



DELIVERABLE

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D5.2: Scalability to the

European Innovation Partnership for Active and Health Ageing

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Statement of originality

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Abbreviation	Explanation
AA7	Action Area of the B3 Action group on "development and adoption of eHealth programmes and teleservices to support integrated care and service innovation" or "ICT and Teleservices".
B3	Action Group B3 "Replicating and tutoring integrated care for chronic diseases, including remote monitoring at regional level" in the EIP AHA. <u>http://bit.ly/13E7aR1</u>
BRAID	EC-funded project 2010-2011 ("BRAID" stands for Bridging Research in Ageing and ICT Development). <u>www.braidproject.eu</u>
C2	Action Group C2 "Development of interoperable independent living solutions, including guidelines for business models" in the EIP AHA. http://bit.ly/1AkPPbG
СНА	Continua Health Alliance, <u>www.continuaalliance.org</u>
D3&4	Work group "Interoperability Process & Best Practices" in C2
eEIF	European eHealth Interoperability Framework, http://bit.ly/1lTBlaJ
EIP AHA	European Innovation Partnership for Active and Health Ageing, http://bit.ly/J9COKR
ІСТ	Information and Communication Technologies
IHE	Integrating the Healthcare Enterprise, <u>http://www.ihe.net/</u>
NGOs	Non-governmental organisations
SMEs	Small and medium size enterprises

Glossary: Definitions and Abbreviations

Executive Summary

The Antilope project has engaged with the European Innovation Partnership for Active and Health Ageing (EIP AHA). It has established links with the two most relevant Action Groups – C2 "interoperable independent living solutions" and B3 "integrated care for chronic diseases" – and their respective interoperability work streams. Over the course of the project Antilope has

- promoted its ideas and concepts of interoperability in the EIP AHA through various presentations and meeting participations;
- validated its use cases with the EIP AHA, especially with the B3 action group; and
- delivered technical advice and support including the eHealth framework, the concept of repositories, the approach of use cases and integration profiles, and validation/certification.

Antilope has been prominently referenced and featured in the 28 November 2014 version of the key C2 deliverable *D3: Interoperability process recommendation for EIP-AHA and for standardization.* The Action Group B3 and others are committed to considering and adapting the recommendations.

1 Introduction

Antilope is a thematic network of European organisations supporting the adoption and take-up of existing eHealth standards and profiles. It has been operating from February 2013 and will end in January 2015. The network was developed to promote and drive adoption of use cases, testing guidelines and testing tools on a European and national/regional level. The outcomes include a proposed common approach for the use of the eHealth European Interoperability Framework (eEIF), and for testing and certification of eHealth solutions and services in Europe. Antilope has developed recommendations and guidelines for the adoption, deployment and standardisation of a number of high-level interoperability use cases. To validate the Antilope approach and to disseminate and communicate results, the project arranged a website, communication vehicles, and a number of events and workshops across EU Member States with policymakers, relevant stakeholders and interested parties. Their comments and feedback have been reflected in the final versions of all Antilope technical deliverables.

1.1 "Alignment" with the EIP AHA

Within the Antilope work package 5 on validation, a specific task was dedicated to "Alignment with the EIP Active and Healthy Ageing" with the objective "to assure that the options and educational material of ANTILOPE are aligned with the objectives of the European Innovation Partnership on Active and Health Ageing (EIP AHA)".¹

The EIP AHA is an EU-led initiative that gathers stakeholders to work on shared interests, activities and projects to find and scale up innovative solutions that meet the needs of the ageing population. It currently consists of six action groups, 3,000 partners & 300 leading organisations representing 30 million citizens (more information about the mission, partners and activities of the EIP AHA is in section 3).² Antilope, on the other hand, is an EU project of 23 organisations covering just 24 months. The idea of "aligning" these two initiatives may require definition. The project considers this task to include:

- promotion of Antilope ideas and concepts of interoperability in the EIP AHA,
- validation of the Antilope use cases for the EIP AHA, and
- **technical support** to the EIP AHA.

In this sense, relevant indicators of success of this work package include the presence of Antilope at EIP AHA events, agreement about relevant use cases, and the extent to which Antilope concepts and ideas have been reflected in the EIP AHA. This report will consider these elements in the conclusion, section 4.

1.2 Purpose of this document

This deliverable (D5.2) discusses the links of the Antilope project with the EIP AHA, specifically with the EIP AHA Action Group C2 "Development of interoperable independent living solutions, including

¹ Antilope Grant Agreement Annex I, "Description of Work" version 2013-02-04 16:06, page 15.

² EIP AHA statistics cited after presentation from Jorge Pinto Antunes, Acting Head of Unit, DG SANCO, European Commission, "A strategy for scaling up successful innovations", given at EHTEL Symposium, 25 September 2014.

guidelines for business models". The report will consider alignment in terms of promotion, validation and support as discussed above, and discus the links both in terms of process and of results. By doing so, this document will establish the relevance of the Antilope approach and its proposed guidelines for the European eHealth field, represented here by the region and projects that have agreed to coordinate their activities in the framework of the EIP AHA.

1.3 Document structure

The report provides in section 2 a short overview of the EIP AHA and its efforts related to eHealth interoperability, including an overview of the related Action Groups and the emergence of the D3&4 group in interoperability. Section 3 discusses the links between Antilope and the EIP AHA including initiatives to promote Antilope, the validation of Antilope's use cases, and an analysis of Antilope elements that are reflected in the latest EIP AHA documents. A conclusion (section 4) offers an overall analysis and perspective.

2 The EIP AHA and interoperability

The European Innovation Partnership on Active and Healthy Ageing is part of the EU's Innovation Union Strategy, one of the Europe 2020 flagship initiatives to strengthen Europe's scientific performance, to improve cooperation between the public and private sectors, and to remove obstacles that prevent innovations to reach markets. The instrument of the innovation partnerships – there are currently at least five – seeks to strengthen the cooperation between the public and private sectors by assembling large coalitions of stakeholders including Member States and regions, NGOs, industry, and others in the initiative. The following discussion focuses on the European Innovation Partnership for Active and Health Ageing (abbreviated here by "EIP AHA") which was the first innovation partnership and the one most relevant for eHealth and interoperability.³



Figure 1: EIP AHA priority areas

2.1 Overview of the European Innovation Partnership for Active and Health Ageing

The European Commission conceived of and developed the European Innovation Partnership for Active and Health Ageing over 2010 and early 2011 to bring together key stakeholders and to define a positive vision for ageing well, establish common priorities for innovation, tackle barriers to innovation, and accelerate and scale up relevant innovative solutions across Europe. A steering group was convened for an initial meeting in May 2011, chaired jointly by Commissioners Neelie Kroes (Digital Agenda) and John Dalli (Health) and assembling Member States, regions, industry, health- and social care professionals, elderly and patient organisations and other interest groups. The group agreed to the overall target to make two extra healthy life years a reality by 2020, which

³ Information about the EIP background and intent is gleaned from the EC press release on 2 May 2011, <u>http://europa.eu/rapid/press-release IP-11-519 en.htm</u>.

The innovation partnerships include, apart from active and healthy ageing, those on (2) agricultural sustainability and productivity, (3) smart cities and communities, (4) water and (5) raw materials. See http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=eip (accessed in December 2013).

will contribute to pursuing a triple win: healthy elderly, healthy public finances, and healthy business.⁴

In its second meeting in November 2011 the steering committee agreed the strategic implementation plan and priority areas. In the strategic plan the steering committee recognised the lack of interoperability and standards as one of the most important barriers standing in the way of successful innovation.⁵ To tackle innovation barriers, the steering group structured the EIP AHA work in three pillars reflecting the 'life stages' of the older individual in relation to care processes (A: Prevention, screening and early diagnosis; B: Care and cure; and C: Active ageing and independent living), and defined five specific actions to be tackled in 2012, among which were:

- [B3] "Replicating and tutoring integrated care for chronic diseases, including remote monitoring at regional level"
- [C2] "Development of interoperable independent living solutions, including guidelines for business models"⁶

(It should be noted here that this division of tasks among the EIP AHA action groups has made the Antilope task more difficult: action group B3 with its remit on eHealth, integrated care and remote monitoring would seem to be the logical target group for Antilope. However, it was not specifically charged with developing interoperability recommendations: that task was allocated to the independent living group C2. How this has affected the alignment between Antilope and the EIP AHA will be assessed in conclusion section 4.)

In February 2012 the Commission issued an invitation for commitments to the EIP AHA. Subsequently six Action Groups were formed, made up of universities and research groups, public authorities, health providers, industry, non-governmental organizations representing citizens, older people and patients, and others. They presented Action Plans at the Conference of Partners of 6 November 2012 and began to work towards implementation.

2.2 Action group C2 "interoperable independent living solutions"

In its action plan submitted at this conference in November 2012, C2 committed to issue as one of two key deliverables:

By 2015 availability of key global standards and validated implementations of interoperable platforms, solutions and applications for independent living.⁷

⁴ EC press release on 2 May 2011, <u>http://europa.eu/rapid/press-release IP-11-519 en.htm</u>.

⁵ Strategic Implementation Plan for the European Innovation Partnership on Active And Healthy Ageing, Final Text Adopted By The Steering Group On 7/11/11, available at http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/steering-group/implementation_plan.pdf. Reference to interoperability on page 6. The Commission in February 2012codified this strategic plan in its Communication "Taking forward the Strategic Implementation Plan of the European Innovation Partnership on Active and Healthy Ageing", COM/2012/083 final.

⁶ http://europa.eu/rapid/press-release IP-11-1309 en.htm

⁷ [C2] Action Plan on 'Development of interoperable independent living solutions, including guidelines for business models', 6 November 2012, <u>http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/c2_action_plan.pdf</u>

In the specific objectives under interoperability, the action group committed:

(a) To promote standards, guidelines and reference platforms for interoperable solutions in the domain of active and independent living and demonstrate by 2015 an ICT ecosystem that uses them in pilot sites involving at least 5,000 users in at least five countries.

(b) To monitor the availability of key global standards and validated implementations of interoperable platforms, solutions and applications for independent living.

(c) To generate and make available evidence on the return on investment of these solutions and applications, based on experience involving at least 10 major suppliers, 100 SMEs and 10,000 users.

The C2 action group formed the Action Group Management and Coordination Team (AGMCT) to oversee and monitor the development of deliverables, and developed the C2 Operational Plan which has been updated as new deliverables became included and reflected in the document.

2.3 Action group B3: "integrated care for chronic diseases"

A second action group in the EIP AHA has relevance for eHealth interoperability: the action group B3 "Replicating and tutoring integrated care for chronic diseases, including remote monitoring at regional level". It too delivered an action plan at the November 2012 conference, of which below is a graphic representation.



EIP AHA B3 Action Plan

Figure 2: B3 Action Plan (Nov 2012)

B3 did not accord interoperability the same significance as C2, but it did address the issue. The action group 7 "ICT and Teleservices" has sought to identify solutions which improve interoperability between record systems and data sharing to improve the effectiveness of health and social care ICT systems and data sharing. Initially it sought to develop a "Toolkit for Electronic Care Records / ICT /

Teleservices" by December 2014 (the timeline was later extended to December 2015) that would include approaches to managing interoperability.⁸

In the first half of 2013 there was growing recognition among the B3 and C2 action groups that there was considerable overlap of their remits and a need to coordinate activities. As a result the coordinators of the two groups met in June 2013 in Brussels to align key activities and avoid duplication of efforts. They identified interoperability and standards as a synergy issue between B3 and C2 Action group that would be considered a "joint activity" of B3 and C2. It was agreed that the C2 action group (specifically the D3&4 group) would take the lead on interoperability and that B3 would feed with its expertise during the process, while considering interoperability in its analysis of good practices within the EIP AHA (see below section 2.5).

2.4 D3&4 group on interoperability in action group C2

In the first months of 2013 C2 formed the D3&4 group "Interoperability Process & Best Practices" to oversee the deliverables related to interoperability:

- D3 Interoperability process recommendation for EIP AHA and recommendations for standardisation
- D4 Set of good practice documents for the implementation of independent living solutions⁹

In the spring and summer the deliverable leader led internal and external consultations about a proposed interoperability approach and arrived by November 2013 at the following elements¹⁰:



Figure 3: D3&4 Interoperability approach

⁸ [B3] Action Plan on "Replicating and tutoring integrated care for chronic diseases, including remote monitoring at regional levels", 6 November 2012, <u>http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/b3_action_plan.pdf</u>. The B3 action group has been coordinated by ECHA, Epposi, NHS 24, Phillips, Puglia and the IESE Business School Barcelona; Action group 7 was led by Epposi and later by NHS24. The comparison between B3 and C2 is based, among other factors, on the number of references to "interoperability" in the action plans: 32 times in C2; three times in B3.

⁹ These elements are included in the C2 operational plan reflected here is version v0.09, effective 12 July 2013.

¹⁰ The D3&4 leader outlined the C2 interoperability approach on 28 November 2013 in a presentation to eVIA, available at <u>http://evia.imasdtic.es/DescargarArchivo.aspx?idArchivo=229</u>.

The declared objective was to move towards an innovation ecosystem for active and independent living to prevent fragmentation and vendor lock-in. The intent was to establish an innovation ecosystem of living labs where interoperability is practiced. Then the independent living market would follow. Two central elements of C2's proposed approach were:

- the establishment of three repositories: of specifications and products, of evidence of interoperability, and evidence of consensus; and
- the recommendation to use ageing scenarios and use cases (adapted from the BRAID project) and profiles as the key building blocks of interoperability.

At the second EIP AHA Conference of Partners in November 2013, C2 included in its progress report the methodology of the repository.¹¹

There was steady progress in subsequent months. At the C2 meeting on 24 September 2014 (Brussels) there was a progress report from D3&4 group and a vigorous exchange on interoperability. D3&4 called on EIP AHA partners to contribute to a "final sprint" to help finish the D3 recommendations document. Among various partners, Antilope committed to contributing key variables including an interoperable model, a comprehensive glossary and a use case template. Other contributors included ReAAL and Offis / AAL Joint Programme. (For an overview of the final sprint roles and to do items see Figure 4.)

Items for Interoperability	Sprint 1 (mid November)	Later Sprints
Common interoperability framework	Antilope contribution: • IOP model • Glossary • Use case template	Guidelines
Application taxonomy	Offis/AAL JP contribution	
Application integration profiles examples	Offis/AAL JP contribution Check with Oskar Jonsson for contribution on social alarm	
Application integration profiles description template	Offis/AAL JP contribution Liaison with Antilope	
Platform Interoperability	ReAAL contribution Concepts Liaison with Antilope for glossary Check with OpenURC	Syntactic interoperability (REST) Platform taxonomy Semantic interoperability example
Liaison with standards	<i>ReAAL contribution</i> Decision on workshop	Workshop

Figure 4: Final sprint from 24 September 2014 C2 meeting

A complete and robust version of the D3 document, led by the D3&4 group but with substantial input from action group B3 and Antilope, was published on 28 November 2014. A detailed discussion of this document, and the input from Antilope, is in section 3.3.

¹¹ European Innovation Partnership on Active and Healthy Ageing Action Groups – First Year Achievements, November 2013, available at <u>http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/achievements_2013.pdf</u>.

2.5 B3 Group: Maturity model

Without a specific focus on interoperability, the B3 group worked on a collection of good practices and a maturity model to assess the readiness of a region for the ICT adoption to support integrated care. The maturity model was based on interviews with six regions, and was released in draft form at the EIP conference of partners on 1 December 2014.¹²



Figure 5: Proposed B3 maturity model for integrated care

The model contains a separate dimension on standardisation and simplification (which includes interoperability). The document also contains a draft of potential definitions of the dimensions and illustrative indicators for each dimension of maturity. For "Standardisation they are as follows:

Dimension	Objective	Maturity indicators
[]		
Standardisation	Simplification of infrastructure, fewer integration points to manage, easier interoperability	Use of international standards, reduction in number applications, regional procurements, mandates
[]		

Figure 6: Proposed B3 definition and indicators for standardisation

The planned next step will be to turn this framework into a self-assessment tools to allow benchmarking of the regions and matchmaking "pioneers and followers. While at the time of writing the C2 group and Antilope had not had a formal opportunity for comment, B3 will seek their comments and help as this maturity model is refined.

¹² The maturity model is described in the internal document "EIP-AHA B3 Maturity Model". Further interviews with six more regions are planned for early 2015 for the full maturity model to be released at the EIP AHA summit in March 2015 in Brussels.

3 Links between Antilope and EIP AHA

Within the Antilope consortium, Continua Health Alliance has led the task of EIP AHA alignment. Continua was already closely involved with the preparation of the EIP AHA after having participated in the public consultation in late 2012, the expressions of commitments in early 2013, and numerous informal meetings. Continua formally joined the C2 action group in January 2013.

As discussed in the introduction section 1.1, Antilope understands the term "alignment" to include the following elements:

- **promotion** of Antilope ideas and concepts of interoperability in the EIP AHA, including the eHealth interoperability framework and the approach based on use cases and integration profiles;
- **validation** of the Antilope use cases for the EIP AHA, to establish the relevance of the eEIF for the European eHealth field; and
- **technical support** to the EIP AHA, including providing expertise, concepts and recommendations.

Following are discussions on each of these areas, beginning with a record of tangible actions that linked Antilope to EIP AHA.

3.1 Promotion of Antilope in EIP AHA

On 5 February 2013, shortly after the beginning of the Antilope project, Continua participated in a meeting of the C2 action group. Informally it informed the group about Antilope, and also used this meeting to reach out to the leadership of B3 represented by a member of the B3 coordination group from NHS24. It was suggested to meet with the leader of the B3 action area 7 on "ICT and Teleservices". It was subsequently agreed that an opportune moment for a meeting was the eHealth week in Dublin in May 2013.

The meeting took place on 14 May 2013 in Dublin, after the eHealth week session "The EIP AHA Specific Action B3 on Integrated Care". The immediate outcome was an invitation for Antilope to present its case to a joint meeting of the coordinators of B3 and C2 action groups on 6 June 2013 in Brussels.

Antilope subsequently participated or presented in the following C2 meetings and initiatives:

- 6 June 2013, Brussels: joint meeting of the B3 and C2 coordination groups
- 25 September 2013, Norrkoping, Sweden: Workshop at AAL Forum
- 5 May 2014, Berlin, Germany: C2 Action Group meeting
- 24 September 2014, Brussels: C2 Action Group meeting
- 1 December 2014, Brussels: EIP AHA Conference of partners

There is more information on the substance of these meeting below.

3.2 Validation of the Antilope use cases

At the 6 June 2013 meeting, Antilope representatives (from WP1 and WP5) gave an overview of the proposed Antilope use case approach to the joint B3 and C2 meeting. Subsequently they delivered a description of Antilope use cases (adapted from the eEIF) with a request that the EIP AHA members consider these use cases for relevance for their work.

#	Medical domain	Description	Scale
1	Medication	e-Prescription and e-Dispensing	1a) Cross-border 1b) National/regional 1c) Intra-hospital 1d) Citizens at home
2	Radiology	Request and results sharing workflow for radiology	2a) National/regional 2b) Intra-hospital
3	Laboratory	Request and results sharing workflow for laboratory	3a) National/regional 3b) Intra-Hospital
4	Patient Summary	Patient Summary sharing	4a) Cross-border 4b) National/regional 4c) Citizens at home
5	Referral- and Discharge reporting	Cross-enterprise Referral and Discharge Reporting	National /regional 5a) Referral of patient from primary to secondary care 5b) Discharge report from secondary care
6	Participatory healthcare	Involvement by chronic patients in electronic documentation of healthcare information	Citizens at home
7	Telemonitoring	Remote monitoring and care of people at home or on the move using sensor devices	Citizens at home
8	Multidisciplinary consultation	Medical Board Review	National/Regional

Figure 7: Antilope use cases¹³

Of special importance was here the feedback of the B3 action group given its interest in advancing eHealth and integrated care. On 21 June 2013, the B3 representative confirmed the relevance of the use cases: "We reviewed with task co-ordinators of AA7 use cases and we agreed that in particular the uses case of patient summary, medical summary/sharing and telemonitoring are relevant for the scope of our activities."

In November 2013 C2 introduced the BRAID scenarios as relevant use cases. The BRAID use cases came from the BRAID project that, between 2010 and 2012, had developed material and deliverables for ICT and active ageing.¹⁴ Given that Antilope focuses on healthcare use cases, it would be expected that only some would correspond to BRAID's, especially in the area of remote monitoring, medication adherence, and promotion of healthy habits. An analysis of BRAID and Antilope use cases (see appendix A) found indeed alignment with Antilope's use case on participatory healthcare (use case 6) and telemonitoring (7).

It should be noted, however, that few of the other Antilope use cases can be applied to the active ageing field – and that, in turn, ICT-enabled active ageing includes many scenarios that do not have a

¹³ These use cases are taken from the Antilope deliverable D1.1: Refinement Definition document version 0.9 (January 2014). In the document submitted to the EIP in June 2013 there were a total of ten (10) use cases: use cases 2 (radiology) and 3 (laboratory) were originally split in two but for practical reasons Antilope determined to merge them.

¹⁴ See <u>http://www.braidproject.eu</u>, accessed 27 September 2014.

healthcare dimension. The collection "Use Cases in the Ambient Assisted Living domain"¹⁵ lists more than 200 use cases that include robotics, gaming, life assistance, social networking and video conferencing and many more. But fewer than one in ten is about health.¹⁶

Thus the alignment of use cases between Antilope and EIP AHA may appear limited, because at this time the analysis is limited to those use cases that have been considered in the C2 Action Group focusing on independent living solutions. Going forward more use cases should be considered that encompass the entire EIP AHA. The conclusion (section 4) will return to this point.

3.3 Technical support: the D3 Interoperability Process Recommendations

On 28 November 2014 the D3&4 group presented version 4 of its key deliverable *D3: Interoperability process recommendation for EIP-AHA and for standardization.* The document is version 4 and not yet public, but is sufficiently robust to be considered for the purposes of assessing the alignment of Antilope and the EIP AHA at the end of Antilope project.¹⁷

C2 Strategic Recommendations5
Recommendation S1: Support Several Types of Readiness5
Recommendation S2: Use the Integration Profile Approach6
Recommendation S3: Build a Community7
C2 Operational Recommendations7
Recommendation O1: Adopt a common interoperability framework7
Recommendation O2: Adopt an appropriate validation approach8
Recommendation O3: Build a Set of Application Integration Profiles9
Recommendation O4: Integrate Features from Multiple Platforms9
Recommendation O5: Liaise with Standardisation Activities10

Figure 8: D3 Interoperability process recommendations (excerpt from table of content)"

The document contains three strategic recommendation and five operational recommendations (see Figure 8). A detailed discussion goes beyond the scope of this report: here the focus is on those elements that show alignment with Antilope.

- <u>Recommendation S2: Use the Integration Profile Approach</u>: The recommendation makes specific reference to the integration profile approach and terminology of IHE, a key member of the Antilope consortium.
- <u>Recommendation S3: Build a Community</u>: The recommendation envisions a contributing community that drives interoperability practices and creates integration profiles. The recommendation cites IHE Connectathons and Continua plugfests as possible models.
- <u>Recommendation O1: Adopt a common interoperability framework</u>: The recommendation makes specific reference to the Antilope common interoperability framework.
- <u>Recommendation O2: Adopt an appropriate validation approach</u>: The recommendation, coming specifically from the B3 Action Group, calls for a strong system of regulation for

¹⁵ Discussed already in section 2.4.

¹⁶ Based on an analysis of a sample of 239 cases.

¹⁷ The deliverable is at the time of writing (1 December 2014) not published but accessible for members of the C2 Yammer group at <u>https://www.yammer.com/c2independentliving/#/uploaded_files/27381926</u>

vendors and partners that certifies compliance with project specifications, and cites the IHE Connectathon as a model.

The document then lays out an EIP AHA Common Interoperability Framework that makes direct reference to the Antilope framework and the Antilope D1.1 deliverable.

In sum, it is evident that Antilope has established relevance for the EIP AHA and given relevant and impactful input and technical support to the EIP AHA. Antilope is cited in the document's preface in first place among the contributing initiatives.¹⁸

¹⁸ Apart from Antilope the preface also cites:

[•] The ReAAL FP7 project (http://www.cip-reaal.eu/)

[•] The BRAID FP7 project (http://www.braidproject.eu/)

[•] The Engaged FP7 project (http://engaged-innovation.eu/)

[•] A Study carried out by the AAL Joint program on use case analysis

4 Conclusion

While the work of the EIP AHA has barely begun, the Antilope project will come to an end in January 2015. But this will not end technical advice and input from leading European eHealth standards initiatives. Other EU initiatives may assume "ownership" of the eEIF and the Antilope products. And principal Antilope consortium members will continue their work in C2 and B3 to advance interoperability as part of their normal mission.

They can build on a solid foundation of work. Antilope has successfully "aligned" itself with the EIP AHA.

- In regard to **promotion**, Antilope has inserted itself in the workings of the C2 Action Group, has participated and presented in meetings, and has contributed content and ideas to C2's deliverables (and, indirectly to Action Group B3 as well). Anybody in the EIP AHA interested in interoperability will be aware about Antilope.
- Regarding **technical support**, Antilope has contributed key concepts and ideas that have been adopted by the EIP AHA. They include the eHealth interoperability framework, the concept of repositories, the approach of use cases and integration profiles, and validation/certification, among others. Continua and IHE may have served as models for the proposed idea of building a "community". Even perhaps rather "trivial" contributions like a use case definition, terminology or template could, if adopted, facilitate the advancement of interoperability.
- In terms of **validation** of Antilope use cases, the result appears mixed. Only two or three of Antilope's eight use cases have been reflected in C2's use cases (whether they come from BRAID or the AAL JP). But the EIP AHA overall is more reflective of the healthcare field. Notably the B3 group is committed to using the Antilope use cases as part of their repository, and will include them in the self-assessment tool based on the maturity model described in section 2.5.

This successful alignment of Antilope with the EIP AHA has happened chiefly with the "independent living" action group C2 where interoperability is part of the core mandate. By contrast, in the "eHealth" action group B3 interoperability is merely one of ten dimensions to promote the ICT-supported integration of care. The next step will be the dissemination and promotion of the D3 recommendations among the regions in the C2 and B3 action groups and, indeed, all regions in the EIP AHA.

For this, the EIP AHA can use further support from interoperability initiatives, with or without EC project support. Antilope recommends that they, to be helpful, may consider further refining the eEIF use cases, and select or develop commonly available tools and terminologies that can be reused in the field, such as management tools, validators and others.

References

- Action Plan on 'Development of interoperable independent living solutions, including guidelines for business models' [C2], 6 November 2012, <u>http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/c2_action_plan.pdf</u>
- Action Plan on 'Replicating and tutoring integrated care for chronic diseases, including remote monitoring at regional levels' [B3], 6 November 2012, <u>http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/b3 action plan.pdf</u>.
- D3: Interoperability process recommendation for EIP-AHA and for standardization (draft version 4), internal but accessible for C2 members at https://www.yammer.com/c2independentliving/#/uploaded files/27381926
- *European Innovation Partnership on Active and Healthy Ageing Action Groups First Year Achievements, November 2013,* available at <u>http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/achievements_2013.pdf.</u>
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- Strategic Implementation Plan for the European Innovation Partnership on Active And Healthy Ageing, Final Text Adopted By The Steering Group On 7/11/11, available at <u>http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/steering-</u> group/implementation_plan.pdf.
- Taking forward the Strategic Implementation Plan of the European Innovation Partnership on Active and Healthy Ageing, COM/2012/083 final, http://ec.europa.eu/health/ageing/docs/com 2012 83 en.pdf

Appendix A: Analysis of BRAID use cases and Antilope use cases

In November 2013 D3&4 proposed to orient the EIP AHA interoperability approach towards the BRAID scenarios. The BRAID scenarios emerged from the eponymous project, an EU-funded initiative ("BRAID" is short for Bridging Research in Ageing and Information and Communication Technology Development) that ran between 2010 and 2012 to develop a comprehensive Research and Technological Development (RTD) Roadmap for Ageing.¹⁹

The 29 BRAID scenarios focus on ageing and contain sketches for four "life settings":

- (1) Independent Living,
- (2) Health and Care in Life,
- (3) Occupation in Life and
- (4) Recreation in Life.

The scenarios are detailed descriptions of the daily life and circumstances of old people (usually featured with first name and age) who are assisted by (futuristic but not implausible) information technology. Antilope, of course, focuses on eHealth interoperability, and therefore the most relevant BRAID scenarios for Antilope are those in the "health and care in life" setting.

Conversely, of the Antilope use cases (see Figure 7), most focus on cross border information exchange, hospital settings, large scale IT systems, or on information sharing among healthcare professionals at the regional or national level. Only two envision the involvement of the patient and therefore offer overlap with the BRAID scenarios: use case 6 ("Involvement of chronic patients in electronic documentation of healthcare information") and use case 7 ("Remote monitoring and care of people at home or on the move using sensor devices"). Following are two juxtapositions and analyses of these use cases and the most relevant BRAID ageing scenarios.

¹⁹ The BRAID project executive summary is available on the EC server at <u>http://ec.europa.eu/digital-agenda/en/news/executive-summary-braid-project-bridging-research-ageing-and-information-and-communication</u>. The BRAID scenarios are taken from *ICT & Ageing Scenarios*, edited by the UNINOVA – CoDIS Group and University of Amsterdam-FCN Group, undated publication [2012?], available at <u>http://www.braidproject.eu/sites/default/files/Ageing_scenarios.pdf</u>.

Alignment of Antilope use case 6 and BRAID medication assistance scenario



Figure 9: BRAID scenario "Caring and Intervention – Medication assistance"²⁰

Antilope use case 6: "Participatory healthcare"	[BRAID] Caring and Intervention: Medication
	Assistance
Introduction	Description
There is a group of use cases that support the concept	Jennifer is a 76 year's old retired nanny. In spite of
of 'for ever-present care'.	feeling well, she had to stop working 6 years ago due
They aim at involving a patient actively in the	to an aggravation of her diabetes condition. Jennifer
documentation of his/her specific chronic condition	lives with her husband Nicholas, who unfortunately
(or conditions), and making this physiological	suffers from osteoporosis, in a small house near
information available to medical staff either at a	downtown. As they are quite isolated from the rest
hospital or another medical service provider so as to	of the population, they had a monitoring system
assist in the diagnosis and/or monitoring of the	installed, integrating among other devices special
patient's treatment.	mobile phones with medication assistance
One option to encourage patient interaction and	functionality. Using this system, they feel more
compliance with an appropriate treatment regimen	accompanied and assured that the right medication is
involves the use of PC-based, web-based, or mobile	taken at correct time. Jennifer and Nicolas are
applications, that enable new ways of involving the	assured that their personal information held on these
patient in his/her own healthcare process. In general,	special mobiles is kept secure and private as they are
these applications may consist of several	CE rated and abide by a regulated standardization
functionalities that are described below.	that has been passed across the EU.
1. Patient generated data: The data may include	[] Before going out, Jennifer goes to the kitchen to
quantitative information such as weight or blood	grab her special mobile phone (that keeps them

²⁰ From: ICT & Ageing Scenarios, edited by the UNINOVA – CoDIS Group and University of Amsterdam-FCN Group, undated publication [2012?], page 13.

pressure, as well as qualitative information about	tracked while walking) to check the shopping list and
personal health. These patient generated data	notices a flashing hint reminding to buy a new batch
facilitate a more continuous monitoring of the	of diabetes pills. This reminder has been
patient's health status that can be used to generate	automatically sent on her special mobile phone by
warning signs before complications of these chronic	the monitoring system. In fact when the pills in her
conditions occur.	dispenser are under a threshold, the dispenser sends
2. Patient empowerment: The applications also may	an alarm to the system that reminds to the
offer functionalities for informing, reassuring and	appropriate person, via the chosen device. []
supporting the patient, helping him/her to adhere to	
the set health improvement goals.	
3. Shared decision making: Especially in chronic	
healthcare conditions, there is a trend towards a	
shared decision making regarding treatment,	
prevention, and life quality. Applications can offer	
many tools to support this possibility including	
teleconferencing, and discussion threads.	
[]	

Alignment assessment:

There is a **fair amount of congruence** between the two scenarios:

- The patient lives independently at home and manages their condition autonomously.
- The patient is assisted by remote automated and sometimes personalised monitoring (through a healthcare professional or an informal carer).
- The privacy and security of personal information is ensured.

There are **also differences**:

- While the Antilope use case seeks to actively involve the patient and encourage patient interaction, empowerment and shared decision making ("co-production"), in the BRAID scenario the patient does not seem to be involved in actively monitoring and communicating their health status (ie measuring blood glucose level or blood pressure, or rating their well-being). Instead, the patient remains rather passive.
- BRAID puts emphasis on an automated monitoring system such as the pill dispenser or the automated (presumably geo-) tracking function of the mobile phone, which is absent in Antilope.

Overall the use case and scenario should be considered aligned, particularly given the rapid advances in mobile technologies and health sensors, as well as the growing computer literacy of old patients and their demands to be actively engaged in the management of their condition.

Alignment of Antilope use case 7 and BRAID healthy lifestyle intervention scenario



Figure 10: BRAID scenario "Caring and Intervention – Healthy Lifestyle Intervention"²¹

Antilope use case 7: "Telemonitoring"	[BRAID] Caring and Intervention: Healthy Lifestyle
	Intervention
This Use Case focuses on the remote monitoring and	Manfred, 79, and although retired he likes to
care of people outside the environment of care	maintain some healthy activity, especially because he
facilities, involving sensors that transmit information	is overweight and he started to have some related
such as activity, heart rhythm, blood pressure,	health problems.
glucose level, weight and so forth.	Manfred, supported by a smart cane, walked into the
In this Use Case, the blood pressure measurements	kitchen later than usual, a monitor positioned in the
that have been gathered by a device are sent	kitchen with an interactive interface reminds him of
electronically to an application, which in turn sends	the session with his remote coach. But Manfred did
the data via the internet to a central location where	not start his coaching session yet – he was a little
these data are collected and monitored. This location	embarrassed since he has not committed to regularly
may relay the information to other networks and	doing his daily exercise routine. Instead, using a voice
services.	command, he started his exercise game routine. []
[]	He knows he can push himself hard because Manfred
Consider a middle-aged patient with chronic heart	is well aware that the system monitors his vital signs
failure who needs to measure his/her blood pressure	and does not let him overdo it. This close monitoring
on a daily basis. The blood pressure device can send	is particularly important because of his congestive
the measurement results to a mobile application	heart condition diagnosed a couple of years ago.
through a wireless connection. These results can then	[]
be sent from the mobile device to a chronic care	The results of his exercise were instantly

²¹ From: ICT & Ageing Scenarios, edited by the UNINOVA – CoDIS Group and University of Amsterdam-FCN Group, undated publication [2012?], page 15.

management centre or to a responsible healthcare	communicated to his coach, and when Manfred
professional.	actually initiated the session there was already a
The information is monitored both by rules-based	message praising him for his accomplishments. The
logic implemented as part of the application, and by	coaching system had already incorporated today's
qualified nurses on an on-going basis. If needed, a	weight measurements (automatically assessed by the
physician is informed about any relevant degradation	load cells in the bed as well as a scale in the floor mat
in the patient's health status, so that preventive	in the bathroom), blood pressure – measured by a
measures can be taken at an early stage. As a result,	sensor in his watchstrap, and the sodium ion
patients' complications can be detected early, and the	concentration in his urine through the chemical
patient is less likely to return to the hospital.	analysis performed by the toilet. The coaching
	system, as well as his coach, was pleased with his
	outside activities, socialization and diet. Even his
	balance had improved so much that his smart cane is
	no longer required as much when he gets up at night
	to go to the bathroom, rather than providing him with
	mobility support.

Alignment assessment:

As in use case 6, there is a **fair amount of congruence** between the two scenarios:

- The patient lives independently at home.
- Patient data is collected through body sensors and transmitted to a remote monitoring centre.
- The patient receives remote assistance and coaching.
- Both scenarios foresee alerts and assistance mechanisms based on automated logic and algorithms.
- The Antilope use case considers (rather narrowly) the transmission of data from a sensor to a data aggregator device. The BRAID scenario seems to take this data transmission as a given, although the reference to a "monitor positioned in the kitchen with an interactive interface" seems to hint at the presence of such a data aggregator.

There are **also differences**:

- The Antilope use case is limited to the monitoring of the health status, while BRAID foresees a more comprehensive system of activity coaching, diet monitoring, and social life support.
- BRAID foresees the utilisation of sensors in a smart cane and a toilet which may by some be considered overly intrusive or controversial, or both.

In sum, the Antilope use case and the BRAID scenario should be considered aligned.