



SMART MATURE RESILIENCE

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EXECUTIVE SUMMARY

On the 4th of April 2017 the *European Workshop on Resilience in Cities and Communities* took place at DIN in Berlin. The workshop lasted a day and 44 people from 11 different countries attended the event. The participants were researchers, city representatives, consultants and standardization experts.

During the first half of the day, the project representatives of three DRS-7 (SMR, DARWIN, IMPROVER), two DRS-9 (RESIN, RESCCUE) and two DRS-14 (RESOLUTE, RESILENS) projects introduced their research results. The presenters gave the participants an overview of key figures, objectives and solutions/tools developed within the respective projects. When applicable, they also described the already identified standardization potential.

Next, two standardization experts gave an introduction to the work of the ISO/TC 292 and ISO/TC 268. In order to do so, the first professional explained the international standardization system.

The third part of the European Workshop consisted of an interactive session, where the participants were split up into groups. Group A was made up of the developers of solutions/tools and Group B was made up of the users of solutions/tools. The latter one focused on the challenges and needs concerning resilience and standardization, while the other group created an overview of the developed solutions/tools. Afterwards the groups were again put together and each group presented outcomes and discussed conclusions.

The fruitful discussions of the day were successfully finalized by a panel discussion, which was moderated by DIN and supported by ICLEI. An SMR representative, a standardization expert, as well as, a city representative were the panellists. The audience and panellists discussed the importance of standardization and standardization potentials.

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1. INTRODUCTION

1.1. RELATION WP6 AND SMR

In work package 6 (WP6), two reports on existing standards and standardization potentials were so far conducted (see D6.1 and D6.2). The latest deliverable 6.2 described the identified standardization potential and announced standardization activities toward the 'Engagement and Communication Tool', the 'Resilience Maturity Model' (MM) and the 'European Resilience Management Guideline' (ERMG). Since other projects also focus on the topic of resilience (DRS-7: SMR, DARWIN, IMPROVER/ DRS-9: RESIN, RESCCUE/ DRS-14: RESILENS, RESOLUTE), cooperation in the development of standards would be of public good. Therefore the identification of potentially interested parties for upcoming SMR standardization activities, such as city representatives and researchers, was one of the main goals of the European Workshop. Another aim was to discuss standardization topics with other projects and to find out the similarities and differences between the projects. Against this background the European Workshop was organized and carried out by DIN in Berlin. The present deliverable is a summary of the activities, which have been carried out during the workshop. The Table 1-1 gives an overview of the current and future deliverables under the task 'Initiation of Standardization Activities'.

Table 1-1: Overview of work packages

Task	Deliverable	Month	Comment
6.2 Identification of Standardization Potentials	6.2 Summary of Standardization Potentials	26	July 2017
6.3 Initiation of Standardization Activities	6.3 European Workshop Report	27	August 2017
6.3 Initiation of Standardization Activities	6.4 Proposal for (a) CWA(s)	30	November 2017
6.3 Initiation of Standardization Activities	6.5 Draft of the aspired CWA(s)	34	March 2018

1.2. PREPARATION

In order to guarantee a successful workshop, an organization committee at DIN was compiled. This committee was formed out of senior project managers, junior project managers and supporting staff. The planning started three month before the workshop. A draft agenda was conducted, the rooms and catering were booked and the speakers were invited. To disseminate the *European Workshop on Resilience in Cities and Communities* the agenda and detailed information was uploaded to the DIN website and the SMR website. The SMR project partner, ICLEI European Secretariat, invited cities through their well-built network of local governments, cities and communities around Europe. Furthermore, an announcement in the 'DIN Mitteilungen' and in the 'VDI - Informationsbrief zur zivilen Sicherheitsforschung' was published. Since DIN is known for its networking skills, an internal advertisement was also done. Thereby colleagues supported the contacting of potentially interested participants. The acquisition of speakers of the Technical Committees (ISO/TC 391, ISO/TC 268) was supported by this link.

2. AGENDA AND PARTICIPANTS

In the following subchapter an overview of the agenda and the organizations that attended the European Workshop will be given. Due to data protective reasons the names and detailed information of the participants will not be published in the present document.

2.1. AGENDA

The European Workshop started with a warmly welcome of the participants through the moderator of the day (René Lindner, DIN). He led through the day and directly announced the leader of the 'Business Development' group at DIN (Joachim Lonien) to introduce to the participants the topic of standardization. Mr. Lonien explained the standardization network, the different types of documents and through an example the 'DIN SPEC' product (DIN SPEC 91347 – Integrated multi-functional Humble Lamppost (imHLa)). The Table 2-1 give an overview of the day; the content will be explained in detail through the present deliverable.

Table 2-1: Agenda of the European Workshop

Day & Time	Activity / Description
09:30 – 10:00	Registration
10:00 – 10:05	Welcome and introduction to the Workshop - René Lindner, DIN e. V.
10:05 – 10:15	Introduction to DIN - Joachim Lonien, DIN e. V.
10:15 – 12:15	Presentations Information about resilience management – Activities in research projects • SMR - Dr. Jose Maria Sarriegi, TECNUN (Spain) • DARWIN - Dr. Ivonne Herrera, SINTEF (Norway) • IMPROVER - Dr. David Lange, SP (Sweden) • RESILENS - Sandra Hasenstein, Fraunhofer EMI (Germany) • RESOLUTE - Jan-Paul Leuteritz, Fraunhofer IAO (Germany) • RESCCUE - Ignasi Fontanals, OptiCits (Spain) • RESIN - Nicolet Baas, NEN (The Netherlands)
12:15 – 12:45	Presentations Information about city resilience – Activities in standardization • Security and Resilience Prof. Dr. Rainer Koch, University of Paderborn • Sustainable Cities and Communities Vasileios Latinos, ICLEI Local Governments for Sustainability
12:45 – 13:30	Lunch
13:30 – 15:30	Interactive session Sharing experiences: Challenges and needs of cities and communities for becoming more resilient vs. possible solutions and good practices

 15:30 – 16:00 Coffee break

 16:00 – 16:45 Panel discussion
 Gap analysis and future to do's in standardization

- Julie Robertson, Municipality of Glasgow
- Prof. Dr. Rainer Koch, University of Paderborn
- Dr. Jose Maria Sarriegi , TECNUN

 16:45 – 17:00 Wrap-up and next steps

2.2. PARTICIPANTS

The organizations that participated on the European Workshop are listed in Table 2-2.

Additionally the organizations were categorized as followed:

- Administration (city representatives),
- Academia (researchers),
- Consultancy,
- Standardization Institute and
- Other

Table 2-2: List of organizations that attended the European Workshop

No.	Type of Organization	Organization	Country
1	Academia	Fraunhofer EMI	Germany
2	Academia	Fraunhofer IAO	Germany
3	Academia	ICLEI	Germany
4	Academia	SP	Sweden
5	Academia	SINTEF	Norway

6	Academia	TECNUN	Spain
7	Academia	University of Agder	Norway
8	Academia	University of Linköping	Sweden
9	Academia	University of Paderborn	Germany
10	Academia	University of Strathclyde	United Kingdom
11	Administration	Government of Italy	Italy
12	Administration	Municipality of Bristol	United Kingdom
13	Administration	Municipality of Glasgow	United Kingdom
14	Administration	Municipality of Kristiansand	Norway
15	Administration	Municipality of Prague	Czech Republic
16	Administration	Municipality of Riga	Latvia
17	Administration	Municipality of Rome	Italy
18	Administration	Municipality of San Sebastian	Spain
19	Administration	Municipality of Vejle	Denmark
20	Administration	Municipality of Udine	Italy
21	Consultancy	Consultancy on Urban Development	Germany
22	Consultancy	CrossOver Consultancy	Germany
23	Consultancy	Ipocm-Consulting	Germany
24	Consultancy	OptiCits	Spain
25	Consultancy	Youthnest (Represented Thessaloniki)	Greece

26	Other	Berlin Fire and Rescue Station	Germany
27	Other	CODATA-Germany	Germany
28	Standardization Institute	NEN	The Netherland

3. PROJECT PRESENTATIONS

In the following chapter the seven projects, which were presented at the European Workshop are going to be shortly described. It has to be emphasized that three of the projects focus on cities: SMR, RESIN and RESCCUE. The content of the next subchapters was gathered through the presentations and notes of the session. More information on the projects can be found on their individual websites.

3.1. SMR

The SMR project is one of the DRS-7 projects, which started in June 2015 and the project coordinator is TECNUN. In total 13 project partners from eight different countries developed/ will develop five solutions and the overarching European Resilience Management Guideline (ERMG). The solutions are city oriented, since seven of the project partners are municipalities (San Sebastian, Riga, Vejle, Kristiansand, Bristol, Rome, Glasgow). The SMR project will develop the following five solutions:

- Resilience Maturity Model (MM): The solution is used to identify the ideal path for cities to increase their resilience maturity level. It basically guides cities through the path of becoming more resilient.
- Risk Systemicity Questionnaire (RSQ): Supports the assessment of potential risks.
- Resilience Building Policies Tool: Provides best practices.
- System Dynamics Model (SD Model): Shows how the process of developing resilience should be.
- Engagement and Communication Tool: An information portal which keeps stakeholders updated.

The MM, the RSQ and the Resilience Building Policies Tool are the three pillar solutions where the ERMG rests. These three pillar solutions integrate and connect through the SD Model. The Engagement and Communication Tool can host all other solutions developed in the SMR project. Some of the solutions are already completed and some are still under development. Currently preliminary versions

of the MM, the RSQ and the Engagement and Communication Tool are established. The Resilience Building Policies, the SD Model and the ERMG are still under development.

3.2. DARWIN

Many crisis affect critical infrastructures with cascading effects. There are certain responses for specific scenarios, but it is unclear what happens, when there is an unexpected crisis. DARWIN's objective is to improve the ability of stakeholders to anticipate, monitor, respond, adapt, learn and evolve, to operate efficiently in the face of crises. The DARWIN project is another DRS-7 project, which is developing a European Resilience Management Guideline. The project consortium consists of nine organizations from six different countries. The produced guideline will be applied to two critical infrastructures: Air Traffic Management (ATM) and Health Care (HC). The general idea is that this should be easily adaptable to other critical infrastructures.

DARWIN has done a general survey of concepts, practices and user's needs. Currently they are developing the guideline. Pilots of the tools are done in Sweden and Italy. The guideline consists of the following three core elements:

- Concept Cards (resilience management capabilities),
- a Roadmap and
- Darwin Wiki (Terminology).

The guideline will help to know the level of resilience of an organization. DARWIN is also working on a simulation tool and training guidance for the guideline. Furthermore the project representative mentioned that they are planning standardization activities in 2017.

3.3. IMPROVER

IMPROVER (Improved risk evaluation and implementation of resilience concepts to critical infrastructure) is another DRS-7 project with ten project partners. The overall objective of IMPROVER is to improve European critical infrastructure resilience to crises and disasters through the implementation of resilience concepts to real life examples of pan-European significance, including cross-border examples. The improvement will arise through the development of a methodology for implementing combi-

nations of societal, organizational and technological resilience concepts to critical infrastructures based on risk evaluation techniques and informed by a review of the positive impact of different resilience concepts on critical infrastructure. Thereby the general task is to improve risk evaluation and application of resilience concepts to critical infrastructures.

At first they have done a survey with responses from different parts of the world, from New Zealand to Africa about definitions and evaluation of resilience in critical infrastructures. Then they evaluated promising available approaches and further developed them to improve their effectiveness. At last they plan a demonstration of the methodologies, which are presented in the guideline. According to the IMPROVER project a successful implementation of the concept of resilience to critical infrastructures relies on its successful integration in existing security activities.

Regarding standardization the IMPROVER project considers a standard on general definitions as beneficial to the public.

3.4. RESILENS

The RESILENS (Realising European ReSilience for Critical InfraStructures) project consists of 12 project partners and is a DRS-14 project. The main objective is the operationalization of an effective crisis and disaster resilience management concept for critical infrastructures.

RESILENS is developing:

- a European Resilience Management Guideline,
- a Critical Infrastructure Resilience Management Matrix (Resilience Assessment Tool),
- an Audit Tool, as well as an
- E-learning Hub, which provides education and training materials.

All these solutions will be provided with the RES-DSP (Resilience Decision Support Platform). The guideline is a step by step guideline for organizations to enhance their resilience. It will have a general section with definitions, a methodology section and a functional section. The guideline covers three timeframes: before the crisis (how to prepare), during the crisis (how to mitigate, absorb and adapt), and after the crisis (how to respond, recover and learn). The project is not focussed on standardization. The guideline and the developed solutions are currently in the pilot demonstration stage.

3.5. RESOLUTE

RESOLUTE (RESilience management guideline and Operationalization applied to Urban Transport Environment) was the second DRS-14 project that was presented during the workshop. The main project objective is to create and validate guidelines and IT tools to support the resilience of urban transportation systems (UTS); specifically for the road and rail infrastructure. Different types of organizations are part of the consortium, e.g. infrastructure providers, data providers, service and training providers as well as big data mining institutes. In total ten project partners are working together to reach the objective of the project.

Along with the European Resilience Management Guideline, they are developing the following three tools:

- Collaborative Resilience Assessment and Management Support System (CRAMSS): A software platform to analyze critical infrastructures (user group: local decision makers in UTs).
- Training App: The app is game based and is intended to improve the preparation of citizen.
- Emergency Mobile App: Is intended to support local users - especially citizens - during and after a crisis.

The RESOLUTE project would like to standardize ontologies for including data sources from for example sensors.

3.6. RESCCUE

The DRS-9 project RESCCUE (RESilience to cope with Climate Change in Urban arEas) consists of 19 project partners. The main objective is to help cities around the world to become more resilient to physical, but also social and economic challenges by generating models and tools to bring this objective to practice and make them applicable to different types of cities, with different climate change pressures. RESCCUE will also assist cities preparing their resilience plans. The city partners of the project are Barcelona, Bristol and Lisbon.

RESCCUE will use tools that have already been developed and make them applicable to different cities with different climate change pressures. They have done studies on climate variables and poten-

tial hazards. The main tool developed is the HAZUR methodology. It is a software-based tool designed to support the design, implementation and management of cities' resilience strategy. They will integrate different existing tools inside HAZUR.

The HAZUR tool shows cascading effects, for instance it refers the effects of flooding to all other services. It also shows interdependencies of the opinions from experts. The RESCCUE project also tries to develop sustainable tools which can easily be used by cities. The tools should also be not expensive, user-friendly, and not too scientific. Furthermore RESCCUE will generate a final resilience assessment report with the three partner cities and develop HAZUR further as a management tool. The project also envisages the creation of a resilience action plan and new business models. Afterwards this is planned to be applied to smaller cities.

3.7. RESIN

The RESIN (Climate RESilient Cities and INfrastructures) project is investigating climate change adaptation practices in European cities and is assessing impacts and vulnerabilities in order to develop standardized methodologies and decision support tools that cities can use to develop local adaptation strategies. The project is building on previous research by combining existing approaches to climate change adaptation and disaster risk management to develop an innovative, holistic approach that takes into account all of the core elements of the urban system and the ways in which they are interrelated.

The project is funded through the DRS-9 call and four cities are involved in the project: Bilbao, Bratislava, Manchester and Paris. RESIN developed or is developing the following tools:

- E-Guide: Provides decision support for climate change adaptation planning by city administrators.
- Impact and vulnerability analysis (IVAVIA): Tool to support and guide the process of impact and vulnerability analysis for critical infrastructures and built-up areas. Accompanying software use cases demonstrate how users would apply the tool to the various phases of IVAVIA (currently under development).
- Decision Support System (DSS): The System will support decision-making in the following areas: stakeholder analysis, risk and vulnerability assessment, prioritizing between adaptation options and risk reduction strategies, monitoring and evaluation.

- Library of adaptation options: A searchable archive will host the above tools as well as documentation on adaptation measures previously implemented in different cities.
- City Typology: A city typology will identify some of cities' key aspects as they relate to adaptation. Existing adaptation measures will also be surveyed, evaluated and documented in the project's online library.

One of the RESIN project partner is the Standardization Institute of the Netherlands (NEN), which is also planning to develop a CEN Workshop Agreement (CWA). They noticed that terminology is an issue, which has potential to be standardized. Furthermore the project is like the SMR project working together with the ISO/TC 268 (Sustainable Cities and Communities). Additionally they collaborate with the ISO/TC 207 (Environmental Management).

4. PRESENTATIONS OF STANDARDIZATION COMMITTEES

After the presentations of the DRS-7, DRS-9 and DRS-14 projects; representatives of two standardization committees (ISO/TC 292 and ISO/TC 268) gave insights into their international work, procedures and examples of standards that they have developed. The following two subchapters will summarize the main content of the presentations.

4.1. ISO/TC 292 - SECURITY AND RESILIENCE

The presentation was held by Prof. Dr. Rainer Koch, who is a member of the German Standardization Institute. Prof. Dr. Koch explained the legal obligation and stakeholder involvement in the international standardization process. Standards which were developed on an international level can be taken over on European level, but it is not mandatory. If the European level decides to take over an ISO standards, it is mandatory for the member states (national level) to do the same. The cooperation between the International Standardization Organization (ISO) and the European Committee for Standardization (CEN) is settled in the Vienna Agreement. The ISO/TC 292 on 'Security and Resilience' was formed in 2014.

Some of the main objectives are as followed:

- Assess the needs of international standards
- Ensure standards are practical, user friendly and capable of being integrated into other systems and practices
- Support the interests of public and private sectors
- Compile terminology
- Provide requirements and guidance
- Develop and maintain a comprehensive work program and roadmap

The Technical Committee on the European level is the CEN/TC 391 on 'Societal and Citizen Security', which was formed in 2009. The main objective of the Technical Committee is the elaboration of European standards and standard-like documents in the societal and citizen security sector. In Germany the national counterpart lies within the 'Standardization Committee Firefighting and Fire Protection' (NA-031-05 FB). The CEN/TC 391 is divided into two working groups, which focus on the following topics:

- fire protection,
- disaster control,
- preventive fire protection,
- technical support and
- crisis management.

The range of standardization lies in the following areas:

- fire service equipment,
- firefighting and rescue service vehicles,
- fire detection and fire alarm systems,
- fixed and mobile firefighting systems and fire extinguishing equipment to the construction and facilities for fire stations, as well as
- technical, organizational and supervising standards for societal security and civil protection.

4.2. ISO/TC 268 - SUSTAINABLE CITIES AND COMMUNITIES

The presentation of Mr. Vasileios Latinos (ICLEI) gave insights into the work of the ISO/TC 268. The Technical Committee on 'Sustainable Cities and Communities' contributes to the United Nations (UN) Sustainable Development goals through its standardization work. The ISO/TC 268 is important, since standardization in the field of sustainable communities can help communities and their interested parties in both rural and urban areas to become more sustainable. The ISO/TC 268 is working on requirements, frameworks, guidelines, supporting techniques and tools related to the achievement of sustainable development.

According to the TC the proposed current series of international standards will encourage the development and implementation of holistic and integrated approaches to sustainable development and sustainability. A standard that was published by the ISO/TC 268/WG1 is for example the ISO 37101 on 'Sustainable development of communities - Management systems - Requirements with guidance for resilience and smartness'. Currently they are working on ISO 37104 'Sustainable development of communities – Guidance for practical implementation in cities'.

Particularly worth mentioning is that the presentation clarified myths concerning standardization and provided with facts that were useful for the city representatives among the workshop participants. Mr. Latinos described for example that standards are not written by standardization organizations; they are written by experts and that the development procedure usually involves several steps of commenting at national and international level. The publication of an international standard is done by ISO following balloting procedures. It is also worthwhile mentioning that cities do not need to follow international standards like the ISO 37101. Most standards are not mandatory, they are voluntary. These topics and many more were discussed during the presentation.

5. INTERACTIVE SESSIONS

Since the morning sessions fully consisted of presentations, the afternoon sessions were planned to be more collaborative for the workshop participants. The first interactive session was a brainwriting

session, which was guided by DIN. Brainwriting is a creative group-structured brainstorming technique aimed at aiding innovation processes by stimulating creativity [1].

Basically the participants get a pen and a paper and have to write down answers to a guiding question. In this session the participants were split into two groups in two different rooms. Group A included researchers, consultants, a standardization representative from the Netherlands as well as a representative from CODATA-Germany (see classification in subchapter 2.2). Group B consisted of city representatives, consultants and a representative of the Berlin Fire and Rescue Station (see subchapter 2.2). The task was to gather and cluster all solutions developed in the DRS-7, DRS-9 and DRS-14 projects, as well as to identify cities needs and challenges to become more resilient. Subsequently the results of each group were presented to all participants. In the following subchapters the group session methodology and results will be described in more detail.

5.1. GROUP A

Goal

The aim of the session was to exchange information about the solutions/tools that were developed in the DRS-7, DRS-9 and DRS-14 projects, as well as to get an inside into solutions/tools that were developed from others. Differences and similarities were supposed to be identified by categorizing the solutions/tools.

Methodology

The interactive session with the researchers, consultants, a standardization representative from the Netherlands, as well as a representative from CODATA-Germany was moderated by a DIN project manager (see Figure 5-1 and Figure 5-2). The moderator explained the goals and presented the guiding question as well as the proposed clusters of the interactive session. Next, the participants wrote down their answers and allocated them to one of the proposed clusters on a pin board. Afterwards the moderator talked the group through the pin board and facilitated the discussion.



Figure 5-2: Interactive Group A (2/2)



Figure 5-1: Interactive Group A (1/2)

Guiding Question

Which resilience fostering solutions/tools are you developing in your research project and to which of the proposed cluster do they belong?

Clusters

The cluster structure was developed by DIN, TECNUN and CIEM. It was meant to be as a proposal, but the participants of Group A accepted the structure. The developed tools had to be categorised to the following clusters:

- Definition: Description of the meaning of terms.
- Strategy: Development of a plan to achieve one or more goal under conditions of uncertainty.
- Evaluation: Systematic determination of a subject's merit, worth and significance, using criteria.
- Training: Teaching of skills and knowledge that relate to specific useful competencies.
- Implementation: Realization of an application, or execution of a plan, idea, model, design, specification, algorithm or policy.
- Other

Results

The Figure 5-3 shows the solutions/tools from all participating projects. On the left side of the Figure 5-3 are the clusters that have been developed and on the right side are the solutions/tools. The coloured frames stand for the research project that developed the solution/tool. It has to be mentioned that in the interactive session more solutions/tools than in the presentations of the morning session were discussed. This was mainly due to time constraints during the presentations, thereby not all the

work that has been carried out in each project was explained in detail. This explains why there are more solutions/tools in the interactive session than there were in the presentation session.

In summary, the goal of the interactive session, to exchange information, was accomplished. The results give an overview of each projects work and could be the first step toward cooperation. Taking into consideration the different backgrounds of the participants, further exchange is needed. Against this background the following discussion points were raised during the interactive session and can be further talked over in future meetings:

- To which degree do tools and approaches overlap or have different ideas despite similar names?
- Can and should the terminology be unified?
- Is it realistic to propose a standard that will actually encompass different results?
- Should the discussion be dominated by sociological or technological considerations?
- Is our list complete? How could we decide if it is?

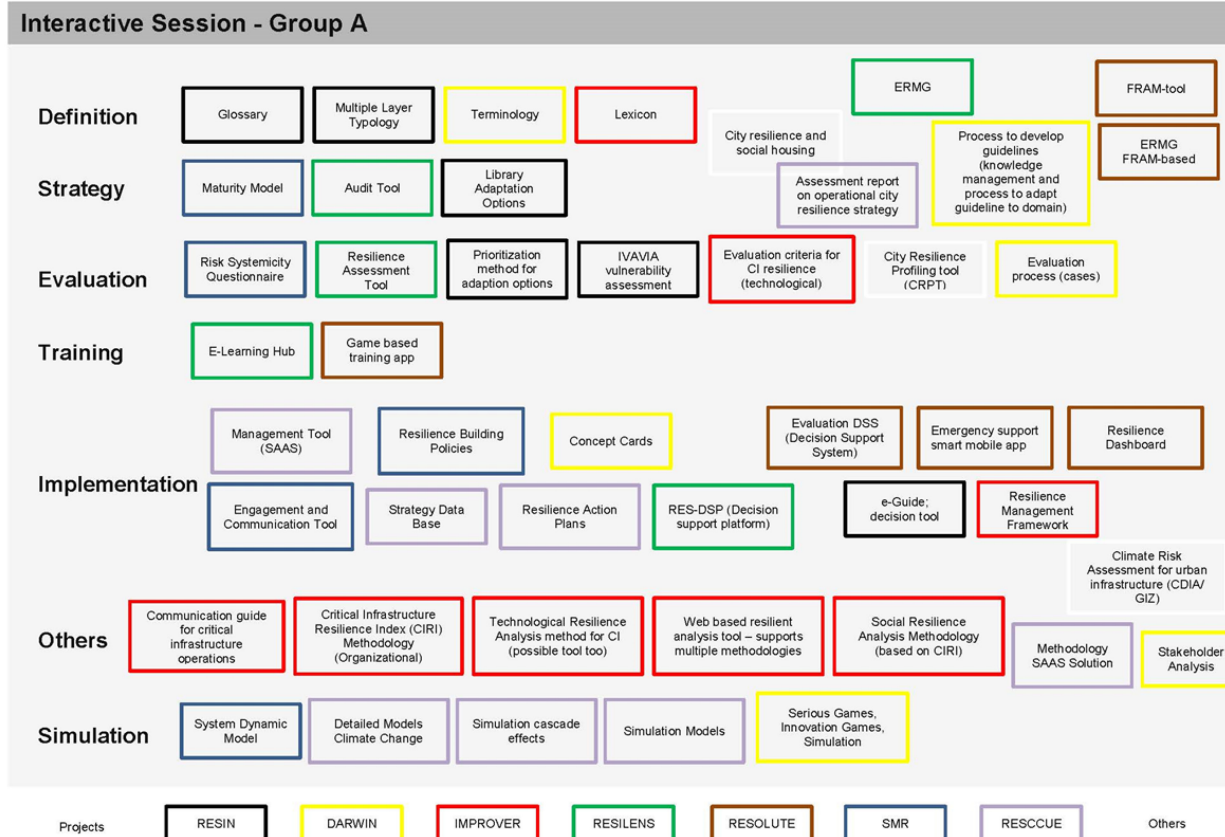


Figure 5-3: Overview of developed solutions/tools

5.2. GROUP B

Goal

The goal of this session was to exchange information about challenges and needs of cities and communities for becoming more resilient.

Methodology

During the interactive session of Group B the participants were split up in two subgroups (see Table 5-1, Figure 5-4 and Figure 5-5). For the first question city representatives were asked by the moderators to individually write down up to three main challenges their city faces. This was followed by an open discussion regarding the topics using a joint board to pin their challenges too. The second and third questions were discussed openly and joint notes were taken on the common board.

The groups consisted of the following cities:

Table 5-1: Group B1 and B2

Group B1	Group B2
Glasgow (United Kingdom)	San Sebastian (Spain)
Bristol (United Kingdom)	Prague (Czech Republic)
Kristiansand (Norway)	Udine (Italy)
Riga (Latvia)	Riga (Latvia)
Vejle (Denmark)	Vejle (Denmark)
Glasgow (United Kingdom)	Rome (Italy)
	Thessaloniki (Greece)

Guiding Questions

1. What are the main challenges your city is facing?
2. What are the experiences in your city on the usage of resilience supporting tools and standards?
3. What are the elements needed to be part of the envisaged European Resilience Management Guideline?



Figure 5-4: Interactive Group B2



Figure 5-5: Interactive Group B1

Results

The outcomes of the two subgroups were summarized together.

1. What are the main challenges your city is facing?

- Climate change (flooding, landslides, also effects on cultural heritage)
- Inequalities (large ageing population, growing gaps between rich and poor, multi-cultural conflicts)
- Critical infrastructures
- Social issues
- Growing/shrinking population
- Terror

2. What are the experiences in your city on the usage of resilience supporting tools and standards?

Tools: The main tools mentioned by the cities were the 100 RC (Resilient Cities) programme and the SMR tools. One reason for the focus on SMR tools could be that the majority of cities were familiar with these tools.

Standards: In the daily practice cities follow standards in the management of hard-assets, such as infrastructure, energy efficiency, green area development, processing abandoned buildings, blackout management, risk assessment and personal data protection.

The management of soft-assets, related to resilience, require new standards. In the current practice is occasionally the interconnection between existing standards missing. For instance, cities mentioned that they do not know how for example ISO/IEC 27000 (Information technology - Security techniques - Information security management systems - Overview and vocabulary) interconnects to sustainability or crisis management standards.

3. What are the elements needed to be part of the envisaged ERMG?

- should include a framework for the governance of resilience
- should include an executive summary
- should include climate adaptation options
- should include mapping of related and important standards
- should express how to fund the work
- should share good practices - should be user-friendly
- should enhance peer-to-peer cooperation
- should involve citizens, local communities and stakeholders
- should give a path to prioritize issues
- must be realistic

5.3. SUMMARY

The summary of the interactive session was done through the presentation of each group's results (see Figure 5-7 and Figure 5-6). All participants attended the presentation and had the possibility to ask questions and to connect with each other. With the interactive session an exchange of all participants was achieved and future cooperation's were built.

For example are the RESOLUTE, RESCCUE and SMR project now jointly developing a CEN Workshop Agreement (CWA) on the topic of 'City Resilience Development through an Information Portal'.

Furthermore the German and Dutch Standardization Institutes are working now more closely together in the development of CWAs. Besides that the cities connected through the identification of similar challenges.



Figure 5-6: Presentation of the results of the interactive session (1/2)



Figure 5-7: Presentation of the results of the interactive session (2/2)

6. PANEL DISCUSSION

To summarize and discuss the activities of the day a panel discussion took place with one SMR project representative (Dr. Sarriegi), one standardization expert (Prof. Dr. Koch) and a city representative (Ms. Robertson from Glasgow). The session was moderated by DIN (Mr. Lindner) and supported by ICLEI (Mr. Latinos).



Figure 6-1: Panel discussion

Results

- The participants of the panel discussion agreed that all projects presented in the morning session deal with complicated data. Against this background it would be helpful to create a data management plan that contains the integration and interoperability of data.
- The creating of a standard on community engagement and cross-sectoral collaboration would also be of use to the public.
- The participants also mentioned that standards could simplify the communication between cities and stakeholders and it could increase the communication capacity.
- One of the biggest challenges is still terminology.
- The developed tools by each project are going through verification by external partners and stakeholders. The results could be of guidance to better understand external partners and stakeholders needs towards standardization.
- As the users of standards are cities, it can be beneficial that cities are from the very beginning involved in the standardization process. All related people should be aligned to the same goal in a holistic way.

7. RESULTS AND OUTLOOK

The *European Workshop on Resilience for Cities and Communities* was attended by 44 people. The day was full of fruitful discussions and the participants had the chance to establish linkages amongst each other. The workshop supported the dissemination of resilience related solutions/tools out of the research projects and the researchers were able to get a closer inside into the challenges and needs of different cities. The feedback from the participants via personal conversations and emails was very positive and the workshop raised the participants' awareness on the importance of standardization for research and innovation. Since the European Workshop took place before the creation of D6.2 'Summary of standardization potential' the information gathered from the city representatives was taken into consideration. For further information about the discovered potentials see D6.2.

All participants agreed to stay in touch and inform each other on upcoming standardization work. Against this background the SMR project invited the participants of the workshop to join the development of their envisaged CWAs. The SMR project is planning to develop standards on the following topics:

- City Resilience Development – Maturity Model
- City Resilience Development – Operational Guidance
- City Resilience Development – Information Portal

The kick-off meeting of the latter one took place in June 2017 in Brussels. Because of the European Workshop representatives of the RESOLUTE and RESCCUE project joined the development group. The kick-off meetings for the other two envisaged CWAs is planned for November 2017 and DIN is going to invite the participants of the European Workshop to join the development of these standards. In summary the European Workshop was a first step towards getting to know each other better. In the future increased cooperation, like the joint development of the Information Portal CWA, needs to be built in order to ensure the development of standards that benefit the public.

8. REFERENCES

[1] Wikipedia (31 March 2017). *Brainwriting*. Retrieved from: <https://de.wikipedia.org/wiki/Brainwriting>

9. ABBREVIATIONS

Abbreviation	Definition or Organisation/ Publisher
ATM	Air Traffic Management
CODATA	Committee on Data for Science and Technology
D	Deliverable
DIN	German Institute for Standardization
EMI	Ernst-Mach-Institut
ERMG	European Resilience Management Guideline
FRAM	Functional Resonance Analysis Method
HC	Health Care
IAO	Institut für Arbeitswirtschaft und Organisation
ICLEI	Local Governments for Sustainability
MM	Resilience Maturity Model
NEN	Standardization Institute of the Netherlands
RC	Resilient Cities
RISE	Research Institutes of Sweden
SINTEF	Stiftelsen for industriell og teknisk forskning
SMR	Smart Mature Resilience
TECNUN	Technological Campus of the University of Navarra
UTS	Urban Transport Systems
UN	United Nations
VDI	Verein Deutscher Ingenieure