carrying out these plans through standardization and concertation activities. These activities are laid out as activities in international standardization groups (see section 5.1), national standardization groups (see section 5.2), within other projects and communities (see section 5.3), and expected outcomes in terms of standards and guidelines (see section 5.4).

The roadmap is constantly maintained to reflect the status of the GPII standardization activities. It is the central point of agenda for the task force meetings.

As an overview on the standardization roadmap, the following concept map illustrates the various topic areas, standards and standardization groups that GPII is working with, and how they relate to each other. Prosperity4All provides support for most of these activities within GPII.

²⁴ https://wiki.gpii.net/w/Standardization_Roadmap

Figure 2: Concept map of standardization and concertation activities in GPII and its network of external collaborators. Note for screenreader users: A textual description is attached to the image (tagged format).



Topics are presented as white rectangles with rounded corners, core GPII outcomes (standards and guidelines) as red rectangles with rounded corners, existing standards (that GPII reuses) as yellow rectangles with rounded corners, other related standards (to be informed by GPII) as green rectangles with rounded corners, and "external" standardization groups (to which GPII reaches out to) as green rectangles. This figure is also available online in graphical (PDF) format²⁵ and Text (DOCX) format²⁶.

²⁵ <https://wiki.gpii.net/w/File:GPII-StandardizationRoadmap.cmap.pdf>

²⁶ <https://wiki.gpii.net/w/File:GPII-StandardizationRoadmap.cmap.docx>

5.1 International standardization

GPII is involved in the following international standardization groups. For each group, we provide the following information: a short description in which the work of the group is related to the overall GPII work, the working modes of this group, the goals that GPII pursues within this group, a status update, and the partners and their roles leading the activity.

5.1.1 The IEEE Actionable Data Book (ADBook)²⁷

5.1.1.1 Description

This IEEE project is doing prototypical exploration of implementation aspects of the use of eBooks in connected environments using xAPI as a central store for fine granularity learner and other events (such as completion of exercises, assessments etc.) in using learning systems whose central delivery mechanism is the eBook. The R&D project is working with EPUB3 in co-ordination with IDPF and others. Alongside storage and retrieval of learner events the project aims to store, retrieve and adapt content/interface to accessibility preferences in the xAPI database. It offers the possibility to explore discovery of preferences analytically alongside learning analytics. It is expected to lead into standards work in IEEE when more advanced.

5.1.1.2 Modes of working

- Mailing lists
- Repository of drafts
- Weekly or twice-weekly telecons
- Participations in other groups and conferences
- Vendor and organization implementation support work

5.1.1.3 Goals for GPII

- Explore mobile learning implementation implications of preferences in the cloud and in ebooks

5.1.1.4 Status Update

There has been no progress in accessibility aspects recently.

²⁷ <https://ieeesa.centraldesktop.com/adb/>

5.1.1.5 Partners & roles

- Andy Heath (collaborator of Prosperity4All), is our liaison in the project.

5.1.2 ISO/IEC JTC1 SC35 – User Interfaces²⁸

5.1.2.1 Description

SC35 is the official government-driven committee for standardization of user interface related topics in ICT environments. This includes accessibility related standards in this area.

Most relevant working groups for GPII:

- WG4: User interfaces for mobile devices (convened by Dr. Yoshikazu Yamamoto)
- WG6: User interface accessibility (convened by Dr. Jim Carter)
- WG7: User interfaces objects, actions and attributes (convened by Dr. Jim Carter)
- WG8: User Interfaces for remote interactions (convened by Dr. Gottfried Zimmermann)
- An Ad-Hoc chaired by Dr. Jim Carter is currently revising the former SWG-A User Needs Summary (ISO/IEC 29138-1) to incorporate newly-identified user needs and devise an appropriate structure for categorization of needs as appears to be required to accommodate the new user needs.

5.1.2.2 Modes of working

- Mailing lists
- Document repository
- Electronic voting & commenting process through national bodies
- 2 plenary meetings per year, with working group meetings (full week)
- For the User Needs Ad-Hoc: email correspondence and irregular (approximately fortnightly) conference calls

5.1.2.3 Goals for GPII

- Develop ISO/IEC 24752, Universal Remote Console (see section 5.4.2) - WG8
- Impact the development of accessibility related standards - WG4, WG6, WG7
- Vote on accessibility related standards - SC35

²⁸

http://www.iso.org/iso/home/standards_development/list_of_iso_technical_committees/iso_technical_committee.htm?commid=45382

- Make sure a future User Needs Summary standard will be compatible with GPII. Potential mappings from User Needs to GPII preferences (not one to one) should satisfy personal needs in particular ICT contexts.

5.1.2.4 Status Update

- A revised version of ISO/IEC 24752 (4 parts revised) was published in Dec. 2014. This simplifies the application of URC.
- A new part 6 of ISO/IEC 24752 (titled "Web Service Integration") was published in Dec. 2014. This part specifies a method for making web services URC compatible via WSDL1 or WSDL2.
- New item proposals for new parts of 24752 on "RESTful Target Integration" and "User Interface Resource Framework" are currently being developed (see also section 5.4.2). WG8 has been informed about these plans in its last meeting in Jan. 2015 in Copenhagen, and provided positive feedback tentatively. In the next WG8 meeting, Sep. 2015 in Japan, appropriate formal new item proposals will be presented.
- The User Needs Summary standard (ISO/IEC 29138) is currently being revised by an Ad-Hoc.

5.1.2.5 Partners & roles

- HDM (Gottfried Zimmermann is a German delegate on SC35, convener of WG8, editor of ISO/IEC 24752, and liaison to SC36)
- Andy Heath (collaborator of Prosperity4All) is a British delegate on SC35. He is actively participating in the User Needs Ad-Hoc.

5.1.3 ISO/IEC JTC1 SC36 – Information technology for learning, education and training²⁹

5.1.3.1 Description

ISO/IEC JTC 1/SC 36 develops international standards for information technologies (IT) used in Learning, Education and Training (LET). A key goal of SC36 standards is to provide for interoperability among different and distributed IT systems, tools and services used in LET contexts.

²⁹

http://www.iso.org/iso/home/standards_development/list_of_iso_technical_committees/iso_technical_comm_itee.htm?commid=45392

5.1.3.2 Modes of working

- Mailing lists
- Document repository
- Electronic voting & commenting process through national bodies
- 1 plenary meeting per year, with working group meetings (full week)
- email correspondence and occasional conference calls

5.1.3.3 Goals for GPII

- Develop ISO/IEC 24751, Individualized adaptability and accessibility in e-learning, education and training (see section 5.4.1).

Note: ISO/IEC 24751 existed prior to the GPII, and was a major catalyst for the GPII approach („one size fits one accessibility“). However, the current version of ISO/IEC 24751 (released in 2008) has some drawbacks that make it difficult to understand and to apply. Therefore, after GPII was founded, it has been participating in a further revision to the standard that is ongoing and changing it from a fixed standard into a registry standard – which the GPII is then implementing as its Preference Terms Dictionary (previously the Common Terms Registry).

5.1.3.4 Status Update

- A Committee Draft (CD) of *ISO/IEC 24751 Part 1 – Framework* was submitted for comment fall 2014. Comments were reviewed at the Working Group meeting in June, 2015 and a second CD will be submitted in December, 2015
- *ISO/IEC 24751 Part 2 – Need and Preference Term Registry* will be revised and re-submitted as a new project in 2016
- *ISO/IEC 24751 Part 3 – Core Terms* will be revised and re-submitted as a new project in 2016

5.1.3.5 Partners & roles

- Anastasia Cheetham, IDRC, is convenor of WG7 on Accessibility.
- Jutta Treviranus, IDRC, is an active member of WG7.
- Andy Heath, collaborator of GPII, is an active member of WG7.
- Gregg Vanderheiden, RtF-Int'l, is an active member of WG7.
- Gottfried Zimmermann, HDM, is an active member of WG7.

5.1.4 IMS Accessibility Metadata Working Group³⁰

5.1.4.1 Description

The IMS Accessibility project Working Group focuses on adaptation or personalization of resources, interfaces and content to meet the needs of individuals. The group believes that the best way to make a system or resource accessible to an individual is by meeting that individual's particular needs at that time in that context. Within the Accessibility Metadata project³¹, this working group creates IMS specifications and strives to stay harmonized with other groups working on accessibility metadata and preferences.

5.1.4.2 Modes of working

- Mailing lists
- Repository of standards and drafts
- Weekly telecons
- Occasional face-to-face meetings

5.1.4.3 Goals for GPII

- Create properties and vocabulary for accessibility metadata and preferences that are compatible to the GPII framework.

5.1.4.4 Status Update

- IMS Access for All v3³² is in public draft.
- Schema.org Accessibility Metadata was based on this version; some changes made in the schema.org working group will be incorporated in the next release.
- The next release will also incorporate accessibility preferences for assessment, currently specified in IMS' Accessible Portable Item Protocol® (APIP®)³³. No timeline is currently available for that release.

5.1.4.5 Partners & roles

- Madeleine Rothberg, collaborator of GPII, and Anastasia Cheetham, Inclusive Design Research Centre (IDRC), are active members of the IMS Accessibility project group, and are contributors of some draft IMS Access for All (AfA) 3.0 specifications.

³⁰ <http://www.imsglobal.org/accessibility/>

³¹ <http://a11ymetadata.imsglobal.org/>

³² <http://www.imsglobal.org/accessibility/>

³³ <http://www.imsglobal.org/apip/index.html>

- Andy Heath, collaborator of Prosperity4All, is an active members of the IMS Accessibility project group, and is contributor of some draft IMS Access for All (AfA) 3.0 specifications.

5.1.5 openURC Alliance³⁴

5.1.5.1 Description

openURC's mission is to promote the Universal Remote Console (URC) and associated standards and its application.

While ISO/IEC 24752 is the conceptual basis for URC, openURC's Technical Committee (TC) develops implementation guidance for specific URC technologies in the form of Technical Reports (e.g. the Universal Control Hub).

5.1.5.2 Modes of working

- Mailing lists
- Repository of standards and drafts
- Technical Committee has monthly telecons
- Board of Directors has telecons on demand
- Executive Committee has telecons on demand
- One plenary meeting per year

5.1.5.3 Goals for GPII

- Further develop the URC technology to meet the technical needs of personalized user interfaces.
- Make sure URC is compatible with other GPII technologies.

5.1.5.4 Status Update

The Resource Server HTTP Interface 1.0 specification³⁵ was released as Approved Technical Report on 2014-03-04. With it, user interfaces can adapt to a user's personal needs and preferences by downloading appropriate user interface resources at runtime from a resource server.

³⁴ www.openurc.org

³⁵ <http://www.openurc.org/TR/res-serv-http1.0-20140304/>

The URC-HTTP Target 1.0 specification³⁶ was released on 2015-02-05 as Approved Technical Report. With it, targets can easily conform to URC by implementing the URC-HTTP protocol which can be called from web clients via AJAX.

Work is progressing on the development of tutorials and URC device templates for developers who want to conform to the openURC standards and guidelines. Some of the tutorials have already been published on the openURC Website³⁷. This work belongs to T202.4 and T301.4, but is mentioned here because it relates to standardization.

5.1.5.5 Partners & roles

- Gottfried Zimmermann, HDM, is vice-president of openURC, and chair of the Technical Committee.
- Lukas Smirek, HDM, is a member of the Technical Committee.

5.1.6 Schema.org³⁸

5.1.6.1 Description

Accessibility metadata for Schema.org was developed by the Accessibility Metadata Project³⁹, led by Benetech. A version 1 metadata model was adopted by Schema.org and is documented on the WebSchemas/Accessibility page⁴⁰. Discussion of an update to the schema is beginning (as of March 2015).

5.1.6.2 Modes of working

- Mailing list
- Occasional telecons

5.1.6.3 Goals for GPII

- Create properties and vocabulary for accessibility metadata (used by search engines) that are compatible to the GPII framework.
- Work towards implementation in mainstream search engines.

³⁶ <http://www.openurc.org/TR/urhttp-target1.0-20150205/>

³⁷ <http://www.openurc.org/tutorials/index.html>

³⁸ <http://schema.org/>

³⁹ <http://www.a11ymetadata.org/>

⁴⁰ <http://www.w3.org/wiki/WebSchemas/Accessibility>

5.1.6.4 Status Update

- Schema.org adopted the accessibility metadata version 1.0 with four properties. See the Accessibility Metadata Specification⁴¹.
- No vendors have announced how this will be implemented as filter mechanisms in the search engines.
- Currently available with Google custom search. For example, with a custom search engine for alternative text⁴², you can enter a search term and find books that offer alternative text. For best results, use a general search term like "tree" or "water." Results are a bit unpredictable.
- Accessibility metadata for captions is added automatically for users of the WordPress YouTube Plug-in WP YouTube Lyte⁴³ when their video is captioned. This has resulted in huge numbers of videos from all over the world including the metadata for captions.
- Accessibility Metadata has also been published by these organizations: Kahn Academy, Bookshare, Hathi Trust, the Open Library Initiative, the Learning Registry, Yahoo!, YouDescribe, and the Francophone accessible digital library, La Bibliothèque Numérique Francophone Accessible.
- Future work could include access mode for describing aspects of the main resource. Access Mode has been implemented as defined by IMS Access for All for many years, but in the search engine context, the proper definition has not been determined. More accessibility features could also be added as needed.

5.1.6.5 Partners & roles

- Jutta Treviranus and Anastasia Cheetham, IDRC.
- Madeleine Rothberg, GPII collaborator (financial support for this project by Benetech, Gates Foundation).
- Work on schema.org was funded by the Bill & Melinda Gates foundation in a grant to Benetech, and carried out by Benetech staff and volunteers from a number of organizations.

⁴¹ <http://www.a11ymetadata.org/the-specification/>

⁴² https://cse.google.com/cse/publicurl?cx=004555001515836219587:_ov0shbdajk

⁴³ <https://wordpress.org/plugins/wp-youtube-lyte/>

5.1.7 W3C Protocols and Formats (PF) Working Group⁴⁴

5.1.7.1 Description

The Protocols and Formats (PF) working group looks at the formal Web technologies (protocols, formats, etc.) from an accessibility perspective. The principal output of this working group is feedback to other W3C working groups developing specification, on how to ensure that their work can allow for accessibility.

Aside from regular reviews on W3C standards under development, the PF working groups has developed a set of standards⁴⁵, including those on ARIA (Accessible Rich Internet Applications)⁴⁶.

5.1.7.2 Modes of working

- Mailing lists
- Repository of standards and drafts
- Weekly telecons
- 2 face-to-face meetings per year

5.1.7.3 Goals for GPII

- Identify current trends in Web technologies (e.g. Web components), and their potentials/risks for GPII.
- Impact the development of W3C standards to be GPII compatible.
- Promote GPII concepts within the W3C community.

5.1.7.4 Status Update

The review activity for other emerging W3C standards helps us to stay informed about the standards landscape on web platforms, and to look for synergies and harmonization opportunities with the GPII work.

In a review on the NFC API draft, Gottfried Zimmermann pointed the authors to a possible use case for this technology, that is to let a user provide their personal preference set to a public device or service via NFC.⁴⁷

⁴⁴ <http://www.w3.org/WAI/PF/>

⁴⁵ <http://www.w3.org/WAI/PF/#pubs>

⁴⁶ <http://www.w3.org/TR/wai-aria/>

⁴⁷ <https://lists.w3.org/Archives/Member/w3c-wai-pf/2014JanMar/0157.html> (members-only link)

5.1.7.5 Partners & roles

- Gottfried Zimmermann, HDM, is an invited expert in the working group.
- Joseph Scheuhammer, IDRC, is an invited expert in the working group.

5.1.8 W3C Independent User Interface (IndieUI) Working group⁴⁸

5.1.8.1 Description

The IndieUI working group has worked on two linked specifications, which, when used together, can support adaptation to User Context (accessibility preferences) on mobile devices. The two specifications are: Events 1.0⁴⁹ and User Context 1.0⁵⁰. The Events specification provides an intermediate layer between device- and modality-specific user interaction events, and the basic user interface functionality used by web applications. The User Context specification provides a set of individual preferences designed to work with the Events model supporting the adaptation of interface AND content to the preferences taking account of the device capabilities. Use cases include searching for appropriate content and configuring the device, particularly via providing an abstract way that web technologies can determine what has been requested.

5.1.8.2 Modes of working

- Mailing lists
- Repository of standards and drafts
- Fortnightly telecons and accompanying IRC
- 1 face-to-face meeting per year

5.1.8.3 Goals for GPII

- Make sure that both specifications can work on a GPII-enabled platform.
- Maximize compatibility between a user's settings, as defined by the User Context specification, and user preference terms, as defined by GPII (via the ISO/IEC 24751 registry).

⁴⁸ <http://www.w3.org/WAI/IndieUI/Overview.html>

⁴⁹ <http://www.w3.org/TR/indie-ui-events/>, latest editor's draft at: <https://dvcs.w3.org/hg/IndieUI/raw-file/default/src/indie-ui-events.html>

⁵⁰ <http://www.w3.org/TR/indie-ui-context/>, latest editor's draft at: <https://dvcs.w3.org/hg/IndieUI/raw-file/default/src/indie-ui-context.html>

5.1.8.4 Status Update

The Events 1.0 specification is at W3C Working Draft 1.0.

The User Context 1.0 specification is between First Public Working Draft and W3C Working Draft.

- Some of the schema.org properties are included.
- Still some work needed on properties.
- Issue with content-related preferences: If every platform stores the user's preferences in their own cloud, a user's profile will exist multiple times (in different versions) in multiple clouds. Possible solution: Business model of new content, in particular for regulated markets (government, education).

The W3C charter for this work has now expired, and the working group's work is currently being moved to other groups, including a User Context component within ARIA 2.0 as described in the draft ARIA charter⁵¹, and other components in a newly-forming group.

Note: In the concept map at the beginning of this chapter, the Independent User Interface working group is depicted with a dashed outline, due to its expired status.

5.1.8.5 Partners & roles

- Andy Heath (collaborator of Prosperity4All), is an invited expert in the working group.
- Joseph Scheuhammer, IDRC, is an invited expert in the Indie UI working group.

5.1.9 W3C Cognitive and Learning Disabilities Accessibility Task Force⁵²

5.1.9.1 Description

The objective of the Cognitive and Learning Disabilities Accessibility Task Force is to improve Web accessibility for people with cognitive and learning disabilities. This will begin with research and gap analysis. Then the group will develop draft proposed guidance and techniques to make web content, content authoring, and user agent implementation accessible and more useable by people with cognitive and learning disabilities. It will also review existing techniques and consider ways to improve them, and build new techniques where necessary. The Cog a11y TF is a joint Task Force of the Protocols and Formats Working Group (PFWG) and the Web Content Accessibility Guidelines Working Group (WCAG WG). It assists these Working Groups to produce techniques, understanding, and guidance

⁵¹ <http://www.w3.org/2015/04/draft-aria-charter>

⁵² <https://www.w3.org/WAI/PF/cognitive-a11y-tf/>

documents, as well as updates to existing related W3C material that addresses the cognitive space.

5.1.9.2 Modes of working

- Mailing list
- Wiki and GitHub
- Issue Tracker
- Polls
- IRC - #coga IRC channel
- Weekly teleconferences
- Regular updates to the PFWG and WCAG WG
- Regular deliverables to the WCAG WG and UAWG for approval

5.1.9.3 Goals for GPII

- Influence main W3C accessibility activities.
- Inform Prosperity4All's T203.4 framework for guidelines and starting frameworks for low cognitive and stepping stone applications for low digital literacy.
- Ditto T301.2: Improving access to technology for dementia sufferers/carer.

5.1.9.4 Status Update

A public working draft of Cognitive Accessibility User Research⁵³ was released on 2015-01-15. This is the first publication and work is now focusing on further identifying user issues and creating issue papers to explain them. This then informs a gap analysis between the issues and the current state of the art. For example, areas such as graded help and personalization are being addressed and will feed into GPII activities.

There has been discussion on how the task force's work fits in with other existing standards and GPII activities such as the Preference Terms Registry. The consensus is that GPII will easily embrace the task force's activity and it can work more closely with GPII once it has gathered more analysis.

5.1.9.5 Partners & roles

- Steve Lee, OpenDirective, is an invited expert in the task force.

⁵³ <http://www.w3.org/TR/2015/WD-coga-user-research-20150115/>

5.2 National standardization

For many international standardization groups, it is necessary to be an active member on the corresponding national mirror committee. This provides an additional opportunity for raising awareness for GPII technologies among national experts, and to have an impact on the development of national standards, guidelines and policies (including legislation).

5.2.1 DIN NA 023-00-02 GA Accessibility⁵⁴

The "Joint working committee of Ergonomics Standards Committee/Information Technology and selected IT Applications Standards Committee: Accessible design/Accessibility" is the German national standardization committee on accessibility.

GPII's goal in this committee are to impact the development of accessibility related standards (national and by international committees that are mirrored) to be compatible to GPII.

Gottfried Zimmermann, HDM, is an active member in this committee.

5.2.2 DIN NA 023-00-04 GA Ergonomics for information processing systems⁵⁵

The "Joint working committee NAErg/NIA: Ergonomics for information processing systems" is the German national standardization committee on ergonomics.

GPII's goals in this committee is to participate on the German delegation of ISO/IEC JTC1 SC35, and to impact the development of national usability related standards.

Gottfried Zimmermann, HDM, is an active member in this committee.

5.2.3 DIN NA 023-00-04-09 AK Ergonomic aspects of AAL and assistive systems⁵⁶

The DIN committee on "Ergonomic aspects of AAL (ambient assisted living) and assistive systems" is German's national standardization committee on accessibility issues in the area of Ambient Assisted Living (AAL).

GPII's goal in this committee is to impact the development of national accessibility related standards in AAL to be compatible to GPII, and to raise awareness for GPII technologies in national AAL projects.

⁵⁴ <http://www.naerg.din.de/gremien/NA+023-00-02+GA/en/76739119.html>

⁵⁵ <http://www.naerg.din.de/gremien/NA+023-00-04+GA/en/90801861.html>

⁵⁶ <http://www.nam.din.de/cmd?level=tpl-untergremium-home&languageid=en&subcommitteeid=197515973>

Gottfried Zimmermann and Alexander Henka, HDM, are active members in this committee.

5.2.4 DIN NA 043-01-36 AA Learning Technologies⁵⁷

The DIN committee on "learning technologies" is German's national standardization committee on eLearning.

GPII's goal in this committee is to participate on the German delegation in ISO/IEC JTC1 SC36, and to raise awareness for GPII technologies in national eLearning projects.

Gottfried Zimmermann, HDM, is an active member in this committee.

5.3 Cooperation and concertation activities

Less formal cooperation and concertation activities in networks of projects and stakeholders are a valuable supplement to our work in standardization groups, and will often pave the way for standardization or quasi-standardization.

5.3.1 Access for all Ontario

The Province of Ontario is implementing AccessForAll in the training portal and workstation setup for 65,000 employees.

GPII's goal in this project is to establish a large-scale implementation exemplar of matching personal optimization using Access4All.

IDRC is a partner in this project.

5.3.2 AFE-INNOVNET⁵⁸ - Towards an Age-Friendly Europe

AFE-INNOVNET is a European project/platform that aims at mobilising a EU-wide community of local and regional authorities and other stakeholders to support the scaling-up of innovative solutions for age-friendly environments to support active and healthy ageing across Europe.

GPII's goal in this platform is to listen in to actual trends and developments in AAL, and to use opportunities for cooperation and spreading GPII technologies.

AGE Platform, a Prosperity4All partner, is coordinator of AFE-INNOVNET. Alice Sinigaglia, AGE Platform, and Gottfried Zimmermann, HDM, are members of the platform.

⁵⁷ <http://www.nia.din.de/gremien/NA+043-01-36+AA/en/54777452.html>

⁵⁸ <http://www.afeinnovnet.eu/>

5.3.3 ANEC Working Group on Design for All⁵⁹

The ANEC Design for All Working Group unites experts from both the consumer movement and the disability/elderly organizations. Its work is based on the ANEC Policy Statement on Design for All. In addition, ANEC initiated or participated in various activities in the European and international standards bodies on this issue. These include most notably the EC Mandate 473, Standardization Mandate to include Design for All in relevant standardization activities.

GPII's goals in this working group are to listen in to actual developments in various activities in the European and international standards bodies on the topic of Design for All, to use opportunities for future projects and spreading GPII technologies, and to provide input to ANEC activities in the European and international standards bodies.

Alice Sinigaglia, AGE Platform, is a member of the working group.

5.3.4 Disability Rights Promotion International (DRPI)⁶⁰

DRPI aims at establishing a monitoring system to address disability discrimination globally. DRPI offers training in disability rights monitoring and is utilizing AccessForAll in the training and information site.

GPII's goal in this project is to provide an implementation exemplar of matching resources to personal preferences using the AccessForAll mechanism.

IDRC is involved in this project.

5.3.5 ERPB Working Group on Mobile and Card Based Contactless Proximity Payments⁶¹

The Working Group on Mobile and Card Based Contactless Proximity Payments received its mandate from the Euro Retail Payments Board (ERPB) in December 2014. The focus of the ERPB WG is on innovative payment solutions that rely on contactless technologies to initiate payments or transfer payment related data in proximity payment situations. The aim is to develop a report to the ERPB which contains a concrete action plan to achieve the essential conditions in the cooperative space for the realisation of a vision for mobile and card based contactless proximity payments by November 2015.

⁵⁹ <http://www.anec.org/anec.asp?p=design-for-all&ref=01-01.02-01&ID=8>

⁶⁰ <http://drpi.research.yorku.ca/>

⁶¹ https://www.ecb.europa.eu/paym/retpaym/shared/pdf/2nd_eprb_meeting_item1.pdf?b70bbb40c47214b15692369b71765d2b

GPII's goal in this working group is to listen in to actual developments in the field of contactless payments, and to provide input to the activities of the group.

Alice Sinigaglia, AGE Platform Europe, is a member of the working group.

5.3.6 European Innovation Partnership on Active and Healthy Ageing (EIP-AHA)⁶²

EIP-AHA is a communication and information platform for all actors involved in Active and Healthy Ageing throughout Europe; the place to promote news and events, to meet and exchange ideas with peers and potential partners on innovative projects in this challenging field. EIP-AHA has a number of action groups in which work is conducted. The most relevant for GPII are: Action Group C2⁶³ on the development of interoperable independent living solutions, including guidelines for business models; and Action Group D4⁶⁴ on innovation for age friendly buildings, cities and environments.

GPII's goals on this platform are to listen in to actual trends and developments in AAL and Active and Healthy Ageing; to impact upcoming AAL-related calls for proposals by the European Commission to be GPII and accessibility friendly; and to use opportunities for future projects and spreading GPII technologies.

Gottfried Zimmermann, HDM, gave a presentation titled "URC/GPII Building Blocks for an AAL Integration Platform" on 2014-05-05 at the EIP-AHA C2 Workshop in Berlin, Germany. This was to make the C2 Action Group aware of the GPII concepts, and to help to make future AAL technologies compatible with GPII.

Gottfried Zimmermann, HDM, is an active member of the C2 coordination group. Anne-Sophie Parent and Julia Wadoux, AGE Platform Europe, are coordinators of the D4 action group.

5.3.7 European Multistakeholder Platform (MSP) on ICT Standardization⁶⁵

MSP is based on a European Commission Decision to advise on matters related to the implementation of ICT standardization policies. Its work focuses on:

- potential future ICT standardization needs in support of European legislation, policies and public procurement;
- technical specifications for public procurements, developed by global ICT standards-developing organizations;

⁶² <https://webgate.ec.europa.eu/eipaha/>

⁶³ <https://webgate.ec.europa.eu/eipaha/actiongroup/index/c2>

⁶⁴ <https://webgate.ec.europa.eu/eipaha/actiongroup/index/d4>

⁶⁵ <http://ec.europa.eu/digital-agenda/en/european-multi-stakeholder-platform-ict-standardisation>

- cooperation between ICT standards-setting organizations.

The MSP is composed of representatives of national authorities from EU Member States & EFTA countries, by the European and international ICT standardization bodies, and by stakeholder organizations that represent industry, small and medium-sized enterprises and consumers. It is co-chaired by the European Commission Directorates General Enterprise and Industry, and CONNECT. It meets four times per year.

GPII's goals in MSP are:

- Listen in to actual trends and developments in the field of ICT standardization and relevant EU policies and projects.
- Impact the update of the Rolling Plan on ICT standardization⁶⁶. The document lists all the topics identified as EU policy priorities where standardization, standards, or ICT technical specifications ought to play a key role in the implementation of the policy. It covers technologies of 'horizontal importance', ones whose application have a wide impact across different technical fields, in the context of ICT infrastructures and ICT standardization.

Alice Sinigaglia, AGE Platform Europe, is a member of MSP.

5.3.8 Inclusive Learning Project⁶⁷

The Inclusive Learning Project (Supporting Trainers for an Inclusive Vocational Education and Training) aims to provide to Vocational Education and Training (VET) institutions with a solution for related inclusion problems (addressing the Lifelong Learning Program priorities).

GPII's goal in this project is to provide an implementation exemplar of matching resources to personal preferences using the AccessForAll mechanism.

IDRC is a partner in this project consortium.

5.3.9 MOOC Accessibility Partnership (MOOCAP)⁶⁸

This ERASMUS+ Strategic Partnership develops a set of MOOC and online courses on accessible design in ICT. The partnership consists of 9 European universities with excellence in accessibility research and teaching.

GPII's goal is to include GPII concepts and technologies in the set of the online courses so that professionals learn about the GPII framework and its opportunities.

⁶⁶ <https://ec.europa.eu/digital-agenda/en/rolling-plan-ict-standardisation>

⁶⁷ <http://www.inclusive-learning.eu/>

⁶⁸ <http://gpii.eu/moocap>

Gottfried Zimmermann, HDM, is coordinator of MOOCAP.

5.3.10 Preferences for Global Access⁶⁹

The goal of this project is the design and development of web software to assist users with disabilities in creating online user profiles that specify their needs and preferences for how online information and services should be presented to them. This team is developing tools and technologies to support users in specifying their individual needs and preferences in several application settings.

This is another core project of GPII. It fills the gap in the GPII framework on how users can create and maintain their individual sets of personal preferences.

RtF-I and IDRC are partners in the project consortium.

5.3.11 ReAAL⁷⁰

ReAAL is a European-funded project for pilot-testing the AAL technology developed by universAAL⁷¹. Although ReAAL uses its own platform and technology, there have been occasional workshops for the purpose of exchanging concepts, and to learn from each other.

Gottfried Zimmermann, HDM, has presented on some workshops together with people from ReAAL (most recently at the Summit on Active and Healthy Ageing in Brussels, March 2015).

5.4 Main Outcomes

In this section, the main outcomes in terms of standards and guidelines for the GPII framework are described, as achieved mainly through the international standardization activities (see section 5.1).

5.4.1 ISO/IEC 24751 – Individualized adaptability and accessibility in e-learning, education and training

5.4.1.1 Description

ISO/IEC 24751 currently consists of the following parts:

- Part 1: Framework. This part provides an introduction to the overall framework, and its design concepts.

⁶⁹ <http://www.iskme.org/our-work/preferences-global-access>

⁷⁰ <http://www.cip-reaal.eu/>

⁷¹ <http://www.universaal.org/>

- Part 2: Need and Preference Terms Registration. This part specifies how preference terms can be registered and the processes that are needed for this.
- Part 3: Core Application Profile. This part specifies a core set of metadata terms for the description of resources.

All three parts are currently being revised within ISO/IEC JTC1 SC36 on Information technology for learning, education and training (see section 5.1.3), in particular its Working Group 7 on culture, language and individual needs.

5.4.1.2 Relevance for GPII

The revision is needed to make the standard conforming to the concepts of the GPII framework, including:

- A registry approach for the definition of terms for personal preferences.
- A registry approach for the definition of terms for describing contexts.
- A simple language with a set of operators for building complex statements involving personal preference terms and context terms.
- A defined approach for the definition of terms for describing resources.

5.4.1.3 Contributing committees

- ISO/IEC JTC1 SC36 (see section 5.1.3)
- DIN NA 043-01-36 AA (see section 5.2.4)

5.4.1.4 Partners & roles

- Jutta Treviranus, IDRC, is lead editor for parts 1 and 2
- Andy Heath, collaborator of GPII, is co-editor

5.4.2 ISO/IEC 24752 – Universal Remote Console (URC)

5.4.2.1 Description

The ISO/IEC 24752 standards specify the basic concepts and document formats for the Universal Remote Console ecosystem. In its second edition, the URC technology has been revised based on lessons learned to be simpler to implement and based on current technologies.

ISO/IEC 24752 currently consists of the following parts:

- Part 1: Framework (2nd edition)
- Part 2: User interface socket description (2nd edition)
- Part 3: User Interface Template
- Part 4: Target description (2nd edition)

- Part 5: Resource description (2nd edition)
- Part 6: Web service integration

Notes:

- The second editions of parts 1, 2, 4 and 5 were released as International Standards in Dec. 2014. With the revision, the URC technology was made easier to implement.
- Part 6 was also released as International Standards in Dec. 2014. It defines a way for devices/services to expose themselves as SOAP-based Web services in a URC-compliant way.
- Part 3 is obsolete will be withdrawn in the near future.

ISO/IEC 24752 was developed by ISO/IEC SC35 on user interfaces (see section 5.1.1), in particular its working group 8 on remote user interaction.

It is planned to add two new parts to ISO/IEC 24752:

- RESTful target integration. This new part is planned to specify an alternative way of implementing URC-compliant targets as RESTful Web services. This is more lightweight than implementing a target as SOAP-based service (cf. part 6). Also, Web applications can directly connect to RESTful targets.
- User interface resource framework. This new part is planned to specify a framework for Web and other clients to query and retrieve supplemental user interface components from a resource server via a RESTful protocol. This part will include a specification of metadata for describing supplemental user interface components, and a specification of the RESTful protocol for querying and retrieval.

5.4.2.2 Relevance for GPII

The URC technology is part of the GPII concepts. Through its separation of frontend and backend, it allows for pluggable user interfaces that may be provided by the manufacturer of a device or by third parties. In the smart home and AAL contexts, URC is a basic technological concept for auto-personalization by preferences.

Relevance of the new part on RESTful target integration: RESTful Web interfaces have become the de-facto standard in today's heterogeneous distributed systems. GPII's architecture builds upon REST.

Relevance of the new part on user interface resource framework: Applications using the GPII framework need a way to load user interface resources at runtime that match to a user's personal needs and preferences. Web and other clients will be able to do so via communication with a resource server through this new RESTful protocol.

5.4.2.3 Contributing committees

- ISO/IEC JTC1 SC35 (see section 5.1.1)
- DIN NA 023-00-04 GA (see section 5.2.2)
- openURC Alliance (see section 5.1.5)

5.4.2.4 Partners & roles

- Gottfried Zimmermann, HDM, is editor of all existing parts of ISO/IEC 24752

5.4.3 Device Templates for URC-Compliant Targets

5.4.3.1 Description

Device templates are tools for vendors of devices and services (called "targets") that allows them to make their targets compatible with the URC framework easily.

A set of device templates consists of the following documents:

- Target description template
- Socket description template
- Grouping sheet template
- Resource sheet template
- Optional: WSDL1 and WSDL2 documents

Device templates will be made available publicly by the openURC Alliance through its Technical Reports index page⁷².

5.4.3.2 Relevance for GPII

Device templates are strongly needed for interoperability of pluggable user interfaces across device models. Device manufacturers can use the appropriate templates as a basis for their products. With the new inheritance feature (see ISO/IEC 24752-2:2014) user interface sockets can be easily extended for product-specific additions. However, the pluggable user interfaces for the device template can still be used for the extended product (albeit hiding the additional features).

By providing these templates to vendors, their effort for making their products URC- and GPII-compatible is significantly decreased.

⁷² <http://www.openurc.org/TR>

5.4.3.3 Contributing committees

- openURC Alliance (see section 5.1.5)

5.4.3.4 Partners & roles

- Lukas Smirek, HDM, is editor of multiple device templates (under development)

6 Conclusion & Outlook

This document provides an overview of the various standardization and concertation activities of Prosperity4All.

In an ideal world, design, implementation and standardization should go hand in hand. However, due to the long development processes of standardization (in particular on an international level), standardization is somewhat lagging behind for GPII technologies. However, this is better than standardizing unproven technologies and concepts.

The Prosperity4All partners will continue their efforts in making the GPII technologies available to other projects, and to the global market, by standardization and concertation activities. As another result of these activities, Prosperity4All will issue a set of application guidelines, policy and standards recommendations (D503.5) by the end of the project.

This task [T503.3] will also propose a set of guidelines valid for the applications considered in the project and applicable also to new applications and mainstream ICT devices. These guidelines will provide best practices associated with the role and responsibilities of all stakeholders in the design, development and deployment of accessibility solutions.⁷³

⁷³ Prosperity4all DoW, version 2013-11-25, workplan table, work package 503

Annex I: Glossary

Abbreviation	Full form
AAL	Ambient Assisted Living
AB	Advisory Board (aka "Scientific Advisory Board")
AFE-INNOVNET	Innovation for age-friendly environments
AoD	Assistance on Demand
ANEC	European Association for the Co-ordination of Consumer Representation in Standardisation
API	Application Program Interface
AT	Assistive Technology
D	Deliverable
DoW	DoW
Dspace	DeveloperSpace
ERA	European Research Area
GPII	Global Public Inclusive Infrastructure
HCI	Human-Computer Interaction International
HTTP	Hypertext transfer protocol
ICT	Information and Communications Technology
IDE	Integrated Development Environment
IEC	International Engineering Consortium
IEEE	Institute of Electrical and Electronics Engineer
IMS	Instructional Management Systems
ISO	International Organization for Standardization
IT	Information Technology
JSON	JavaScript Object Notation
JTC	Joint Technical Committee
LET	Learning, Education and Training
MSP	Multistakeholder Platform

Abbreviation	Full form
R&D	Research and Development
REST	Representational State Transfer
SAB	Scientific Advisory Board (aka "Advisory Board")
SP	Sub-Project
UI	User Interface
URC	Universal Remote Console
W3C	World Wide Web Consortium
WP	Work Package
XML	Extensible Markup Language