

BODEGA: innovative, ethically and societally compatible socio-technical solutions for border control context

Veikko Ikonen, VTT Ltd

Intelligence and innovation at the border

SDW 2018

Monday 25th June 2018





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Proactive Enhancement
of Human Performance in Border Control

BODEGA: innovative, ethically and societally compatible socio-technical solutions for border control context

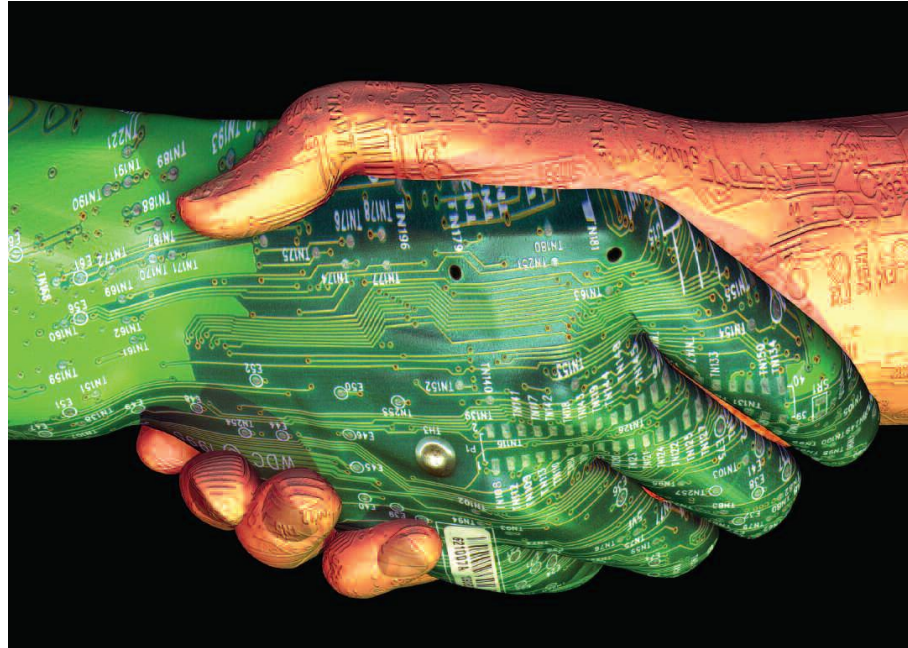
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RRI (incl. Ethics) and technology, applications and services:



Melvin Kranzberg's (1986) first law of technology
"Technology is neither good nor bad; nor is it neutral"

My Profile: RRI expert and Research Integrity Adviser (RIA) at VTT

- **Veikko Ikonen (at VTT 2001-)**
- Senior Scientist, Project coordinator, Team: Foresight and safety culture, Tampere, Finland
- **Research Focus**
- Human Driven Design and Responsible Research and Innovation (RRI projects: KEN, Guardian Angels, ETICA, GREAT, Responsible Industry, PROEIPAHHA, SniffPhone, BODEGA, NewHoRRizons, SmartCom)
- **Other Duties**
- Board member of Corporate Responsibility Network FIBS (Finnish Business Society) 2014-16, VTT contact person for FIBS
- Member of Ethics Committee of the Tampere region (2010-)
- RRI EU H2020 coach at VTT

RIA (HTK) Duties

- Confidential contact point for discussions about research integrity
- Support Responsible conduct of research in organization;
<http://www.tenk.fi/en/responsible-conduct-of-research>
- Advise in cases of doubts about misconduct and disregard and gives guidance about procedure and actions if needed
- Contact person for Finnish Advisory Board on Research Integrity (TENK)

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Finland**



VTT Technical Research Centre of Finland Ltd

- VTT is one of the leading research and technology organisations in Europe.
- We use our scientific and technological excellence to provide innovation services for our domestic and international customers and partners.



* Loikkanen, T. et al. Roles, effectiveness, and impact of VTT. Towards broad-based impact monitoring of a research and technology organisation. 2013. VTT, Espoo. VTT Technology 113. 106 p. + app. 5 p.



Net turnover and other operating income
269 M€ (VTT Group 2016)



Unique research and testing infrastructure



Personnel 2,414
(VTT Group 2016)



Wide national and international cooperation network

What is RRI?

- “Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society).” (Von Schomberg, 2011).
- “RRI is an inclusive approach to research and innovation (R&I), to ensure that societal actors work together during the whole research and innovation process. It aims to better align both the process and outcomes of R&I with the values, needs and expectations of European society.” (European Commission, 2013)

RRI keys:

- **Engagement** (public, stakeholder)
- **Open Access** (dissemination, exploitation of results, transparency, open innovation)
- **Gender Equality** (diversity)
- **Ethics** (reflexivity, anticipation)
- **Science Education** (capacity building, mutual learning)
- **Governance** (tools, protocols, procedures, actions)

RRI O's

- **Open Innovation**
- **Open Science**
- **Open to the World**

Why sustainability, why ethics, why **BODEGA** **RRI?**

How Sustainability creates business value



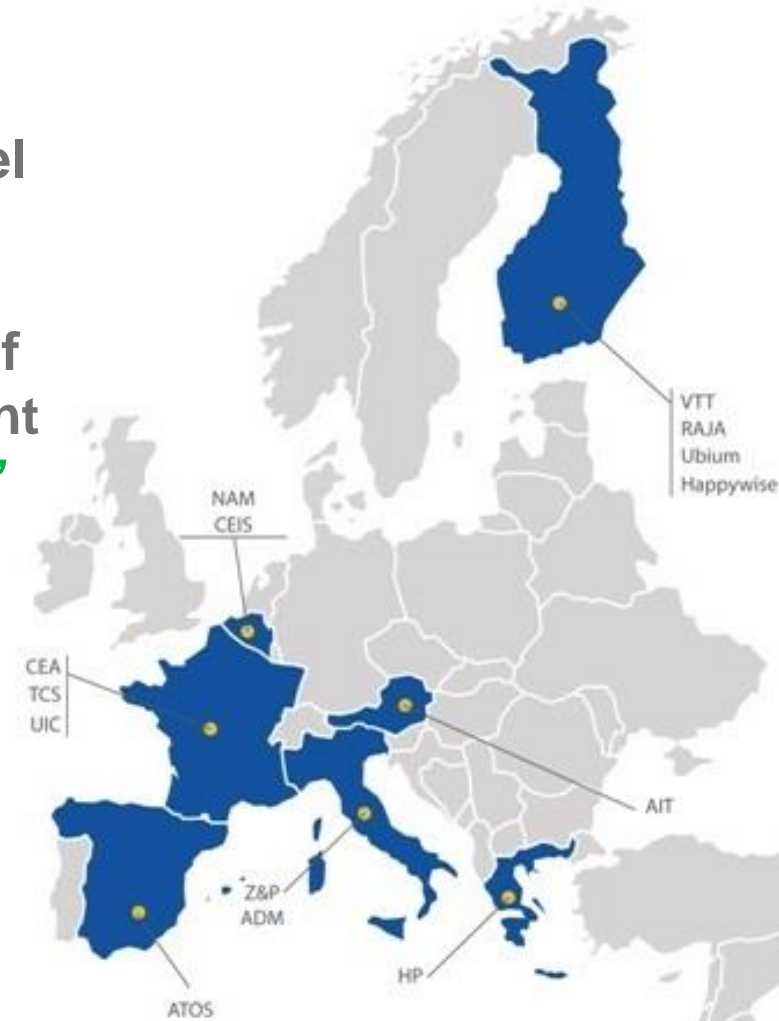
From Laszlo, C. (2003) *The Sustainable Company*. Island Press



BODEGA - objectives

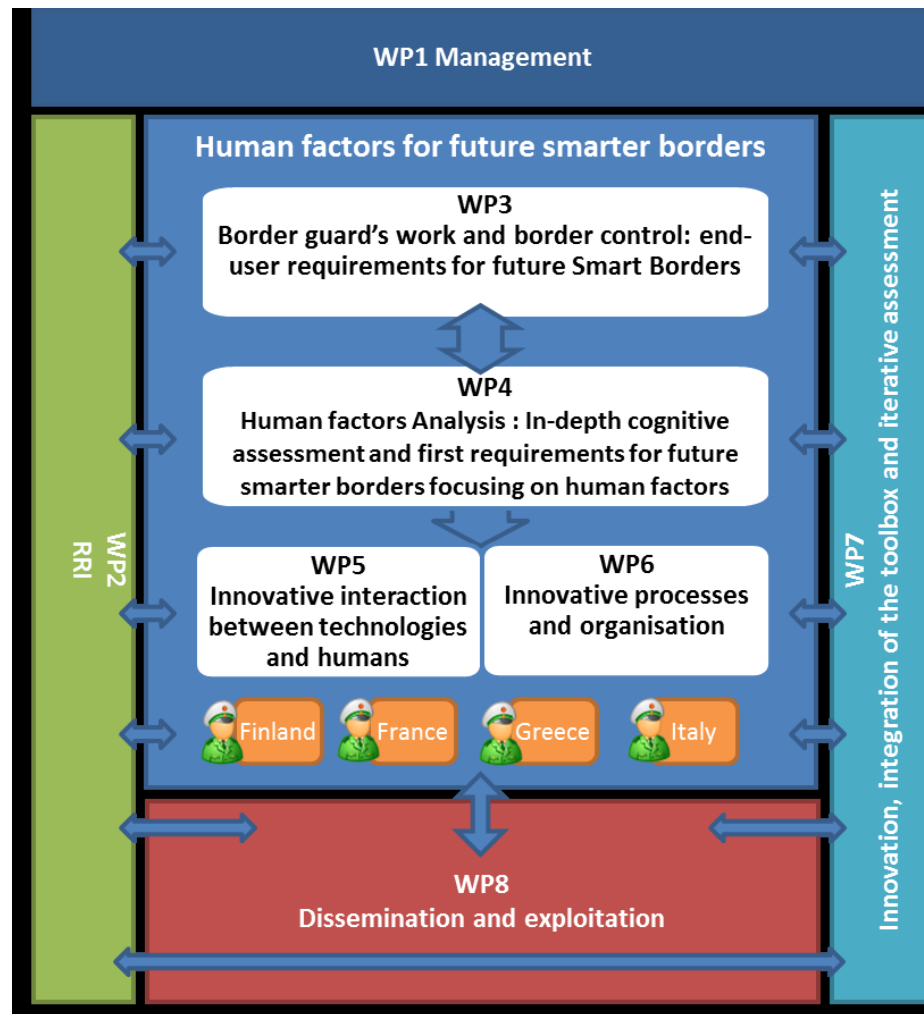
BODEGA project will **investigate and model** Human Factors in border control to provide **innovative socio-technical solutions** for enhancing border guards' performance of critical tasks, support border management decision-making, *and optimize travellers' border crossing experience.*

BODEGA will develop a **PROPER toolbox** which integrates the solutions for **easy adoption** of the BODEGA's **results** by stakeholders in border control.



BODEGA Objectives and Workflow

- Developing an approach with ethical, societal and legal considerations into a set of human, organisational and technical factors
- Constructing a greater understanding of border guard's work and border control (future smart borders)
- Gathering new knowledge about psychological and organisational aspects
- Taking into account also traveler perspective

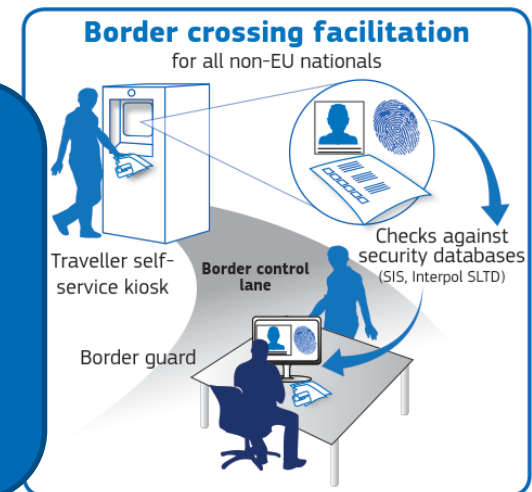


Vision for future Border Checks

More information, deeper checks, more biometrics -> more technology

- Stronger and Smarter Borders, and Information Systems - accepter (6/2017)
- ETIAS European Travel Information and Authorisation System (11/2016)
- Passenger Name Record (PNR) Directive (4/2016)
- Proposal to enforce systematic controls on all travellers crossing EU external borders (European Border and Coast Guard (10/2016)
- Improvements to the Schengen Information System (SIS) (12/2016?)
- Action Plan to improve the security features in travel documents.

EU “Stronger and smarter Borders”:
Regulation on the establishment of an Entry-Exit System to speed-up, facilitate and reinforce border check procedures for non-EU nationals travelling to the EU.



The 5 Border Management core tasks

Document

Are the documents authentic and valid ?

Eligibility

Is the person allowed entry based on the information on the document ?

Identity

Is this the person on the document ?

Purpose

Has the person a credible justification and means of subsistence ?





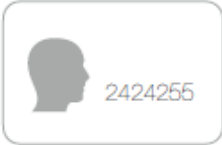
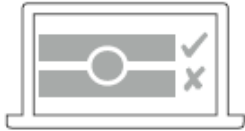

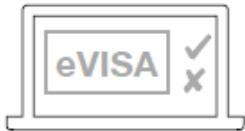






Threat

Is the person not a threat - known registered, unknown behaviour ?



The 5 Border Management core tasks

Document	Technical verification
Eligibility	Visa / Database check
Identity	Biometrics verification
Purpose	Interview / Behavioral assessment
Threat	Behavioral assessment / Database

						
		+	-		+	-
Document		Non-standard cases Language check Information in context Skill remains needed	Learning curve Lack of return of experience Difficult to verify / reproduce		Speed of process Performance consistency Technical control	Non-standard cases Damaged documents No consistency check - Language
Eligibility		Information in context Travel history visible	Possible calculus mistake Time needed to decipher stamps		Accuracy Speed Easy transmission of data among MS	Ergonomy Non-Standard Visas Cyber attacks / bugs
Identity		Super recognizers Non-standard cases Check consistency ID / person	Possible mistakes Fatigue Inconsistency of performance		Accuracy Speed Performance consistency Degree of certainty	Non-Standard cases Cyber attacks / bugs Database designed (centralized or not)
Purpose		Customized questions Intuition Traveller appearance Traveller story evaluation	Decision with insufficient information Time needed to verify information		Data collection ? Verification of claims ?	No interaction with traveller Automating process gives clues on BGs methods
Threat		Customized questions Behavioral analysis Gut feeling	Cognitive biases Small amount of parameters considered		Amount of data processed Patterns detection	Technology not mature No interaction with travelers

Towards future Border Control

**Conformity
verification**

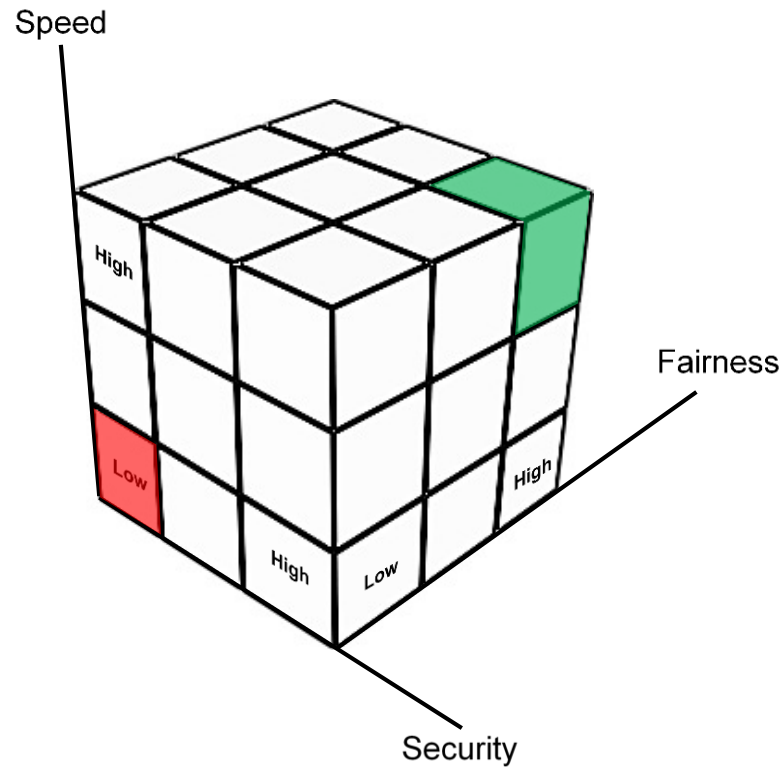
Technical verification
under human supervision

**Intentions'
assessment**

Human analysis
with support from machines



Travelling experince?



Travelling experience?

- Speed – the requirement for BGs to keep up with processing high traveller flows (based on the projections of the EC for an increase in cross-border mobility and rise in the volume of regular travellers by 2030).
- Security – the requirement to keep the border an effective filtering mechanism in the overall security and law enforcement architecture (based on the fading distinctions between internal and external security and the increasing importance of new global threats).
- Fairness – the recent trend in the governance of border control to elevate the level of professionalism by taking on board and promote sensitivity to fundamental rights issues.

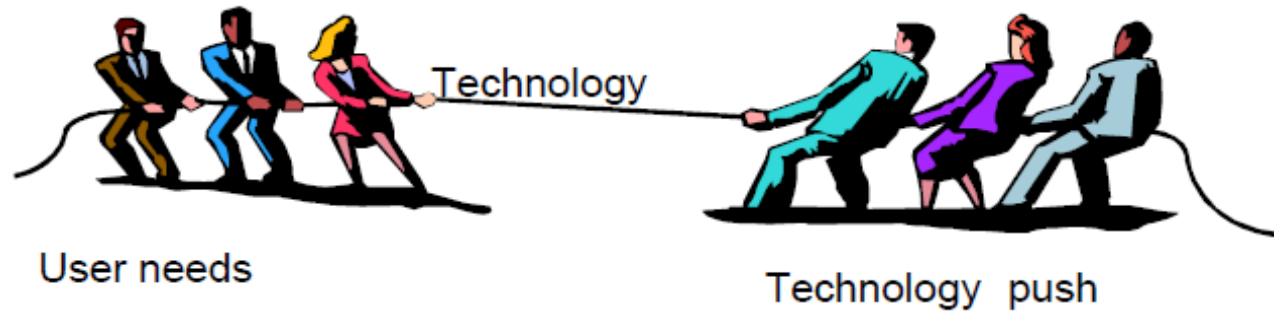


Future borders – EU proposal call

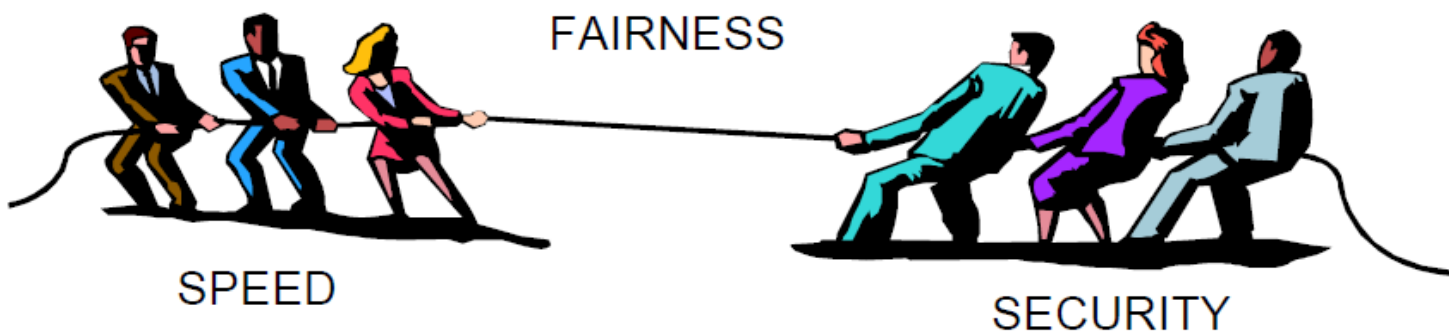
- For the traveller it would be ideal to cross borders without being slowed down. It is indeed likely that, in the next 10 years or so, technologies make it possible to implement "no gate crossing point solutions" that allow for seamless crossing of borders and security checks for the vast majority of travellers who meet the conditions of entry, and make sure that those who do not fulfil such conditions are refused entry.
- There is a broad variety of technologies and systems including information systems and (networks of) sensors that will become available to support border checks based on risk-assessment methods. Some are to be deployed in the vicinity of border crossing points, others can be mobile and used to check travellers data along his/her journey.
- However, in the intensive use of technologies that this will require bears the risk to invading people's privacy, and the societal and political acceptance of technologies for "no gate solutions" is required prior to their implementation.

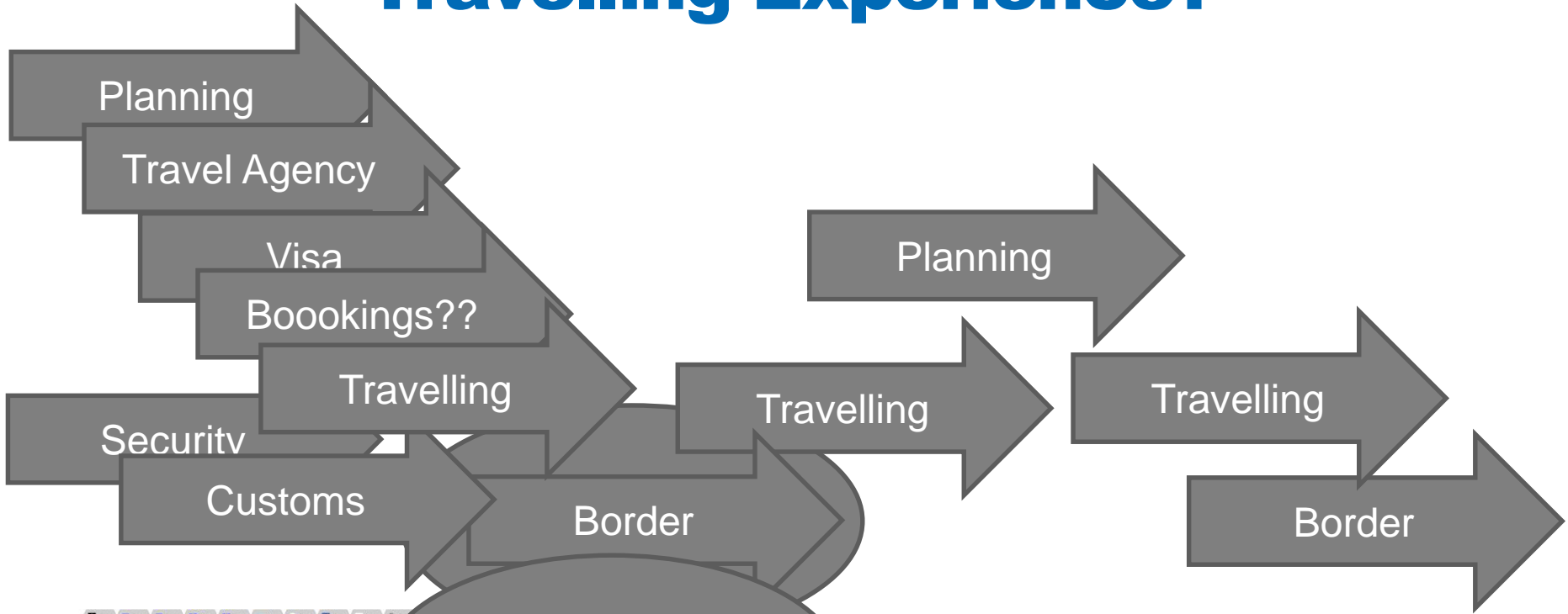


Design tensions

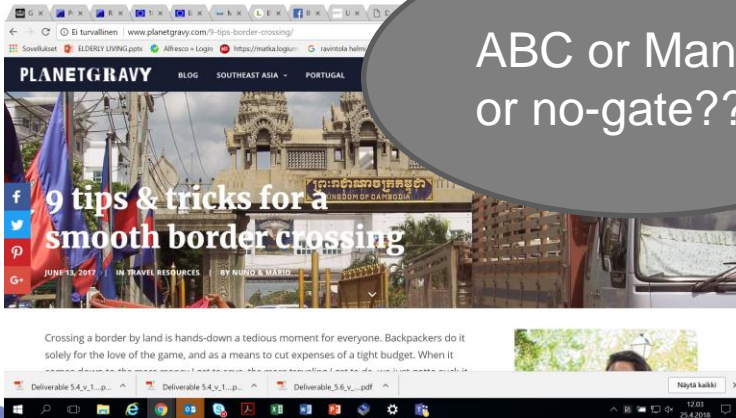


Tensions between objectives







ABC or Manual
or no-gate????





<https://www.adventure-journal.com/2016/05/17-tips-for-a-smooth-overland-border-crossing/>

PROPER TOOLBOX draft







Full Name

WELCOME TO DATABASE!






ABOUT THE PROPER TOOLBOX


The PROPER Toolbox will provide knowledge, best practices, national and European experience, research results that will be used by members to find the relevant information for help them to decision making and improve the whole organisation and human factors conditions. [Read more...](#)

Human factors in border control




description...
123 documents

Border control work




description...
123 documents

Future border guard work




description...
122 documents

Innovative interaction




description...
6 documents

Innovative border management and processes




description...

Category N




54645 documents

My favourites




- some doc [pdf]
- some doc [video]
- some doc [video]

My latest



- some doc [pdf] [video]
- some doc [video]
- some doc [pdf]


Most read




- some doc [pdf]
- some doc [pdf] [video]
- some doc [video]

Tag cloud

Airport Paris Schengen
ABC Maritime Greece





Proactive Enhancement
of Human Performance in Border Control

Copyrights

BODEGA (<http://bodega-project.eu/>)

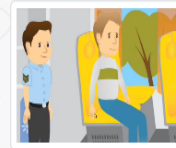
- The **PROPER** toolbox will be co-designed and thoroughly validated with relevant stakeholders and end-users.
- The work will be carried within the framework of Responsible Research and Innovation to ensure the ethical and societal compatibility of the project work and provided solutions as well as emphasis on the foreseen future with smarter borders.
- BODEGA validated, modular and flexible toolbox will enhance the performance of border control stakeholders - borderguards, border authorities and citizens - to create more secure, efficient and effective border crossing, focusing on the borders between Schengen agreement and external countries.



Border Control Authorities

CodeGame

Simulation type education game running in web-browser. CodeGame is created in this project as proposal for using games in education of border guards.



Training Risk analysis Mobile devices Border Control Authorities

Recommendations for future smarter borders focusing on human factors

Border Control Authorities

Recommendations for traveler cooperation

Border Control Authorities Traveler Associations Traveller experience Biometrics Data protection

Decision-Support System for Smart Borders

Border Control Authorities

Traveler Associations

Business

RRI Ethics Societal issues

Data protection Legal

Research ethics Methodologies

Cognitive analysis

Task modelling Activity models

Human factors

Design guidelines

Document verification

Biometrics Risk analysis

Mobile devices ABC

Traveller experience

Decision making Training

Operational development

Management Industry

- Doing more **field tests** to adapt technology to operational needs
- Relying more on **existing hardware** & developing state-of-the-art software
- Adapting solutions to operational environment - no universal solution
- Developing human / machine interfaces taking into account the **actual needs of the user**
- Maintaining the **human component** in the process - threat assessment
- Testing and **gathering lessons learned** before full deployment of solutions



THANK YOU FOR YOUR ATTENTION!

Time	Seminar contents	Presenter
KNOWLEDGE THEATRE, 2ND FLOOR		
The BODEGA project – PART 1		
10.30 – 10.40	"BODEGA project introduction"	Veikko Ikonen (VTT)
10.40 – 11.10	"End user needs and requirements for future smarter borders"	Christine Mégard (CEA), Virginie Papillault (UIC)
11.10 – 11.35	"Optimising the tandem between document inspection systems and humans"	Franz Daubner (AIT)
11.35 – 11.55	"Identity verification with fingerprints"	Arndt Bonitz (AIT)
11.55 – 12.15	"HMI design for mobile border control solutions"	Arndt Bonitz (AIT)
12.15 – 12.35	"Enhancing the border control process with video-based technologies"	Andreas Kriechbaum-Zabini (AIT)
KNOWLEDGE THEATRE, 2ND FLOOR		
The BODEGA project – PART 2		
14.30-14.55	"Big data analytics as a support tool for risk analysis"	Alessandro Bonzio (Z&P), Raul Sevilla (ATOS)
14.55-15.20	"Innovative border control processes and organisation"	Carolina Islas (Ubium), Laura Salmela (VTT)
15:20-15.45	"Changing borders, changing (in)security"	Anaïs Rességuier (Sciences Po)
15:45- 16:05	"Demonstrations"	tbc

**BODEGA stand at SDW
Exhibition 26th and 27th**

<http://bodega-project.eu/>



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