user is encouraged to construct a well-evidenced policy proposal. The environment accentuates critical facets of the policy proposal in a structured manner, and thus helps the user to avoid typical biases that are associated with policy design.

In this manner, the BESECURE platform facilitates scientific substantiation, practice-based justification and data-driven validation, and contributes to stronger, more evidence-based policy designs.

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MULTI-CRITERIA EVALUATION FOR AUTOMATED BORDER CONTROL

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Keywords: Aviation security, border security, ABC-gates, e-gates, usability, user acceptance, biometric identification, privacy, evaluation, requirements, criteria, stakeholders.

1 INTRODUCTION

The requirements on border control vary largely between the different stakeholder groups involved in the process. While many stakeholders, e.g., border guards and airport operators, differ in the prioritization of existing requirements, other stakeholders might even introduce new conflicting requirements. For an overall measurement of usability and acceptance, a lot of different criteria are to be analyzed based on the available measuring means and processes.

To verify the identity of passengers, biometric properties, e.g., a picture of the face or fingerprints, are used for the comparison between the really measured (and observed) ones and the represented ones stored in the passenger's travel document. To improve the control process and to cope with the increasing number of travelers, Automated Border Control (ABC) systems have been introduced at several airports and some seaports in Europe. The FastPass project funded by the European Union has the objectives to develop a reference system for automated border control, to harmonize the usage of systems and processes, and to evaluate usability and acceptance by all involved users and responsible authorities.

To consider all relevant stakeholder groups and to analyze their requirements on the border control process, a stakeholder management system has been set up by Fraunhofer IOSB within the FastPass project. Comparable to a customer relationship system it stores and administers all partners as well as all performed interactions with them.

The resulting set of constraints and requirements of all stakeholders cannot be fulfilled. Using a metaphor, this is comparable to a ribbon model with restricted length and the necessity to cover certain points of a path: Not every point can be reached, the restricted length of the ribbon forces to compromise certain needs. In order to get a suitable system, the fulfillment of the respective requirements has to be reduced to realistic properties. In addition, the derived set of requirements on the different levels of the control process is covered by the respective criteria and their corresponding set of measurements which is possible inside the project.

A layer model for the weighting and the dependent analysis steps has been defined. For the analysis of the criteria and their fulfillment levels, a paradigmatic cycle has been realized in order to define, analyze, visualize and interpret the results of the criteria fulfillments. Possible optimizing measures can then be the progressive development of the system components, the structure and parameterizing of the criteria and the respective measurement procedures, or even the reconstruction of the stakeholder needs together with the resulting requirement definitions.

2 THE FRAMEWORK FOR THE EVALUATION

The stakeholder groups and their respective main interests regarding Automated Border Control are shown in Tab. 1:

Stakeholder group	Interests
Authorities	Security, quality, cost-effectiveness
Border guards	Usability, speed, effectiveness, reliability
Facilities	Traveler experience, cost-effectiveness, space effectiveness, adaptability to infrastructure, traveler flow (speed)
Manufacturers	All interests of the others, product development and manufacturing economics and design for "X" factors
Travelers	Speed, convenience

Table 1: Classification of stakeholders and their interests.

Different interests and the respective requirements and their priorities have been discussed and defined in a workshop with specialists from all areas in order to derive an appointment, ranking and weighting for the requirements.

A physical model for the interaction between the fulfillment levels of the respective requirements for the stakeholder groups is the ribbon model which provides gliders with cable roles representing the fulfillment levels and a ribbon the length of which represents the complete amount of available resources. In general, it is not possible to fulfill all requirements to the complete acknowledged level. Thus, the resources for every required property that shall be added have to be taken away from one of the others if it shall not lead to increased costs, weight and space requirements.

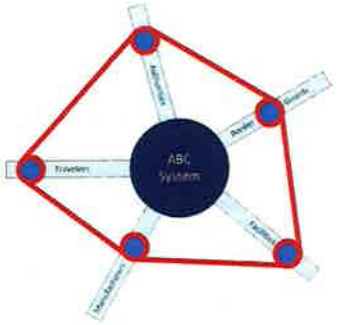

Figure 1: Ribbon model for the fulfillment of stakeholder needs.

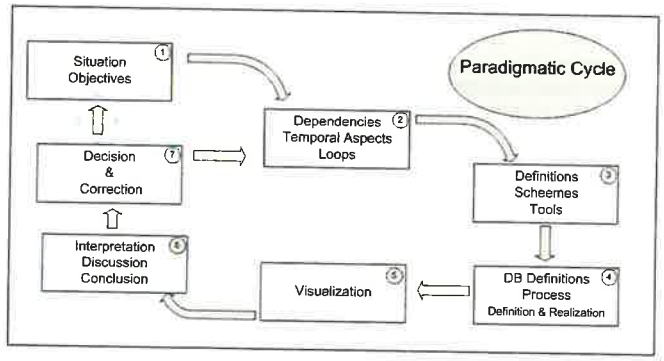

Figure 2: The paradigmatic cycle.

3 EVALUATION LOOPS

In order to evaluate and compare different systems, scenarios or measuring campaigns, there is the possibility to run through all requirements, criteria or measuring results. The relations between requirements, criteria and measuring rules are: There has to be at least one criterion for a requirement or more, there has to be at least one measurement for each criterion. Each criterion may relate to more than one requirement and each measurement may relate to more than one criterion. Requirements and criteria are given weighting values representing the importance of them. These values vary between the different stakeholder groups. That means that the evaluation results may differ between the groups and also differ dependent on the choice of the loop. Additionally, there are basic requirements (and criteria) which are not weighted as they represent a MUST for the success. If one of them is not fulfilled, the evaluation is finished with the result of zero.

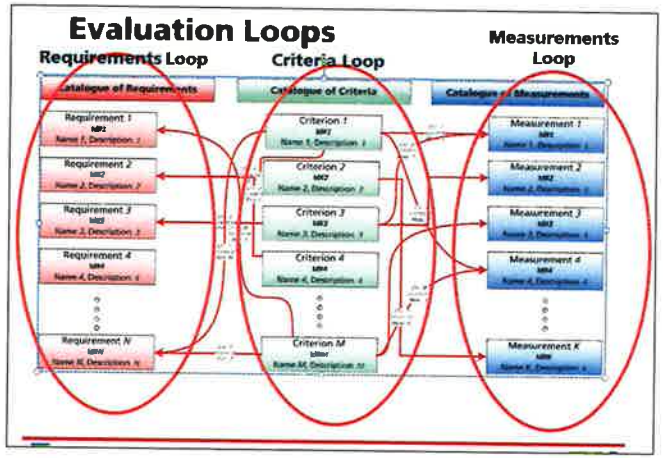

Figure 3: Evaluation loops.

4 DISCUSSION

The usability and functionality of ABC gates can only be measured by a complex set of procedures for data acquisition combined with a comprehensive framework of requirements, criteria and measurements. The different needs and interests of the stakeholders vary in a wide range and have to be taken into account within the evaluation framework. For the three scenarios within the FastPass project, at an air border (Vienna Airport, Schwechat, Austria), sea border (Port of Mykonos, Greece) and land border (Moravița, Romania), there will be several measuring campaigns, observations, interviews and questionnaire actions. This will lead to a wide range of evaluation loops which will enable the project team to compare the reference solution with former solutions, the scenarios between each other, the evaluation results between the respective stakeholder groups and – finally – an overall evaluation of the FastPass system. The evaluation framework, the collected requirements, criteria and the description of the measuring procedures will be presented at the Future Security 2014 in Berlin.

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STAND-OFF BIO DETECTION – A REALISTIC OPTION?

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Abstract

Biological agents have become an increasingly important potential threat for both military and civilians. As they are relatively easy to produce and disperse, an early warning of a spread of biological agents is indispensable and fundamental to establish a timely defense and to maintain and support effective operability of security forces and civil protection. Furthermore, it would enable them to take protection, reaction and response measures, such as, for example, evacuation, decontamination or putting on protective equipment. Additionally, stand-off bio detection would be a useful tool for mapping of affected areas. The SoBID project, funded by EDA and conducted by Fraunhofer INT in cooperation with Isdefe and Ibatech Tecnología, aimed at delivering insights in potential future technological solutions for stand-off bio detection within a timeframe of 10 to 20 years from now. The approach chosen for this study is based on desktop research on the state-of-the-art of technologies and systems related to stand-off bio detection, combined with an information exchange workshop. On this basis, expert interviews were conducted. Based on this research, two distinct roadmaps were elaborated, taking into account technological feasibility, operational requirements, cost factors, and commercial availability of components.

Keywords: Stand-off detection, bio detection, laser, spectroscopy, horizon scanning, technology forecast, technology roadmaps.

1 BACKGROUND

Biological agents have become a potential threat for both military and civilians. An early warning of a dissemination of biological agents is indispensable and fundamental to establish a timely defense, to maintain and support effective operability of security forces, and to initiate civil protection measures.

The SoBID (Stand-off Bio Detection) project funded by the European Defence Agency (EDA) aimed at delivering insights in potential future technological solutions for stand-off bio detection within a timeframe of 10 to 20 years from now. To achieve this, the project team checked the scientific plausibility of technological stand-off solutions proposed in the context of bio detection. The approach chosen for this study by Fraunhofer INT together with two Spanish partners, Isdefe and IBATECH Tecnología, was based on desktop research on the state-of-the-art of technologies and systems related to stand-off bio detection, combined with an information exchange workshop and complementing expert input, e.g., through interviews.