D7.2 Training curriculum in societal security for engineers and designers

This project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement no 313288.
Abstract:

The deliverable is an educational curriculum on societal security tailored for designers and engineers. It was developed in close cooperation with SOURCE partners having expertise in the area of security, technology and design to provide insightful materials for the target audience. The course was introduced online in the format of self-paced course. It corresponds with all pedagogical standards, including self-assessment and active learning tools, in addition to the elements targeted at increasing critical thinking in the field in question.

**Contractual delivery date:** M54

**Actual delivery date:** M54

**Version:** 1

**Total Number of pages:** 37

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**Dissemination level:** PU
Executive Summary

The VUB-IES coordinated task 7.2. that was targeted at producing and delivering a teaching curriculum for engineers and designers involved in the development of security technologies. The work on the task unfolded in three stages: 1) preparatory stage 2) curricular design stage and 3) dissemination. Together with five project partners, namely, FOI, Vicesse, EOS, Tecnalia and TNO, the VUB prepared the ground for the curriculum to take off the ground. Specifically, 1) a user needs analysis was conducted via an online survey targeted at academic experts and practitioners in the field, and 2) a workshop with project partners was organised in Brussels to focus on aims and learning outcomes, to develop a curriculum, and to design educational modules. Each partner contributed to the development of the curriculum by providing written input. Since the theme of the course is rather novel, the decision was taken to produce reading materials to draw an explicit link between societal security and technological studies. Exactly these materials, based on the competencies of each partner, were put in core of the curriculum. The finalised curriculum was brought to the online learning platform Canvas and was designed as a self-paced course that corresponds with relevant pedagogical standards. The course offers an introduction to and gives an overview of the topical issues in the field, such as security and privacy, development of innovation and civil participation in security design. The course includes a variety of assignments based on a clear structure and easy to follow navigation. Interactivity of the content was one of the key elements in focus, therefore an additional video-block and discussion forum were offered to students taking part in the course.
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1. Introduction

The SOURCE Description of Work (DOW) sets up the primary objective of T7.2: to produce and deliver teaching curriculum for engineers and designers involved in security in the development of security technologies. The task partners were assigned as follows: FOI, Vicesse, EOS, Tecnalia and TNO, whereas VUB acted both as a task coordinator and a contributor.

Together with project partners VUB designed a curriculum for the educational course and made it available as an online course based on self-paced learning. The major intention was to develop high quality educational materials, which would not only provide an insight into all stages of security design and development, such as: Understanding of the problem and problem definition, ideation, development and testing, but would also provide a broader overview of societal impact, citizen’s involvement in design and the most recent trends in security innovation – which makes it possible to accentuate the societal security and technological design nexus. The course followed relevant academic standards, such as: pedagogy-based methodological approach, professional orientation, formulation of relevant skills, evaluation, assessment and diverse interactive content. All task partners, as planned, contributed to development of the content with their unique knowledge and expertise to make up-to-date educational materials in line with novel trends in the field of engineering and societal security. The outcomes can truly be called pioneering since the societal security approach was applied to the field of technology-based design for security solutions.

The final course curriculum targeted at: a) students in disciplines broadly related to design and engineering, b) educators who wish to use the content as a source of inspiration and c) all interested individuals. The geographical focus included orientation to the EU audience, although the content is equally applicable for the target groups outside the EU, for instance, for the ones looking for ideas for comparative research.

The course consists of six study modules, which represent the topics chosen and elaborated by partners according to their expertise in societal security technology and design in cooperation with educational professionals. Each module encompasses: a) reading material, b) corresponding pedagogical tasks and analytical exercises, and c) assessment tools. All the partners worked together on developing structural,
comprehensive and easy to grasp content that would increase knowledge, deepen professional expertise and form new skills. The course is made available on a Canvas educational platform through the access via the SOURCE website.

2. Preparatory stages

Preparatory work unfolded at 2 stages:

Stage 1. In order to get input from perspective experts in the field, VUB conducted an online survey that was sent to a large group of academics (professors and PhD researchers) in Engineering and Design as well as practitioners involved in trainings. The survey consisted of 6 questions that more specifically looked at: 1) what type of knowledge the experts in the field are missing regarding society and security in engineering studies, and if there are any gaps to fill in; 2) if there was interest in the course being prepared by the project team and willingness to further collaborate and test the course material once the content is fully developed and made available via a freely accessible online virtual learning platform. After the completion of the survey, a report was produced by VUB (see Annex 1). The report clearly indicated topics that were of interest to respondents (e.g. environmental implications of engineering or technological innovation and privacy) and the general willingness to use the future course materials. The outcomes of the survey were communicated to project partners at stage 2 during the workshop and taken into consideration for final production of the content.

Stage 2. Following a series of preparatory Skype meetings between partners where planning and content discussions took place, an initial workshop for task partners was organised on 26 November 2015 in Brussels to cover the following objectives: 1) to come up with a common understanding of societal security in relation technology, design and engineering 2) to discuss the precise topics related to societal security design where the partners hold most of their expertise and 3) to have a preliminary design on the learning content and its aim and components and 4) to produce a plan of further action (for minutes of the workshop, see Annex 2). The workshop was organised in a format of a group discussion, individual presentations followed by the presentation of a keynote. The planning matrix activity (Annex 3) was circulated to the partners for the structural responses on identification of potential pedagogical output. The workshop resulted in enrichment of the content for the targeted course. Specifically, after the workshop, the list of thematic outcomes to be delivered by the partners was sharpened in collaboration
with them and covered the following:

2. FOI: Security Innovation
3. EOS: Societal Impact in the Use of Surveillance Technologies: Privacy VS Security
4. VICESSE: Societal Impact Assessment
5. TNO: Citizen Participation in Societal Security
6. TECNALIA: Societal Security and Living Labs

In early 2016 most of the unclarities were resolved and the actual work on the course content got off the ground. In April 2016 VUB requested the structural output from all task partners in order to proceed with the actual design of the course curricular. Precisely, the partners were asked to prepare their contribution based on the following format:

1. Text on the topic (academic literature and practical examples), 5-8 pages with chapters and subchapters;
2. Academic references and suggested reading (articles, documents, internet sources etc);
3. Education tasks for students (2-3 tasks), such as scenarios increasing creative thinking, questions and other assignments;
4. Multiple choice test as assessment tool (8-10 questions with answers out of 3 choices, where one is a right one);
5. Glossary (8-10 terms and definitions).

The structure of the contribution was intended to be merged into a holistic course consisting of modules. This structure implies more flexibility and freedom, meaning that the potential end-users of the curriculum (students) have their liberty to take all the modules or select only those that they are mostly interested in.

3. Visualization of the content

Having experience with online Massive Open Online Courses (MOOC) courses, VUB made the decision to place the course on the Canvas Platform: https://canvas.instructure.com/login/canvas (the course is
available here: https://ies.instructure.com/courses/51. Other online educational platforms were explored, such as the European MOOC Emma, EIT Digital and Course sites by Blackboard, but the Canvas was the ultimate choice as it serves as an innovative functional online environment allowing to produce and configure customized educational content at a high professional level. More specifically, it offers an access to a variety of educational designing tools, such as: course modules, quizzes, tables, pictures, assessment sheets, or even video chats. The platform is quite intuitive and easy in usage compared to other MOOCs (Blackboard or EMA). Canvas has been successfully tested and used by the VUB (IES) for running online postgraduate courses. Access to the platform is free of charge for developers. Students can also use the platform free of charge for self-paced learning courses. Coordinating a course, implying managing students, guiding them through the course, reviewing and evaluating their assignments is, however, subject to charges. Therefore, a decision was made to develop a curriculum based on self-paced learning method and provide interested parties free access to all materials. Placing the course on Canvas does not impact copyright of the developers, which was another important issue to keep in mind while searching for the best environment for the course curriculum.

The technical course instructions on how to navigate through the platform, submit assignments and participate in discussions are provided for the course users.

3.1. Target group

The course is primarily designed for Bachelor and Master-level learners. It is also suitable as an additional source of inspiration for educators in Engineering, Technology and Design as well as for all interested individuals.

3.2. Course objectives

The course is targeted to meet several objectives. Firstly, it starts by gradually introducing students to the basic concepts in societal security. It should not be taken for granted that the students with background

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1 The link allows to take a role of the observer in the course with some limited functionalities (it is impossible to take quizzes, participate in discussions etc). For the purpose of review of the full version of the course, access to the platform can be reached via: https://ies.instructure.com/ User name: sourcennetwork2015@gmail.com password: guest2018
2 http://project.europeanmoocs.eu/
3 https://www.eitdigital.eu/
4 https://www.coursesites.com/
in Science necessarily possess knowledge in societal security as a concept derived from International Relations, Security studies and Sociology. Therefore, an overview on the central approach the course is built upon is necessary. Secondly, the course provides an insight into implication of societal security in the field of engineering and design. Here, we connect the concept with the field of engineering and design in a holistic narrative on societal security. Thirdly, the course aims at teaching students to identify and analyse situations related to societal security in engineering and design. Fourthly, the course provides students with a selection of practical tools and suggestions for developing new societal security technologies.

3.3. Course structure

When starting a course, the students are directed to the homepage of the course, which displays the course structure and gives an overview of how to operate the platform (Figure 1). Specifically, it contains information on the authors of the course material; it lists all the modules and briefly describes them; it explains the objectives of the course and gives an idea of the learning outcomes. By clicking on each module, the user can familiarise themselves with the content and train their navigation prior to starting the course.
Societal Security for Engineers and Designers

Welcome to the course

Societal Security for engineers and designers

About the Course:

- This course is one of the results of the SOURCE Project on Societal Security. The content for the course was jointly elaborated by European project partners that are experts in Security, Technology and Education: VUB, VSET, FSO, EOG, THD, and Tectalia.

Course objectives:

1. Introduce students to the basic ideas on societal security
2. Provide an insight into the idea of societal security in the fields of engineering and design
3. Teach students to define and analyze situations related to societal security in engineering and design
4. Provide practical tools and suggestions for developing new societal security technologies

Who can participate in the course?

The course is designed for a Bachelor and Master level self-paced learners. Additionally, the source can be used as inspiration for educators in Engineering, Technology and Design. All interested individuals are welcome to participate in the course with given opportunities to choose from particular modules and tasks without taking the whole course.

Course description:

There are 5 study modules and an additional video module. Each study module covers a particular topic. It contains: 1) reading material, 2) two assignments, 3) an quiz and 3) an open-end question for discussion. The reading material provides comprehensive overview of a particular subject, prepared by our societal security experts. The corresponding tasks will train practical usage of societal security approach in a certain context. The multiple-choice quiz is meant for self-evaluation of learning outcomes. The open-end questions aim at encouraging interactive discussion among all course users, where they can reflect more on the topic of the module. The additional video module allows students to watch a number of videos on Societal Security where both security practitioners and scholars will share their views on changes in security sector in today's Europe.

Course Modules:

- MODULE 1: Introduction: Principles of Societal Security In Theory and Practice
  - This module briefly covers the history of the concept of 'societal security' in International Relations and Security and outlines its usage in the areas of Technological Design and Engineering in the EU.

- MODULE 2: Security Innovation
  - The present module describes the process of creating innovations in Societal Security. It explains why innovation in societal security is important and what stages innovation process undergoes in development of a quality product.

- MODULE 3: Societal Impact in the Use of Surveillance Technologies: Privacy VS Security
  - This particular module will introduce you with the most recent tendencies in the field of surveillance technology. In a nutshell it will concentrate on the concept "privacy by design".

- MODULE 4: Societal Impact Assessment
  - The following module provides tools for successful assessment of innovations in societal security. In particular, it offers unique strategies and recommendations for the successful development of novel technological solutions both at the stages of their design and implementation.
The course consists of six educational modules (Table 1). Each module nominally addresses a specific stage of the process of security development and design (Figure 2). The added value of this approach is that it helps students gaining specific knowledge on a societal security innovation development process within the whole context of engineering and design. Such important stages within the process, as citizen’s participation, weighing privacy and design, as well as innovative methodologies are also covered by the modules beyond any traditional explication of the design phases.

**Table 1. Description of modules**

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>Introduction</em></td>
<td>The module provides a theoretical overview of the concept of societal security from the point of view of constructivist studies on international relations and demonstrates the way this approach to security is implemented in Research and Technology Development (RTD) area.</td>
</tr>
<tr>
<td>2. <em>Security Innovation</em></td>
<td>The module explains the spectrum of problems to be taken into account at different stages of developing innovative solutions in the field of security. Precisely, the text covers the necessity of innovations, process and cycles behind innovation development, innovation systems, uncertainties in the development process.</td>
</tr>
<tr>
<td>3. <em>Societal Impact in the Use of Surveillance Technologies: Privacy VS Security</em></td>
<td>The module covers societal impact in the use of surveillance technologies related to privacy and security and attempts to demonstrate a win-win approach between the two. All in all, the deliverable discusses the major concepts of: privacy, surveillance and privacy by design and their practical applicability in technical objects like drones and processes related with their design and usage.</td>
</tr>
<tr>
<td>4. <em>Societal Impact Assessment</em></td>
<td>The chosen approach contributes to an understanding of the impacts of a given technology on society and suggests a tool for assessing the problems and vulnerabilities to be taken into account at the stage of designing a technological solution.</td>
</tr>
</tbody>
</table>
5. *Citizen Participation in Societal Security*

The module offers an overview of citizen participation through the process of development of new technologies through the so-called: “active citizenship” at the communal level. The main concepts and psychology of active citizenship participation were considered alongside the design of technology for active citizenship through, for example, apps and social networks.

6. *Societal Security and Living Labs*

The module is as a *Bonus module* listing and describing selected online sources on Living Lab technologies and their methodology useful for creating the community of practise for technological innovation. The final module on Living Labs was labelled as a bonus module to offer flexibility and additional resources for the targeted audience. The module also includes an additional video package encompassing video lectures developed in collaboration with PRIO for WP7.1 (PhD course on technology and society).

*Figure 2. Stages of the societal security innovation development and design*

Each module consists of two major parts: *reading material* and *educational assignments* (Figure 3). The *reading material* includes: 1) the text written by the partners who followed academic standards and 2) a glossary specifying key terms related to a specific area. *Educational assignments* include: 1) a multiple-choice quiz, an efficient form for self-assessment 2) competence-based tasks, often a creative scenario necessitating utilisation of the knowledge received through reading, and 3) a forum for interactive group discussion under a chosen module triggered by a topic-related question.
After reading the suggested materials, students are expected to complete three assignments. The first assignment suggests the list of questions to give students an overview of the most important ideas in the text (for example, see Figure 4). By pressing the “Submit Assignment” button the students then have an option to upload a file in an instructed format or enter their text in the box.
The second assignment in the module is targeted at increasing creative thinking and the ability to apply the received knowledge. The tasks vary to a great extent to provide more dynamics within the course and allow students to solve problems based on the materials they have studied (see Figures 5 and 6).
The third assignment is a multiple-choice quiz that was developed by task partners based on the reading material (Figure 7). The students are given 5-8 questions and several answers to choose from. Each question gives a point for the correct answer. At the end of the quiz, the points are summed up and a student can see the correct answers.
At the very end of the module, students can take part in a group discussion by posting their comments, liking the comments of other users and responding to them (see Figure 8). A question for discussion is offered as a teaser and starting point for the discussion.

Figure 7. Example of a quiz

Figure 8. Example of discussion forum
The structure of the curriculum is designed to be appropriate for self-paced learning. It implies a great extent of flexibility for students to switch between modules and skip the ones they find less relevant to their pursuit. In addition, the curriculum is designed to allow pedagogical coordination of the course based purely on online learning, or blended learning, or in-classroom learning. It should be taken into account that any type of course coordination would require additional resources such as human resources, time and finances.

3.4. Evaluation

The course is programmed in such a way that it allows each student to collect points for all the assignments they perform. At the end of the course, all points are summarized into a final result. The point system serves as a motivational factor for students to complete the tasks and monitor their progress.

4. Dissemination of the course

In a pro-active manner, the VUB and the SOURCE consortium have been disseminating the course through different means (newsletters, social media) to make the content visible for the target audience. In addition to that, the link to the course with a self-enrolment option was advertised through the SOURCE project website. Secondly, the course was widely distributed through the professional networks that project partners have access to. Thirdly, with a new Instructional Designer in the VUB team, possibilities for wider dissemination based on Canvas tools have been discussed. The course can potentially become part of a wider international Canvas community; however, this requires additional resources (time and finances). Therefore, the further strategy in dissemination and wider outreach of the course content are going to be reflected in planning of the future SOURCE Virtual Centre of Excellence.
Annex 1. Source survey report

Source Survey Results
Prepared by: Ólaf Sóebech & Laraine d’Antin
9 November 2015
SOURCE WP7 TASK 2

EXECUTIVE SUMMARY

Objective
This questionnaire was sent out to the various engineering departments and institutions for two key reasons. Firstly, we wanted to ask the experts in the field what type of knowledge is missing regarding society and security in engineering studies, and where there might be interesting gaps to fill. Secondly, to explore willingness to further collaborate on the training course by providing further insight in developing the course and potentially testing the course material once the content has been fully developed and made available via a freely accessible online virtual learning platform.

Questionnaire Participants
We contacted the Engineering departments at the Vrije Universiteit Brussel, the University of Newcastle, the University of Loughborough, the University of Bristol and the University of Sheffield.

From these contacts we had a very small response rate, nine Professors and four PhD Students responded, giving us a total of thirteen participants to date.

These participants came from a variety of engineering Departments/Faculties;

Architectural Engineering
Mechanical and Systems Engineering (x 4)
The Department of Electronics and Informatics
Applied Physics
Reconfigurable Architectures, Parallel Processing & Telecommunications Oriented Research
Department of Hydrology and Hydraulic Engineering
Civil and Building Engineering
The department of Electric Engineering and Energy Technology (x 3)

The participants explained their area of study/expertise as:

It is clear that this relatively small number of respondents is a very diverse group, touching very different fields of engineering and design. On one hand this can be seen as a strength, as these people can give us a very broad insight of the whole field, especially the ones that are willing to further collaborate on developing and potentially using the training programme. These responses also show us that we are dealing with an incredibly large sector, and we need to decide if we make our training material general enough to be interesting to all groups, or narrow down to a specific group of engineers, and cater to them more specifically.
SOURCE WP7 TASK 2

Questionnaire responses

In the following section, we look at the responses to each question individually. An online questionnaire was used: https://ses.formstack.com/forms/source

The questions asked were:

1. In your opinion, does your programme/department address issues of societal impact and societal security of engineering and design?
2. Tick all the subjects that you think might be interesting and useful to address in a course on society and security of engineering and design: (Ethical aspects of security design, Security psychology, Environmental impact assessment, Societal impact assessment, Societal and environmental life cycle analysis of security relevant products and services, Security innovation, Privacy and security, Community policing (tools, applications, design), Critical infrastructure of society and security, Politics of security design, User empowerment, Value balancing (liberty vs. security), none of the above- these are not important for design or engineering, Other)
3. If you were to add a course in society and security for a design or engineering curriculum, what would such a course include?
4. Where do you see future challenges (limitations) for your current field/study of engineering or design?
5. Where do you see the most interesting future developments in your field that relate to societal change and its security implications? (where are we heading)
6. Would you be interested in getting involved in a larger capacity in the development, testing or potentially using the online learning platform?

The aim was to keep the questionnaire as short as possible, while still addressing the key issues of societal security relation with engineering and design. We wanted to test if the topics we have already preliminarily chosen are seen as important by the experts in the field and to see how we can maximise the usefulness of our course while remaining within our capacity and knowledge core.
QUESTION 1:

In your opinion, does your programme/department address issues of societal impact and societal security of engineering and design?

6 of the participants believe that their programme/department do address issues of societal impact and Societal Security of Engineering and Design. 3 feel that they partly address these issues and 4 feel that they do not address these issues at all. Interestingly most of those who said yes to their programme addressing societal and security related issues, answered the second question of what they would find an interesting addition to be a) societal and environmental impact assessments, B) societal and environmental life cycle analysis and c) ethical aspects of security design.

QUESTION 2:

Tick all the subjects that you think might be interesting and useful to address in a course on society and security of engineering and design

Looking at the chart (below), we can see that Environmental Impact Assessment is viewed most often as a needed subject, with 10 out of 13 participants ticking the field. This was followed by Ethical Aspects of Security Design (8), Privacy & Security (7) and Societal Impact Assessment (7). Societal and environmental life cycle analysis of security relevant products and services, Security innovation. Critical infrastructure, society and security, and User empowerment were also considered important by 6 respondents. Other topics received lower scores (Politics of security design, Community policing (tools, applications, design), Security psychology, and Value balancing (liberty vs. security)).
Further visualisation on the responses:

These topics were chosen as specific options for responders based on the topics suggested by the consortium experts and suggestions made by the preparatory Skype meetings. We can see that out of our 12 suggestions, 8 of them were considered important by around half of the respondents. This indicates that the topics we have pre-selected are in line with the needs identified by the experts.

In order to further benefit from the knowledge of the respondents, we followed the above question with a series of free text questions, enquiring further how they would construct a course, what subjects they would find most important in addition to those on the list, and to look at where they see existing gaps and challenges. The following section highlights the main responses received.
QUESTION 3:

If you were to add a course in society and security for a design or engineering curriculum, what would such a course include?

Here the answers were quite diverse, since the respondents come from very different engineering backgrounds. There was very little overlap in responses, so identifying the most relevant or important responses will depend on the project partner's strength and ability to adapt the recommendations to the existing topics in the course. Following is a selection of responses:

- General Awareness
- Education and awareness creation for professors and trainers on security issues.
- Impact of standardisation
- Building design and climatology
- Rationale, methods, examples
- Practical use of security: Adblockers, PGP, myWOT, VPN, Tor etc.
- Current society and security problems faced by modern society
- Identification of societal and security issues in the area of course specialisation
- Formalisation of security concepts
- Guidelines for security design and evaluation of societal security of a system
- Society and security of buildings
- Energy challenges; life cycle; dismantling policy; recycling; rational use of energy; mobility; people management;

QUESTION 4:

Where do you see future challenges (limitations) for your current field/study of engineering or design?

Again, there are varied responses. Although many of the responses relate to material, resources and energy some also address important challenges of societal security related aspects and are relevant to the course we could be creating. Here is a selection of the most relevant responses:

- Lack of awareness of the impact of wrongly designed devices when it comes to security and privacy.
- Forecasting the effects of using present design methodologies and technologies to society and societal security
- Personal privacy vs. society’s overriding need for secure facilities
- Trust networks and fair sharing of IP so that good ideas and products reach people without artificial political/security limitations.
- Resource efficiency, long term value engineering, environmental life cycle impact and costing, building information management
- Robust design i.e. design under uncertainty (of the geometry because of wear or manufacturing tolerances and of the operational conditions)
- Limitations of resources especially CFD
- The limitation of technology to realise the product or the design.
- Migration to smart and green technologies and solutions
- Sustainable mobility; sustainable energy production; rational use of energy; rational use of natural resources; electric energy
- I don’t see any, the only limit is imagination.

QUESTION 5:

Where do you see the most interesting future developments in your field that relate to societal change and its security implications? (where are we heading)

Interestingly many of the responses have to do with innovation, environmental and sustainability issues and mobility. Where our course could fit in, may be more in addressing the general developments (e.g. a more technological driven society and security and privacy as non-functional properties in IT systems design).

- Standardisation security design related to military applications
- Towards total disaster if it comes to IoT if not quickly there is a mentality change.
- The research to include security and privacy as non-functional properties in a IT system design is important.
- Tangible products and services which improve quality of life and create jobs
- Cryptocurrencies
- Increasing intelligence in products - miniaturisation which can have impact in privacy and environmental security
- Societal and environmental analysis of security relevant products and services
- A more technologically driven society
- Sharing of data and applications which impact on or require the internet such as in the Internet of Things
- Mobility: change from individual motorised car transport to other multimodal transport.
- Sustainable and environmentally clean vehicles
- Autonomous driving and safety and security issues
- Sustainable energy and waste to energy nuclear energy
- Development of different platforms for displaying simulations of air flow in buildings
- Use of virtual reality in assessing building designs and displaying data
QUESTION 6:

Any other insight that would help us in developing a useful course that would broaden students’ perspectives while remaining relevant to their studies?

Our final open question was intended to see if our questionnaire was overlooking something important and we allowed space for respondents to air out their general thoughts. The responses interestingly provided some general advise on the method of teaching the planned course:
- Make a course for professors first.
- Awareness of multiple aspects of engineering impact on future development of society and its security.
- Teach how to work as a team collaboratively whilst protecting borders, both technical and physical.

QUESTION 7:

Would you be interested in getting involved to a larger capacity in the development, testing or potentially using the online learning platform? If yes, fill out your information below.

We have 8 participants confirm that they wish to keep in touch. We are eager to meet with the ones from VUB face to face if possible for an informal discussion. We are also hoping that these professors would be able to test our material.

CONCLUSION

Way Forward

The feedback received from the 13 respondents, even though a small sample, does give a lot of material to consider. For one, the target group is broad and we must decide whether to focus on one area of engineering and going into detailed substance, or to remain without focus on the general, provide general awareness, guiding material and introduction of societal security related issues to the broader audience.

Second, there is a lot of focus on the need for the environmental assessment, and environmental implications of engineering, from resource extraction, user phase, safety and end of use period. Additionally, technological innovation and privacy seem to be mentioned frequently as well. These are topics we might want to address specifically in our source.

Finally, this questionnaire is intended to give us a small insight into the field. It is by no means a complete analysis. It should be sufficient to get us to the next steps. The contacts we have made thus far, with the experts who kindly responded, we want to keep and develop further, so as to ensure higher chances of success of our final product: the online training course for engineers and designers on societal security.
Annex 2. Kick-off workshop minutes

**SOURCE D7.2 Workshop minutes**

Brussels, 26 November 2015

Attending: Javier Herrera & Jorge Garcia Valbuena Lotero (TEC), Reinhard Kreissl (VIC), E. Anders Eriksson (FOI), Mirjam Huis in 't Veld (TNO), Katsiaryna Kliuyeva & Klaudia Tani (EOS), Laraine D’Antin, Christof Roos & Ólöf Söebech (IES).

**Mission Statement:**

After introduction of the day and the aims of the workshop, a common brainstorming of what the aim of the course should be.

What are we trying to teach? What do we want to stand out in the memory of students after completing the course?

**A list of responses:**

- To have opened up their mind towards the impact of their work
- To move away from technological centred vision to human centred vision
- The challenge is to put this abstract idea of societal security into terms that make sense. To make societal security something that one can perform in practice. To break down the concept into bite size useful activities
- Engineers are expected to follow rules - we are asking them to break the rules. We need to have a supporting structure to help them break out of their BAU thinking, - to provide them with a structure of the things we want to contribute
- The students should be able to influence others (their colleagues), for that they need a methodology
- To formalise the concept in a way so that the students know where to put it when they are designing and creating.
- In order to challenge their background assumptions a lot of dialogue will be needed - is there a way to add dialogue into the course?
- To sensitishe the course students to understand that anything they do has an impact on society
- Going beyond SDS perspective on engineering
- To bridge gaps between developing products and services to look at the broader picture, to link with impact it has on humans, society and the security industry.
- To gain skills in critical thinking
- To remove barriers
- To learn to implement responsible research and innovation (the 6 aspects of EC, and societal security)
  - Perhaps we can look at tools developed for RRI?
- This course can be a convergent of privacy and security related issues
- To help engineers to go beyond customer specifications and to look at broader impacts (env. And societal LCA and impact assessment)
- Mainstreaming concept of environment, norms, values, the social world into engineering and design
To help them realise that for every step they take - there are effects, and to analyse what are the effects and who is affected. To provide guidelines.

- We want to focus on not only ethical aspects or environmental, but also look at who are the actors and to encourage engineers to involve them once they have been identified. To teach them how to involve target groups in their process.
- To understand user centred system design

There are different types of engineering - a certain type very societal oriented, in environmental field- for instance. Do we want to target one group more than another? Can we be useful for all groups of engineers? And Designers?

If the environmental field of engineering has good practices of adding environmental awareness and factors into conventional engineering studies, perhaps we can learn from them and adapt to a broader societal consideration?

If we have to start from scratch – we have to first explain the concepts, then try to see how the process of designing works and where to add the societal security aspects – bringing in examples of processes, (e.g. if you follow this method- which steps phases or moments do you need to take into account). We might not be able to be fully specific about all-, but we can give ideas, open the discussion.

We need to explain why this is important to engineers- why they should look at societal impacts.

User groups/target groups

To learn from others!

Concrete: German theologian is working on privacy- physical privacy- work with transgender

Super impressive- she has identified a very relevant test group-

This teaches engineers where is the blind spot - to look at who is the most vulnerable group, and to involve them.

Another key target group are the people operating security related products, the routine users. For instance, to see how a gadget affects competences.

SOURCE should be a space where all these studies, information, key people and learning possibilities are concentrated. SOURCE should provide recourses to people.

Tasks IES:

Based on these, the IES will develop a coherent mission statement text that will be used for front page, for introduction, for general dissemination etc. These thoughts are relevant to all our next steps

Tasks Others:

Think about these when developing the rest of your work, send us your thoughts if you come up with new ideas
SESSION OVERVIEW

Session 1 Principles of societal security - IES

Planned format for this session is:

1. Introduction questions relating to the mission statement ideas above, setting the tone, challenging the students, hooking them in. Questions to tweak their interest.
2. Intro text, a text of 5-10 pages on the history of the concept, its meaning, it’s use, it’s relevance.
3. Video interview of a practitioner, general introduction of how an it developer and researcher sees the relevance of society as whole in developing products. A person that is relatable and clear... general introduction to thinking outside of the box and looking at the human side.
4. Reflections: questions encouraging students to think about what they read and saw, and how to apply this to their work, their field of interest. Reflections will also give introduction to the following sections
   a. There will be extra hints to help them get going (or to be help the trainer to further explain the reflections)
   b. The reflections can be used as assignments if the course is given by a tutor, or students can write their responses and share their answers and thoughts on a student board... an open space shared by those taking the course?

Discussion:

- To take into account the evolving concept of security – we need to make sure we look at more than the SOURCE consortium as resources, and to look at the different concepts - others are doing what could be considered societal security (e.g. German theologian)
- It would be useful to collect a list- from all partners of the people who could provide interesting theoretical input for the introduction text. It could enrich our course - it’s an evolving network, and our theories could be updated over time
- Also we should be aware of differences between countries (who are e.g. differently sensitive to privacy, have different level of acceptance, different societal expectations between countries)
- We might want to use actual cases already in the beginning to attract people - these texts need to reach people and hook them in
- The theoretical part remains very important and needed. The course will be in some parts practical
- In general for WP7 and SOURCE project, the network of excellence should reach out and connect to - all relevant research centres in the field. There are other actors than the ones currently involved
- We should always think of the longevity and potential evolution of the course

Tasks IES

IES – to finalise all the material- fill in the content we have so far and take into account the suggestions, think of a concrete example (is Sebastian’s interview enough of a concrete example)

Tasks others

Send a list of people- theoretical frameworks, individuals, opinions to help us enrich the text
Session 2 Security innovation - FOI

Planned format for this session is:

1. Mainly text based content?
2. Possible video interview?
3. Possible case study?

Target group early practitioners rather than students.

The content will highlight challenges to security innovation. Why security innovation is difficult. List of reasons e.g. public good (tight budgets), private sector actors do security to comply with regulation (comply at lowest cost – disincentive for innovation).

The session will explain political reasons, complexities of security, as well as uncertainties of impact, and concepts of rural and urban knowledge networks (densely and scarcely populated disciplines) – intellectual geography. It will look at 4 archetypes of security innovation and give examples to relate the theory to practice. Key dimensions for different innovation models: 1) balance between social and technological aspects & 2) rate of change: fast/ slow.

The session will use case studies to bring the content to life, and add focus to some of the potential solutions/resources/opportunities towards an improved security innovation environment

Anders has an idea already for person and content for interview

Discussion

- It would be indeed useful to have examples
- How do we transform this content presented today to the online content and keep it interesting?
- We might want to further define the aim of this session and learning outcomes
- Could we have a problem that the students need to solve as a part of the lesson?
- If you want to do research to support industry innovation, you need more assessment related to the field?
- Security field is not dense
- Pose a concrete assignment, mix of security and social aspect
- Might be interesting to discuss/do a case on social innovation – E.g. ways of collaborating with refugee volunteers, coming in on social media... with so many wanting to help coming ad hoc when it suits them, there is a need for person management. This could be the problem to solve?
- The rural/urban innovation geographies/sectors/disciplines /connected areas could be possibly made super interesting through graphics and images - visualising it.
  - It might be interesting to tell the Nokia story –
- Security is about handling low probability events, including them into the design, some products just have an occasional function
-
Session 3: Societal Impact Assessment - Vicesse

Planned format for this session is:

- Text providing introduction to the concept of SIA, its uses and its relevance. What is societal security, what do you have to look for, does it benefit society, what are the needs of society? What is a societal impact, what is the security need?
- Text providing info on how to do steps, how to apply an impact assessment
- A case or 2 cases where SIA is implemented step by step
- Reflections/an extra case for students to tackle – with help of tutor or in group- with supporting material

Aim: Mainstreaming societal security in security research/development of services and products

An important part of the session to know is that this is not about predicting impact, it is more abut transporting the idea that this is a process, references to the reading list, key message: from the very beginning try to provide mechanisms or routines

Impact should be looked at from the beginning and at every step of the way.

For this session we will be developing a tool for impact assessment, based on an existing tool, adapted to the target group

Decisions and Options

- Scope: generic or project specific?

- Focus: Internal (how does the tool affect the work flow, organisation) or external (discrimination, cultural issues, fundamental rights)?

Discussion

- It is important to make this session accessible, to create interactive map or graphical/animated images
- consider the social impact of the system, distinguish between good and bad, societal effect
- re-adjust impact assessment and make it more specific for engineers, adapt it to the target group
- Is it possible to strip the information down (of the cases), use the same format for all the case studies
- This is not going to be a tick box exercise, but more inquiring, approach

Tasks FOI

To further develop the content, taking suggestions and format into account. Create all the content, reach out to the people that could help, and come up with a prototype of complete content before end Jan. To get in touch with IES as soon as you hit any walls, so we can discuss ways to climb those

Tasks all

To send material to Anders that we think could be of relevance and to help where we can
- ACTORS, these are important, to look at societal impact considering the different actors/stakeholders involved
- Does it matter which role you have when you do the SIA? As a user you might have different experiences than as an engineer or creator of technology?
  - Could we make 2 cases from different angles?
- We want to look at when systems interact with people?
- Do we take into account the right of all people (also marginal/vulnerable groups)?
- This assessment methodology grew out of the environmental process - freedom of locals to veto... so it does inherently look at broad level of stakeholders
- Do we have specific methodologies - actor maps - toolkits and the knowledge... how to involve them?
- Cases could be airport, walking through and identifying
- Or a new technology – e.g. a sensor

**Tasks Vicesse**

To further develop the content, taking suggestions and format into account. Create all the content, reach out to the people that could help, and come up with a prototype of complete content before end Jan. To get in touch with IES as soon as you hit any walls so we can discuss ways to climb those

**Tasks all**

To send material to Reinhard that we think could be of relevance and to help where we can

**Session 4 Living labs / Forecasting/methodologies - Tecnalia**

**Planned format for this session is:**

- to create a practical methodology for students to adopt and use when developing new products/services
- explanation text
- the methodology explained step by step
- cases

Aim: to provide a tool that the students can use to implement societal considerations when developing technologies.

There were two different methods proposed: Living Lab, on one hand, and a more technical forecasting tool that both could be adapted for engineers and societal security in particular.

Living lab methodology focuses on innovative user centred experiences. Innovative user-centred experiences: UCD and UDOI (user driven open innovation), democratize innovation. Living lab methodology is used more for social innovation. It is a multi-stakeholder approach (think aloud technique). The tools and forms used in living labs could be re-worked and adjusted to fit for this session.

The other method proposed is based on an existing tool that does Forecasting for crisis or risk situations using insight from human experts to build future scenarios. The goal of this tool is to anticipate potential critical scenarios...
before materialization and to foster careful analysis and mitigation strategies. Currently the tool has no societal aspects taken into account. This could be added and the tool remade to fit our topic.

Discussion

- **Living labs**
  - It may be tricky to teach living lab methodology through a non-moderated online course, but perhaps the toolkits can be use? E.g. actor mapping, personas and scenarios, ethnographic observations, human centred design etc.?
  - The Hague Security Delta operates a living lab, researchers test and refine their methods – perhaps we can get a case from them, or collaborate somehow?
  - So the idea would be to give students templates, toolkits, and methodologies to include and identify all the relevant stakeholders? This session may still need a clearer aim?
  - There were mentioned several and various tools - you might want to narrow them and select, for putting in a course - rather than talking about many techniques? Get specific
  - This session will benefit from being very much built around case(s)
  - How are these LL projects initiated? The government promotes the initiatives ... paid by governments. Profitability (need to engage local authorities in), is something we might want to add then to the session... “who to involve, or how to get support for your project”?
  - Main challenge for LL is how to give the LL experience through online platform

- **Forecasting**
  - the fact that this is a technical tool could make it very relatable and interesting to engineers
  - Where do we introduce the aspects of societal security? Where do we add it to the model?
  - What is the difference between scenario/event/
  - What would the final product look like? The one where societal aspect is included? How could we put this on the online course? Is it feasible?

Tasks Tecnalia

To select a methodology to use - or to create a new one that combines these aspects. To further develop the content, and the way it will be presented in the VLE taking suggestions and format into account. Create all the content, reach out to the people that could help, and come up with a prototype of complete content before end Jan. To get in touch with IES as soon as you hit any walls so we can discuss ways to climb those

Tasks all

To send material to Javier that we think could be of relevance and to help where we can. IF we decide to go forward with Living lab methodologies, Javier and Mirjam and Olof should get together to get in touch with HSD to look at possible collaboration (Ida Haisma)!

Session 5 Ethical implication in the use of surveillance technologies for society - EOS
Planned format for this session is:

- introduction text to a problematic area: Ethical implications in the use of surveillance technologies for society
- Text highlighting privacy related issues, conflicts and the concept of privacy by design
- Introduction to relevant policy documents
- Practical examples and cases- analysing the various instruments, identifying problems, good and bad things, potential solutions
- Assignment- student analysing one instrument? Based on all the things he or she has learned during the whole course so far

Aim: Awareness raising on privacy related issues – getting some “hands on” way to explore issues relevant to societal security and engineering

This session could be after a theoretical discussion as it will be structured in a more exercise, practical, concrete way. It will focus on how to ensure that privacy-related issues are taken into account while developing security technologies. More specifically, it will address multiple aspects/risks of the use of security surveillance technologies – biometrics and UAVs - in relation to societal security.

The list of cases and issues has been developed and focuses on biometrics in migration and border management AND use of drones in crisis management.

Discussion

- it is a good idea to get practical and focus on cases and do exercises
- cases now are hot technologies, we might want to consider longevity? This will still be hot in a couple of years?
- What do you mean by good and bad sides? How is that defined? How is a technology win - win? Is there no loser?
- How could this be implemented in the VLE?

Tasks EOS

Decide on case studies, decide on methodology for analysis, and definitions of good and bad. To further develop the content, taking suggestions and format into account. Create all the content, reach out to the people that could help, and come up with a prototype of complete content before end Jan. To get in touch with IES as soon as you hit any walls so we can discuss ways to climb those

Tasks all

To send material to Katsiaryna that we think could be of relevance and to help where we can

Session 6 Citizen Participation  - TNO
Planned format for this session is:

- Text introduction to the behavioural and psychological aspects of developing security related products on society
- Introduction to general trends in citizen engagements
- Give a student a task to create a product of a service for his or her local neighbourhood
- Follow that process step by step (stake holders, impact, how to motivate, aim etc.)
- Give examples of the many initiatives that are ongoing and show how each of them is impacting local neighbourhoods.

Aim: to get the students active learning by doing at a local scale, being able to potentially see impact of their ideas, to spark their creativity, to introduce the behavioural and psychological aspects to technology development.

There are several models that exist already, and there is enough experience in house at TNO to develop the full session. The session will analyse trends in citizen engagement, the relationship between government and citizens, and question students about things that are already going on in their own neighbourhoods. The student will do his/her own problem solving to an existing societal security related problem at a local scale in their own environment. It will look at behaviour aspects such as the impact of success stories as encouragement for others to do things. (feeling that success is possible)

We might want to link further with other projects

Other projects/ tools mentioned that the course might benefit from: OSIST model, Relief model, project Cobacore (offer and needs), living lab- Engel

Discussion

- Good idea - how do we implement the student assignment if there is no moderator?
- This is mainly focused on developing apps? As an engineer?
- Is there a way to allow the tools from other sessions and this tool to relate?
  - Sensitizing, opening eyes and impact assessments – in general we should think about the order of the sessions and overlaps

Tasks TNO

To further develop the content, taking suggestions and format into account. Create all the content, reach out to the people that could help, and come up with a prototype of complete content before end Jan. To get in touch with IES as soon as you hit any walls so we can discuss ways to climb those

Tasks all

To send material to Mirjam that we think could be of relevance and to help where we can — also connect her with relevant networks
Planning Matrix Activity

Everyone filled out their planning matrix activity. This was done to get a clearer picture of each session, to help Laraine with context and overview and to try to make things concrete from a more pedagogical level.

<table>
<thead>
<tr>
<th>Tasks all</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you have not sent yours to Laraine- please do so. If you want to add or remove or edit yours, get in touch</td>
</tr>
</tbody>
</table>

Round up of the day

We agreed that good progress has been made, our plans are ambitious but doable, and that we still have work to do, each on our own.

We aimed to streamline and overlap sessions, but returned to original session outline for manageability

Final session

Guest speakers- we discussed how we could help design the PhD curse in Oslo, by suggesting names. This will in turn be useful for us, if we film the sessions there and use for this or the other deliverables within WP7.

Other partners, networks, knowledge holders

In general, for this deliverable and others, getting people with the knowledge on board as interviewees, getting universities or potential users on board and getting advisers are all key issues to increase the success of our end products. Let’s really think about people and their potential role in this deliverable (as well as in the whole Network of excellence to help it grow)

Timeline

A preliminary timeline for WP7 was presented without any resistance.
Tasks general

1. Think about our mission statement and learning outcomes
2. work on your session
3. let us know if you are stuck
4. Think about people for
   a. Interviews
   b. Cases
   c. Users
   d. Advisers
   e. Partners
   f. Critics
   And send us a list of get in touch with yourself. We all own these deliverables together
5. Start a small space in the brain for idea growing for future WP7 deliverables
6. Please get in touch, with ideas, questions, if you want to make changes... you are free to adapt your session in a way that you think is useful and realistically doable!

Next meeting: Skype/telephone in 2nd week of January. A doodle will be sent by 5 Dec.

Annex 3. Matrix activity

<table>
<thead>
<tr>
<th>Modules</th>
<th>Objectives</th>
<th>Ungraded</th>
<th>Graded</th>
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<tbody>
<tr>
<td>In the cells below, include:</td>
<td>In the cells below, add objectives that state:</td>
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<tr>
<td>• A title for each module.</td>
<td>• What the student should be able to do stated in terms of activities that can be observed.</td>
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<tr>
<td>• A summary of the topics, concepts, and procedures you will cover in the module (optional).</td>
<td>• How you will assess each objective in parentheses after the objective. For example:</td>
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<tr>
<td></td>
<td>Upon completion of this module, you will be able to:</td>
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<tr>
<td></td>
<td>✓ Analyse family systems metatheories and define a personal theory of family practice. (SELF-AWARENESS PAPER)</td>
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<td></td>
<td>✓ Identify family systems theories as being constructionist or family systems oriented. (MODULE QUIZ)</td>
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<td></td>
<td>In the cells below, indicate:</td>
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<tr>
<td></td>
<td>• How students will learn the information (e.g., readings, lesson notes, mini lectures, videos). Provide specific details: URL, textbook page numbers, etc.)</td>
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<td></td>
<td>• What guidance/support you will provide (e.g., study guides, partially worked problems, example papers, answers with feedback).</td>
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<td></td>
<td>• How students will practice what they learn (e.g., non-graded quizzes, discussions, worksheets).</td>
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<td>• Describe how mastery of the objectives will be assessed (e.g., quiz on fractions, small group discussion on the pros and cons of capital punishment, research paper, etc.).</td>
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<table>
<thead>
<tr>
<th>Session 1: Principles of Societal Security in Theory and Practice</th>
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<td>1. Introductory questions and Visualization (Comic/Graphic/Caricature)</td>
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<tr>
<td>2. Societal security: A concept in its historical context</td>
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<tr>
<td>3. Societal security in academic and practitioners’ debate</td>
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<tr>
<td>4. Sebastian Denef, Video presentation</td>
</tr>
<tr>
<td>5. Reflections</td>
</tr>
</tbody>
</table>

| **√  Describe the contributions of pioneers to family therapy.** *(DISCUSSION FORUM, MODULE QUIZ)* |
| | 1. Understand the concept of the Principles of Societal Security. |
| | 2. Explore how the Principles of Societal Security are applied to their field of study. |
| | Reading the lesson notes. |
| | Watching video |

**Session 1: Principles of Societal Security in Theory and Practice**

1. Introductory questions and Visualization (Comic/Graphic/Caricature)

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3. Societal security in academic and practitioners’ debate

4. Sebastian Denef, Video presentation

5. Reflections

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