



Proactive Enhancement
of Human Performance in Border Control

Grant agreement n° 653676

Joint BODEGA-ABC4EU Showcase Event Report



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2	CEA LIST	CEA	France
3	AIT Austrian Institute of Technology GmbH	AIT	Austria
4	University Of Namur	NAM	Belgium
5	Atos Spain, S.A	ATOS	Spain
6	Thales Communications & Security	TCS	France
7	European Strategic Intelligence Company	CEIS	Belgium
8	Zanasi & Partners	Z&P	Italy
9	International Union of Railways	UIC	France
10	Agenzia delle Dogane e dei Monopoli	ADM	Italy
11	Center for Security Studies – KEMEA	KEMEA	Greece
12	The Finnish Border Guard	RAJA	Finland
13	Ubium	Ubium	Finland
14	HappyWise	Happywise	Finland



Table of Contents

Deliverable information	III
Table of Contents	VI
1. Introduction	7
2. Day 2 – May 3rd 2017	8
2.1 Open discussion.....	8
2.2 Workshop 1: Lessons learned from Automated Border Control facilitation projects	11
2.3 Workshop 2: Technology as a European wide solution	11
2.4 Workshop 3: Field Studies and proof of concept - validation of results	13
3. Day 3 – May 4th 2017	14
3.1 Workshop 4: Responsible Research and Innovation & Border Control	14
3.2 Workshop 5: Prototype testing	14
3.3 Workshop 6: ABC4EU External End User Advisory Board meeting	15
3.4 Workshop 7: Exchanges of best practices and free discussion	16
Annex 1 – Joint BODEGA-ABC4EU Showcase Event Agenda	18



1. Introduction

The Joint BODEGA-ABC4EU Showcase Event took place on May 2nd-5th 2017 in Levi, Finland, hosted at the Levi Spa Hotel. The event provided an opportunity to expand the end-user community of the BODEGA and ABC4EU research projects while contributing to the dissemination, discussion and validation of their results. While the aim of BODEGA is to enhance efficiency, security and traveller experience of the border control process taking into account human factors and ethical aspects, ABC4EU¹ (Automated Border Control Gates for Europe) aims to harmonise border control technology in accordance with Smart Borders legislation.

The initiative was conceived in response to the European Commission's call for greater co-operation between EC-funded research projects. A special focus was placed on discussing the preliminary results of the two projects in light of the EU's changing legislation in the area of border control. The event saw the participation of 43 persons including members of EU and national law-enforcement agencies, representatives of Ministries of Internal Affairs of EU Member States, European universities, lobby groups and NGOs involved in activities related to security, technology and ethics. Chatham house rules were adopted throughout the event in order to stimulate open discussion. An Etherpad solution was also put in place allowing participants to ask questions in real-time and exchange views in an anonymous fashion.

The event was articulated into 7 thematic workshops:

- Workshop 1 examined lessons learned from previous Automated Border Control facilitation projects;
- Workshop 2 looked at the role of technology as a European wide solution;
- Workshop 3 focused on the results of BODEGA field studies and ABC4EU pilot tests;
- Workshop 4 featured an expert panel discussion around issues related to ethics, responsible research and innovation and border control;
- Workshop 5 was dedicated to the testing of prototype solutions developed during different projects;
- Workshop 6 hosted a meeting of the ABC4EU External End User Advisory Board;
- Workshop 7 consisted of a group discussion around a set of key questions put forward by the European Commission.

The following sections of this report provide an overview of the activities carried out and of the results achieved during the event.

¹ <http://abc4eu.com/>

2. Day 2 – May 3rd 2017

2.1 Open discussion

The Joint BODEGA-ABC4EU Showcase Event started with a preliminary session dedicated to open discussion amongst the participants.

Emphasis was placed on the importance of immigration on the European political agenda. It was noted that there is currently a political debate regarding the link between immigration and terrorism, and how immigration can be used to address the terrorist threat. A number of recent legislative measures introduced at EU level with regards to immigration were mentioned, such as the PNR Directive and the proposed EES and ETIAS systems.

One participant recalled his personal experience at a European airport at 9:30 in the morning, where he took him 1.5 hours to go through passport control. He noticed that the ABC Gates lane was blocked by people queuing up to manual passport control. He described ABC Gates as a point solution, which is neither connected to other solutions, nor it is part of an end-to-end process. He argued that while ABC is a mature technology that has been around for 10 years, it is necessary to shift from a layered approach to security to one based on a continuum, capable of addressing the whole travelling process.

A number of opportunities for the research community were then identified and discussed by the participants:

1. Departure checks in the country of origin could become part of the entry checks of the destination country, although this would require coordination between EU countries and non-EU countries.
2. The identity of the traveller could be registered at the beginning of the travelling process and then simply verified, without repeating the whole identification process at every step.
3. A proper framework is lacking for what concerns risk assessment. Even after the PNR Directive's approval, only routine checks are performed on PNR data. Carriers have an obligation to forward data (API and PNR) to different authorities with different requirements and clearances. Risk assessment is slowing down the spread of ABC e-gates. The Schengen Borders Code does not preclude automated, advance risk assessment.

One attendee asked what security arguments there are against restoring checks at national borders. He was answered that having common risk awareness is very important, and that Europe currently does not have a consolidated view of the threats against different EU countries. Lack of trust was indicated as an obstacle to a coordinated rather than a fragmented approach to risk management and border control.

The discussion continued with a participant making a comparison between current Schengen border checks and a hotel with several doors: a border guard stays at each door checking

who is coming in/out without knowing how long they will stay, somewhat like a hotel with no reception. He stressed the fact that no registry of third-country nationals is currently available as well as that border guards have little time for profiling and risk assessment.

Recalling his experience as a border control officer in a EU Member State, one attendee highlighted the need for innovative solutions to be implemented both at land and rail border-crossing points. In his view, a useful innovation could be the introduction of glasses enabling to take pictures of the traveller and then check them against databases. He stressed the importance to mutually integrate R&D activities and future European legislation, mentioning the example of the National Facilitation Programme. He explained that, in 2013, there was a first proposal for an EU Registered Traveller Programme, however this was removed from the 2016 version of the EC's proposal. The participant expressed his disappointment with such decision, as he considered a National Facilitation Programme to be necessary for his country.

A participant observed how the discussion had focused on technical problems which are also political, adding that the effectiveness of technical solutions is by definition limited and that new technologies also raise significant privacy issues, for example, in the case of data or software being owned/managed by a private company. An attendee replied that personal data protection is, indeed, very important and is one of the reasons why things are going so slow: every move is made with a view on ensuring full compliance with privacy regulations (e.g. with the PNR Directive). Another participant noted that, at the end, what matters is the law and that technologies are very useful for implementing the law.

The following question was then raised: is legal compliance the whole story? How do you fix it if something goes wrong? It was explained that intelligence can come from different sources (e.g. human component, previous interactions with authorities), including the open source environment (social media, news in printed and online media). EU regulations as to what kind of information can be used and for what purpose were mentioned as opposed to the US, where a more holistic approach is adopted. The EU's approach was described as more segmented, as certain authorities can only process a limited amount of information in order to make informed decisions. The EU's strong respect for privacy and data protection was also emphasised, alongside the lack of signs suggesting that more intrusive measures are to be expected.

One participant observed that, from his country's perspective, greater risks could come from airports rather than from land borders. He reported that EES piloting showed taking fingerprints from people sitting in a car takes an average of 22 seconds, whereas performing passport checks takes 8 seconds. He added that, in his country, ABC gates take 17 seconds to process a passenger and that the use of ABC is more economically convenient than manual checks, as ABC gates can operate on a 24/7 basis.

Referring to the issue of trust mentioned earlier, one participant asked if technology is actually capable of creating trust. He talked about an information sharing problem between different authorities. Agreeing with this remark, another attendee claimed that the problem with having authorities from different countries exchanging personal data could be partly solved by technology, in the sense that authorities can now share transactions data in an any-

mised, encrypted form. It was observed that trust building technologies are already used every day (e.g. encrypted email, HTTPS), but they seem unable to fix the problem.

Further expanding on the previous 'hotel' comparison, a participant described the EU as currently having one border - the hotel wall - but a lot of doors, and if we want to share information it is necessary to put it in common databases that are being checked at every door. However, if border guards have to stamp passport and check databases, they will not have time for profiling, for spotting suspicious cues from the passengers or for adding information to the databases. He concluded by complaining that his organisation had tried to raise these concerns before politicians but, unfortunately, they were not listened to.

A participant asked if any data protection issues have emerged from the German pilots run by EU-Lisa. She observed that the questions that will be posed by ETIAS are somewhat problematic: they may apply to Europe differently than to other countries. She stressed that the challenge is to adopt a common risk assessment strategy not only at European level but also at global level. An attendee noted that there was, indeed, a flaw in the Commission's proposal as far as ETIAS is concerned, and that they were trying to make sure that the questions asked by ETIAS are the same as those being asked by border guards.

2.2 Workshop 1: Lessons learned from Automated Border Control facilitation projects

During Workshop 1, researchers from four EC-funded projects focusing on Automated Border Control technology (MobilePass, Fastpass, ABC4EU and BODEGA) discussed the main results and lessons learned from the respective projects.

Representatives of MobilePass illustrated their mobile device for facial image and fingerprint recognition. Fastpass representatives described an on the move biometric identification system based on iris and fingerprint recognition technology. An ABC4EU consortium member illustrated the results of two pilots conducted in Spain and Portugal. Finally, the BODEGA project Coordinator presented some of the insights gained from workshops with end-users, in which the results of the BODEGA field studies, human factors requirements for future smarter borders and best practices in border control staff and training were discussed.

At the end of the presentations, a participant asked researchers from the four projects if they had taken into considerations the expectations and fears of the travellers and whether they think passengers are sufficiently aware of privacy-related risks. A member of the BODEGA consortium observed that field studies suggest that some travellers are against the use of certain border control technologies (e.g. biometric identification), while others do not really know where to get this information from. A member of the ABC4EU consortium added that the survey they conducted during pilot tests in Spain and Portugal showed that people tend to trust the technology but do not have enough information about it.

2.3 Workshop 2: Technology as a European wide solution

During Workshop 2, technological partners from the BODEGA and the ABC4EU consortiums gave a demonstration of different border control devices. The BODEGA consortium presented an HMI mock-up for facial recognition (see Figure 1), a mobile device for facial image and fingerprint capture and verification (see Figure 2) as well as results of research on video-based technologies.

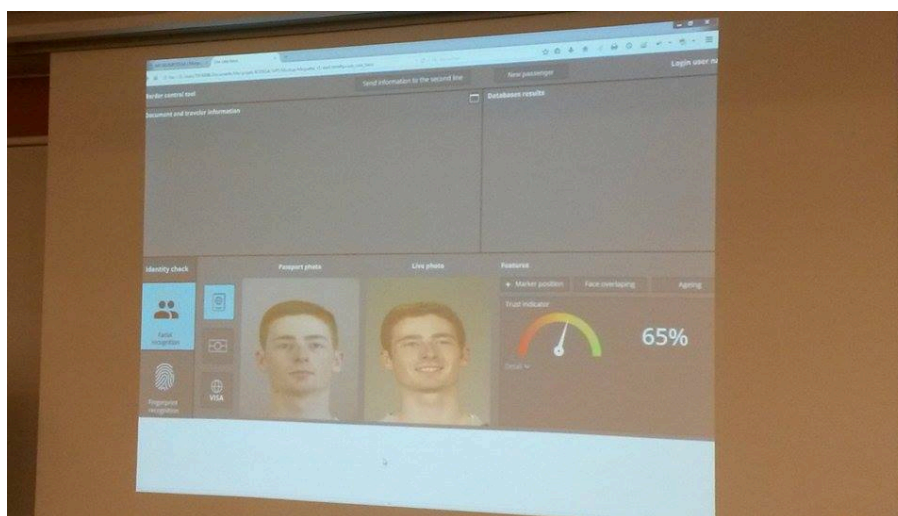


Figure 1. BODEGA's HMI facial recognition mock-up



Figure 2. Mobile device for fingerprint and facial image recognition developed by BODEGA consortium members during the MobilePass project

On the ABC4EU consortium's side, technology demonstrations focused on mock-up tools for detecting tailgating attempts and abandoned lost objects inside e-Gates, a subsystem for managing physical features of e-Gates as well as technology for attack detection based on facial recognition sensors (see Figure 3).



Figure 3. Presentation of attack detection system developed during the ABC4EU project

2.4 Workshop 3: Field Studies and proof of concept - validation of results

During Workshop 3, BODEGA consortium members presented the results of the field studies carried out in various EU countries and gave an overview of related models and end-user requirements (see Figure 4) BODEGA researchers followed border guards operating at different Schengen border-crossing points as they conducted activities such as identity checks, document validity checks and security checks. The data gathered through observations and interviews was used to model border guards' work and identify an initial set of border guards' needs and requirements.

Following the presentations about the BODEGA field studies, the ABC4EU consortium illustrated the results of ABC pilot tests conducted in Madrid, Lisbon and the port of Algeciras between December 2016 and February 2017. The tests focused on the following use cases: enrollment station, enrolment kiosk, a kiosk followed by a two-step ABC, single-step ABC and mobile.



Figure 4. Presentation of the results of the BODEGA field studies

3. Day 3 – May 4th 2017

3.1 Workshop 4: Responsible Research and Innovation & Border Control

Workshop 4 was dedicated to a panel discussion around issues related to Responsible Research and Innovation (RRI) and border control. The discussion was initiated by a group of experts from leading European universities, NGOs and associations and subsequently opened to the rest of the participants.

The session started with a presentation of the RRI framework adopted for the BODEGA project, centred upon a notion of performance in border control as driven by security, speed and fairness considerations. One participant criticised this approach, pointing at the fact that there may be a conflict between security and speed, and suggesting to include 'accuracy' as a fourth driver. He claimed that speed is not the same if seen from the perspective of border guards or from that of the travellers. One member of the expert panel added that security is a political construct and, as such, there might be different notions of security. She also pointed out that speed is very important for the travellers but may not be the top priority for border guards.

Another panel member observed that after the attacks of September 11th 2001, more stringent security measures were implemented upon passengers. As result, the most dangerous place of the airport became the area before the security checks. However, overall security was not improved. One participant claimed that a faster process is not necessarily a more ethical one. He defined border control as a public service aimed at enforcing the law and, which, as result, needs to be cost-effective, making the best use of the available resources. From his point of view, ethical solutions are about reaching an optimum trade-off.

Discussing the importance of responsible research, one panel member stressed the role of privacy by design approaches, noting that privacy considerations should be embedded in all the steps of a research project. An audience member mentioned the fact that when a person visits a website, his/her data are passed on to third party companies and then to advertisers. He argued that the more steps are taken down that chain, the less responsibility is felt towards the person's data.

3.2 Workshop 5: Prototype testing

Workshop 5 featured demonstrations of prototype solutions developed during different research projects. The MobilePass consortium tested a mobile device for comparing faces to passport images as well as for capturing fingerprints and matching them to those contained in the passport chip (see Figure 5). The ABC4EU consortium tested a portable device for examining visas with fingerprint verification capabilities (see Figure 6). The BODEGA consortium tested a prototype card game for travellers designed for enhancing cooperation with border guards during border-crossing procedures (see Figure 7).



Figure 5. MobilePass project prototype



Figure 6. ABC4EU project prototype

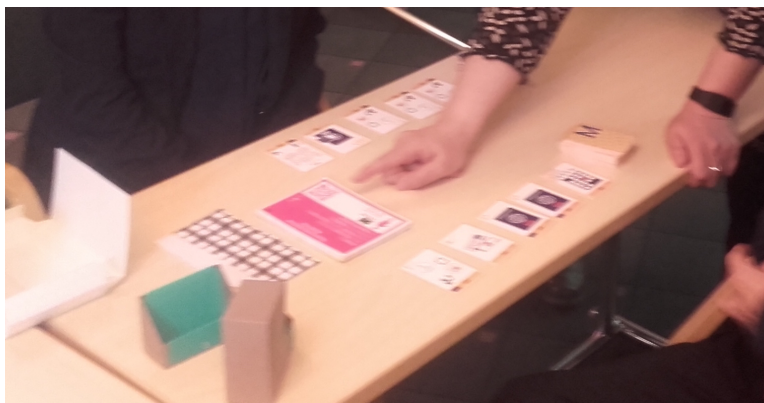


Figure 7. BODEGA project prototype

3.3 Workshop 6: ABC4EU External End User Advisory Board meeting

Workshop 6 hosted a meeting of the ABC4EU External End User Advisory Group. Access to the meeting was reserved to researchers and end-users involved in the ABC4EU project.

3.4 Workshop 7: Exchanges of best practices and free discussion

The final session of the event was dedicated to a group discussion on key questions raised by the European Commission. The insights emerged from the group discussion with regards to each question are summarised below.

Lessons learned from the projects and how the results can be exploited on the European level.

The participants highlighted the need to learn from past mistakes and tell others about them as a crucial step for the success of future research projects. They recognised the importance of having a clear understanding since the very beginning of the project of the nature of the solutions to be developed as well as of how these could be commercialised (e.g. in the form of products, consultancy services, etc.). To this end, it was recommended to have an exploitation strategy clear from the beginning of the project and, later on in the project, to get involved in activities specifically intended for helping researchers preparing the future uptake of research results (e.g. through participation in pitching events). Cooperation with the EC as well as with a pool of experts with the necessary knowledge in the commercial realm was mentioned as a potentially valuable initiative for improving the effectiveness of a project's exploitation efforts.

How the developed technology can be implemented as a European wide solution (including certifications, solutions, prototypes).

The participants acknowledged the fact that many of the solutions presented throughout the event target the same stakeholders and, as such, they may be seen as concurrent with one another. In order to harmonise the technological solutions being adopted, participants proposed organising joint pilot phases, hosting pilot testing of different technologies developed during different research projects. The aim would be to give end-users the opportunity to test different technologies in the same location, under similar conditions and using the same evaluation methods. This would lead to better benchmarking and would foster the identification of the key features necessary to ensure the most effective border control process possible. In addition to a joint pilot phase, participants called for further prototyping, with the objective of reaching a minimum TRL level of seven, followed by further tests with end-users. Participants stressed the fact that harmonisation cannot come only from the technology industry but requires active support from end-users. The establishment of certifications on border control technology solutions was proposed as a further means to induce different countries to rely on the same solutions.

How the legislation and their work thus far have been implemented in the projects, and how the outputs of the projects can be used at the European level – not national level.

During the various projects represented at the event, researchers had to work with many unknowns as to what the future legislation would be like. Researchers developed legal requirements based on existing legislation but keeping in mind that possible new requirements could come from new legislation. Projects like ABC4EU and FastPass created a list of legal requirements for border control technologies. Legislation was also taken into account during piloting work, with the aim to ensure pilots' compliance with border control and data protection legislation. In order to help law-makers improve the quality of their laws, a critical analy-

sis of existing laws and EC proposals was performed, with a special focus on consistency with the Schengen acquis and data protection legislation. Questions related to the interpretation of principles such as privacy by design and RRI as well as to the rights of travellers as data subjects were also addressed within the projects.

How the changing legislation can be implemented into the technology that is already in operational use, on cost-effectiveness, functions and any other relevant approach.

Participants stressed the need to perform impact assessments prior to the implementation of new legislation, both at EU and at Member State level, taking into account technical as well as operational aspects. A 'privacy by redesign' approach was also identified as a useful framework for introducing privacy by design principles into systems that are already in use. Privacy by redesign involves a proactive evaluation of how personal information is used and managed, combined with measures to systematically address gaps as these are identified. Concerning the development of new technologies, participants recommended the adoption of a modular design approach. One of the advantages of modular design is flexibility: it allows to upgrade certain aspects of a system (e.g. based on new legislation) without having to build a whole new system from scratch. Another benefit is cost-effectiveness, as modular design requires less customization and, therefore, may help reducing costs. A further recommendation concerned the creation of EU standards for technological solutions and procurement. Such standards could contribute to enhancing interoperability between technologies as well as to harmonising technology used by different countries. Greater collaboration between border control stakeholders was also mentioned as beneficial. A proposed solution in this sense was the establishment of an observatory responsible for monitoring the implementation of new legislation by Member States, bringing together various stakeholders, including EU legislators, law-enforcement agencies and technology providers.

Annex 1 – Joint BODEGA-ABC4EU Showcase Event Agenda

INVITATION

You are cordially welcome to

The Joint Showcase Event of ABC4EU and BODEGA projects

2nd – 5th of May, 2017

Venue: Levi Spa and Hotel, Finland

ABC4EU aims to harmonize border control technology in accordance with the Smart Borders legislation (<http://abc4eu.com/>).

BODEGA aims to enhance efficiency, border security and traveller experience taking into account human factors and ethical dimension (<http://bodega-project.eu/>).

The aim of the event is to expand the end user community of both projects, disseminate the results and validate and discuss the results. Cooperation between EU-funded projects is recommended by the European Commission. This joint event will provide you with a good overview on how the EU's changing legislation correlates with the preliminary results of two different projects.

We would like all participants to take part in the discussion. The European Commission asked the event to consider following guidelines within the event:

- *lessons learnt from the projects and how the results can be exploited on the European level*
- *how the developed technology can be implemented as a European wide solution (including certifications, solutions, prototypes)*
- *how the legislation and their work thus far have been implemented in the projects, and how the outputs of the projects can be used in European level*
- *how the changing legislation can be implemented into the technology that is already in operational use, on cost-effectiveness, functions and any other relevant approach*

Please find the preliminary programme below.



PROGRAMME

Tuesday 2nd May 2017

- 15:30 - 21:00** Bus transfers from Rovaniemi to Levi
15:30 First bus transfer leaves to Levi
18:15 Second bus transfer leaves to Levi
 Light snack box served in the bus
 Introduction to ABC4EU and BODEGA projects
 Ice breaking activities
NOTE: Each bus will include an organiser who will take care of that everyone signed for that bus via e-registration in onboard
- 17:30 - 21:00** Check in at the hotel
NOTE: The hotel registration sheets will be delivered for filling to the bus
- 20:30** Voluntary ice breaking activities (indoors, Attendees' own expense)
 Bowling available till 20.00
 Spa open till 22.00 (last entrance 21.00)
 Gym open till 22.00
- 21:30** Dinner (Attendees' own expense)
 Classic Pizza till 22.00
 Ahku A la carte till 22.00
 Scanburger & salad bar till 21.30

Wednesday 3rd May 2017

- 8:30** Opening Remarks
- 9:00** 1st Keynote Speaker
Keynote: *Reflecting the changing border security and border crossing scheme in Europe and / or in the EU / relating to third-country nationals and freedom of movement vs. securitization. / Automated Border Control in the European Union*
Mr. Ignacio Zozaya, Senior Research Officer, Research and Development Unit – Capacity Building Division, Frontex
- 9:40** 2nd Keynote Speaker
Key note: *Border automation in Finland, with an Asian hub and external Schengen Border*
Mr. Mika Rytkönen, Colonel, Finnish Border Guard



10:15	COFFEE BREAK
10:30	Discussion Mr. Harri Ruoslahti, Laurea University of Applied Sciences
11:00	Workshop 1: Lessons learnt from Automated Border Control facilitation projects ABC4EU BODEGA Fastpass Mobilepass Exploitable results on the European level
13:00	LUNCH (Expenses covered by the organisers)
14:15	Workshop 2: Technology as a European wide solution Presentation of facial recognition mock-up to support border guards' decision making, presented by TBS (BODEGA) Presentation of the work on mobile device technologies, video-based technologies, questionnaire for the end-users by AIT (BODEGA) Technology solutions in ABC4EU's proof-of-concepts presented by INDRA (ABC4EU) Certifications, Solutions , Prototypes
15:45	COFFEE BREAK
16:00	Workshop 3: Field Studies and Proof of the Concept -validation of the results Presentation of the results of field studies conducted at various border crossing points and introduction to related models presented by CEA, UIC, TCS, VTT (BODEGA) & Validation results from the ABC4EU pilots, PricewaterhouseCoopers, ABC4EU
18:00	Wrap up, end of day
21:00	DINNER (Expenses covered by the organisers)

Thursday 4th May 2017

08.30	Review on Wednesday's agenda 3rd Keynote Speaker Key note: Human factor in Border Control (TBC)
09:00	Workshop 4: Ethics / Responsible Research



Presentation of results to the experts and open discussion
University of Namur, BODEGA
Eticas, ABC4EU

10:15 COFFEE BREAK

10:30 Workshop 4 continues

12:00 LUNCH (Expenses covered by the organisers)

13:15 Workshop 5: Prototype Testing
Playable prototype for enhancing cooperation with the travellers presented by UBIUM
Mobile device presented by ATOS

14:30 COFFEE BREAK

14:45 Workshop 6: ABC4EU External End User Advisory Board (for more information contact PwC)
Organised and responsible, PricewaterhouseCoopers

&

14:45 Workshop 7:
Exchanges of best practices / free discussion

16:30 Reviewing results, discussion

17:00 End of day

20:00 Dinner in Ahku restaurant (Attendees' own expense)

Friday 5th May 2017

8:30 Wrap up of event, next steps

10:30 Check out

10:45 Bus transfer to Rovaniemi Airport

PRACTICAL QUESTIONS CONCERNING THE EVENT

Hotel bookings are preliminarily made by Laurea University of Applied Sciences to Levi spa and hotel. All participants have been kindly asked to confirm their participation via e-registration system. Please let the coordination team know if you have not registered.

All inquiries concerning accommodation, flights or special diets/food allergies are requested to be informed to Mrs. Ursula Ursin-Ralli, ursula.ursin-ralli@laurea.fi

Do not hesitate to contact Ms. Laura Tarkkanen laura.tarkkanen@laurea.fi, tel. +358406692611, ABC4EU project manager for Laurea University of Applied Sciences or Mr. Alessandro Bonzio, Alessandro.bonzio@zanasi-alessandro.eu, tel. +393335053983, Bodega Dissemination Coordinator, for Zanasi & Partners, for further information regarding the programme.

DRESS CODE

Casual during the event. Please do remember the weather conditions in Lapland! Please be also prepared for possible voluntary outdoor activities.

ADDITIONAL INFORMATION

The venue hotel has a gym, 17 pools and a sauna, and other activities which are available for all guests at their own expense. Levi offers a great opportunity to go skiing (downhill) at your own expense, and they estimate it is still available in May. You may leave to the downhill skiing slopes are some 3km away.

Further information on our hotel: <http://www.levihotelspa.fi/en/>

Further information on activities: <http://www.levihotelspa.fi/en/spa-wellness/>

Further information on Levi: <http://www.levi.fi/en/home.html>

Looking forward to seeing you in Levi!

