Replication Workshop –
"LEARNING FROM THE MOST
INNOVATIVE"
REPORT

LEARNING FROM THE MOST INNOVATIVE

Place: Brno Exhibition Centre, Výstaviště 405/1, Brno, Czech Republic
Date: 05.06.2019
Start/End time: 10:30 – 16:00

Topic and Objective of the workshop

Topic: "Learning from the most innovative"
Objective: The Replication workshop was held back to back with the Urbis Smart City Fair 2019 and the event was opened also to other cities outside RUGGEDISED project. The aim of this workshop was to help the city representatives (whether fellow cities or other European cities) to learn as much as possible about the most innovative city projects throughout Europe.

Replication workshop was "project focused". Meaning that one concrete selected smart solution was discussed during the round table. While some round tables focused more on technical aspects of selected smart solution, others were devoted more to the implementation processes – governance aspects, used business models, public procurement, citizen engagement and data usage. Each round table was facilitated. Facilitators collected information on the most important findings.

Format and agenda

Replication Workshop was structured as follows:

- **Welcome and introduction to the Replication workshop**: **Panel discussion on ongoing replication process in Europe**
- **Replication workshop**: 2 rounds with 5 parallel discussions on specific themes. Attendees could indicate their preference and received information on the themes discussed well in advance.
    Round 1:
        1. Governance aspect of the District Heating and Smart Thermal Grid – ROTTERDAM
        2. Business model towards 100% renewable energy – UMEÅ
        3. Data Based Decision Platform – GLASGOW
        4. BrnoID - services to citizens in an electronic way – BRNO
        5. Holistic refurbishment approach within SMARTER TOGETHER – LYON, MUNICH, VIENNA
    Round 2:
        1. 3D Digital City – ROTTERDAM
        2. Tenant involvement through Gamification – UMEÅ
        3. Smart Car Park and Grid Interface - GLASGOW
        4. Brno Open Data Platform – BRNO
        5. Holistic refurbishment approach within SMARTER TOGETHER – LYON, MUNICH, VIENNA
- **Buildings smart Districts by Lighthouse cities leaders and Replication workshop findings**

The detailed agenda is reported below (Replication WS sessions are in blue):

Time	Agenda
08:00 - 09:00	**REGISTRATION**
09:00 - 09:10	URBIS 2019 Welcome speeches **Markéta Vaňková**, Mayor, City of Brno
09:10 - 09:30	Horizon 2020 and Horizont Europe: Policy context for Smart Cities and Communities **Mark Van Stiphout,** DG ENERGY (tbc)
09:30 - 10:00	City as a dynamic and complex adaptive system - prioritizing energy and climate challenges **Wolf D. Prix**, coop himmel(bl)au (RUGGEDISED Advisory Board)
10:00 - 10:30	Coffee break
10:30 - 11:10	Replication workshop welcome and introduction on replication (panel discussion + instructions) moderator: **Eddy Adams** panelists: **Judith Borsboom** (EIP-SCC), **Brooke Flanagan** (EUROCITIES), **Mario Gualdi** (ISINNOVA)
11:30 - 12:30	URBIS & RUGGEDISED Replication Workshop **Round 1**
12:30 - 13:30	Lunch
13:30 - 14:30	URBIS & RUGGEDISED Replication Workshop **Round 2**
13:15 - 14:30	URBIS & RUGGEDISED Dissemination Session moderator: Ruud Schuthof (ICLEI) panelists: **Jakub Rybář, Katelien van den Berge, Carina Aschan, Gavin Slater, Roland van der Heijden, Lisa Redin**
14:30 - 15:00	Coffee break
15:00 - 16:00	Building Smart Districts by Lighthouse cities leaders and Replication workshop findings moderator: Mario Gualdi panelists: **Albert Engels, Carina Aschan, Gavin Slater, Katelien van den Berge** (RUGGEDISED), **Sonja Stöffler** (TRIANGULUM)

RUGGEDISED Replication workshop venue (**SMART DISTRICT STAGE**)

URBIS Main stage (**URBIS HIGHLIGHTS**)

URBIS Side stage (**DIGITAL CITY STAGE**)

Report of the Replication Workshop

1. Welcome and introduction to the Replication workshop: Panel discussion on ongoing replication process in Europe
This session focused on some key questions and issues relating to the replication process. Four panellists provided their opinion and shared their experiences on the theme:
Joanna Tobolewicz from the Municipality of Gdansk; Judith Borsboom from the European Innovation Partnership for Smart Cities and Communities; Mario Gualdi from ISINNOVA and Brooke Flanagan from EUROCITIES (Replication Leader in Sharing Cities).

Replication is not exactly synonymous of "copy and paste" but is more. It is related to the process of learning from other cities and it is crucial to take into account the context where to replicate IN that can be different from the one to replicate FROM.

This issue is sometimes one of the first challenges for a city that often doesn't know entirely its local context.

Replication means also "look, listen and adopt" and to get any opportunity to learn from Lighthouse projects through direct exchange of opinions, information and expertise. Study visits are one of the best examples for that. It was also stressed the importance of the peer to peer learning as the starting point for a successful replication. One recommendation is to try to maximize opportunities and meetings, workshop and occasions for confrontation. The European Commission should put more attention on making the budget available for this purpose in the new program.

Among the key challenges, the absence of a shared vision and financial problems are the most relevant. RUGGEDISED project offered fellow cities the possibility to create this long-term vision. Moreover, another challenge is the necessity to work cross-domain and to engage business, citizens, policy maker in the long process towards the Smart City. Finally, one of the most difficult is to ensure people that the city where they live is the best place in the country (and maybe of Europe) and to create awareness among people on Climate changes and on the fact that everything is done for protecting people from those changes.

REPLICATION WORKSHOP: Round 1

1. Governance aspect of the District Heating and Smart Thermal Grid – ROTTERDAM

speaker: Roland van Rooyen (Gemeente Rotterdam)
email: rta.vanrooyen@rotterdam.nl

A general presentation of the RUGGEDISED project was provided along with a more detailed overview of the projects under development in the implementation area, Hearth of South District, where 13 Smart Solutions will be implemented. Works mainly consist of the sustainable renovation of an out-dated shopping centre, the renovation of the public transport hub as well as various large-scale multifunctional buildings amongst which a swimming pool, an arts building, exhibition halls and a congress centre. Furthermore, the public space in the area will be drastically redeveloped. With this project the city of Rotterdam will prepare the district for the future with the aim to achieve maximum energy efficiency and CO2 reduction while simultaneously looking to have a major social economic impact in terms of job creation, levels of participation of citizens and quality of life. The ambition is to make energy users also supplier of residual heat.

Focus of the discussion was on the governance aspects related to the Smart Thermal Grid solution.

Currently in Rotterdam there are two big DH infrastructures operated by two different companies and one distribution network serving the city operated by two companies one of which is managing also the connection points. Conflict of interests is one of the biggest issues in the development and management of this project, at the moment. Currently a number of stakeholders are involved in the development and management of the Smart Thermal Grid: Municipality; Energy Operator; Contractor Buildings; End users; Residual Heat producers; Existing Heating Company; Contractor Energy System; Legal Affair permits. Finding a way to cooperate peacefully with all those entities is the challenge.

There is an infinite number of possible governance models that can be adopted for the Smart Thermal Grid and are currently adopted in the Netherlands, e.g.: total public; public with private producer; private with public producer; mixed ownership, etc.

Also, in Poland there are different governance structures, the one adopted in Gdansk consists of a mixed combination of producers: a state-owned company and a local company - private. The main problem of these mixed models is the strong binding that is built between those two over the years, that is difficult to break leading the way to new competitors.

The experience of Rotterdam leaded to two main lesson learned: first, it is important to make sure that there are no conflicts of interests among the stakeholders involved, secondly, it must be considered that realising STGs asks for long term choice from the municipality.

In Rotterdam, as well as in Gdansk and Brno, many users decided to terminate the contract and disconnected from the service. In every case, the main problem can be found in the price competition but in Rotterdam this is also due to the growing need for cooling so that a shift to heat pumps becomes necessary.

Moreover, it seems that people don't think at DH as a benefit for the city (Gdansk), so campaigns for citizens engagement are necessary in some cases. This problem doesn't apply in Netherlands as by law new buildings must be connected to the Thermal grid and local authority may oblige existing buildings to connect to the network.

Nevertheless, the main issue remains economic.

How to replicate?

First, a background infrastructure is needed as well as end consumers. From the organizational point of view, it is important to define responsibilities and identify who has to take decisions on what. Another important suggestion (coming from Umea) was that it is important that the designer of the heating system is also the investor and the main responsible for exploitation.

2. Business model towards 100% renewable energy – UMEÅ

speaker: Kristofer Linder (Vasterbotten County Council)
email: kristofer.linder@regionvasterbotten.se

PRESENTATION SUMMARY:

The project is about finding a business model in 100 renewable energy (especially for the University and University Hospital Area) – 50 000 people/day. 3 partners: University, Umea Energi, Hospital. With RUGGEDISED Umea started to do workshops with brainstorming – what can they do for the area to make it work. They started the cooperation with Sweden. Which are the benefits? They started to collect all the data and they builded the technical model which can help them with simulation of the situation. Then they did the business model with three options – business as usual, Joint Venture and outsourced. They did the business model canva for the new model of cooperation. Now they will sign agreement on this new "Ruggedised to be business canva". The result is innovating block chain technology - smart meters in the system, smart automatized system for buying/selling the energy inside the new system "without the borders".

Without RUGGEDISED it would have never happened. The key is a leadership who wants to work in this direction. Good practice is having a fulltime employee for the project.

DISCUSSION SUMMARY:

In the discussion we have discussed:

• Who was the leader of the project, who took the first step – It was all of them, every stakeholder wants the project to work.
• The hospital is owned by the city or by the university? - Hospital is owned by the county. Umea Energi is the city company.
• Is this model completely new? They found something similar in Brooklyn, but no.
• What the final plan - The future is community energy chain.
• When will you have the pilot project? If we will have the signed agreement we can have that in around one year. Pilot project with just a few smart meters. Now it it a small scale
• Smart meter doesn't cost so much. Which data platform they will use? - It is still a question.
• What kinds of renewable energy do you use? Especially water, wind, geothermal.
• What is the finance model? For example, when you want to buy an energy from the neighbor? – We are still discussing it. The big question is how we will divide the investments.

3. Data Based Decision Platform – GLASGOW

speaker: Gavin Slater (Glasgow City Council)
email: gavin.slater@glasgow.gov.uk,

It has been designed to allow complex analytics on data in real time to support strategic and operation decision making.

DISCUSSION SUMMARY:
In the discussion we have discussed:
• Who was the leader of the project, who took the first step- the Glasgow for the needs of strategic planning and city representatives decisions. It started as relict of Future Cities Project. It is an instrument for "simple, easy to use", generating graphs, tableaus, etc.- in fact visualizing the data on the city in different areas- from brownfields to start-ups.
• Is this model completely new? - Yes. It is entirely designed by the Glasgow team.
• Is the project free and open for citizens?- No it is only used by the council and its organizations. The discussion is led now when/how to open the data to general public.
• The financing - only now subsidised by the Ruggedised project
• The colleagues from Holland suggested usage of Tableau- similar data collector.
• Challenges - continuous financing, not to use personal information, how to make it flexible- live data, provide it for fee to other cities, GIS-IT response merge, development needs skilled people with years of experience

4. BrnoID - services to citizens in an electronic way – BRNO

speaker: Jan Žák (DPMB a.s.)
email: erwin@email.cz

PRESENTATION SUMMARY:
The project idea was about creating user account (in a verified version) and the e-shop which could allow access to all (potentially electronical) services offered by the city and its organizations. The aim was to create a web portal where citizens can create an account to use one service. And they will be later able to use this account for a gradually expanding range of other services. The project has started from the strongest service with the largest number of users = Public transport.
The main inspiration was the functioning of the IS.muni system at Masaryk University in Brno. People from the Smart City team, people from DPMB and two external consultants (with EOC experience) participated in the preparation of the original assignment. An innovative feature was the combination of e-shop features offering access to services and a user account that is perceived from the outset as the identity of the city's residents (bringing the ability to transfer data and discount claims to other systems).
The solution contains:
- electronic access to a variety of services,
- postponed one-time personal verification for full account + online solution of student status towards city universities and ISIC,
- one shared payment gateway (below 0.5% provisions), shared tokenized gateway and bank cards used as identification carriers (for services where it makes sense = EOC, Tourist card, Library card etc.), which essentially results in almost zero costs of these carriers and offers easy access to anyone from all over the world (with contactless card).

DISCUSSION SUMMARY:
We have discussed:
1. How is the interest of others to join this service? The original goal of the integrated user account was confirmed to be correct. The total count of user accounts is now starting to attract more services that its providers want to integrate at their own request.

2. Is there a will to spread out the service into the region? No there isn´t. Despite the fact, that the technical solution is easy the will to join the Brno ID is missing (may be that the service is "too cheap".)

3. How it works with student discounts? The system is interconnected with ISes of Brno´s universities - so the system can control the student status.

4. Are there any other planned modules of Brno ID? Yes, there are. We are going to add modules for participatory approach within the city governance (survey module, idea module etc.).

5. Holistic refurbishment approach within SMARTER TOGETHER – LYON, MUNICH, VIENNA (1st and 2nd round)

speaker: Camilla Wikström (SPL Lyon Confluence)
email: cwikstrom@lyon-confluence.fr

The project is focused on implementation of low energy districts. 3 partners: Lyon, Munich, Vienna. Each city has chosen on one city district / redevelopment area, implementing different measures – introducing district heating, renewable energy, supporting electric mobility, together with citizen engagement in the activities and smart data collection systems. All measures that were implementer are now working on co-financing from the project, the cities are now looking for another economic models enabling scaling up without project financing.

The biggest challenges identified during the implementation of refurbishment were the heritage protection (for the older buildings in need of external insulation, solar panels etc.) and tenant involvement (many countries have rules about 100 % tenants voting for a measure to be implemented in their house…). Ongoing challenges are the involvement of tenants 65+, how to find functional business model combining increased energy efficiency and affordable living, and how to replicate the advisory service for tenants on a bigger scale.

DISCUSSION SUMMARY (1st, 2nd round):
In the discussion we have discussed:
How to reach agreement about higher rent due to costly energy efficiency measures? How to motivate owners to invest into energy efficiency solutions? It is hard to replicate / scale up without subsidies…
Explaining the tenants they will save money on their energy bills, it has to increase reasonably (in social housing there are usually rules about the incensement). It is good to find some "local advocates" – people in favour of that solution, persuading other locals. In Scotland, they have a special loans for those having problems to pay for increased rent due to energy efficiency measures, they are experimenting with crowd-funding / crowd-sourcing etc. They are also trying to motivate private investors and companies to lower the price – use it as a test for their innovative solutions and then show other potential customers that it works.

How does the electric car-share for social housing in Vienna work? What is the experience of other cities?
"Condominium" car-share, the people have better sense of ownership when they share the cars with neighbours, could choose which cars they want, group of locals take care of the maintenance and for that get cheaper fee. Now it runs on subsidies, so it is economically interesting for the people, however they are preparing them for future when without subsidies the rental fee will have to be higher.
Besides Vienna has an integrated city car-share system, some areas experiment with the fee for car-share included as a fixed part of the rent of a flat to motivate people to use it when they have to pay it anyway...
In Glasgow they have a "social" company running the car-share – experimenting with number of participants – now they now it has to be about 260 people on a car to be economically feasible, promote that car-share is cheaper than public transport...
Parma – started with station-based system, now changing for floating.
Utrecht – experimenting with electric car-share, paying by km of usage, subsidized.

How the cities deal with the data-collection?
They have different approaches in each city – in Munich they use the system from Siemens company, in Lyon the city is collecting the data directly, without using any private company. In Vienna they have decided to use an open-source system for data collection.

How did they solve the challenge with heritage protection?
The heritage protection offices should be involved in the process of developing the right measures for the buildings, not just approving or disapproving a final design to save time and money in the designing and projection period (problematic especially for Lyon – the area consists of older buildings than in Munich or Vienna, which are merely in housing estates).

How do the cities involve tenants?
The involvement of tenants is treated in a different way in each city – in Lyon it is a long-term development area, they have established systematic involvement and cooperation with locals, in Munich they have city owned advisory company, advising the tenants in various fields, taking care of their involvement, in Vienna they have a private consultation company specialized in tenant involvement hired for it.
In Vienna there is a "community centre" established in each area, where it is easier to approach the locals and talk to the community (long tradition of "gebietsbetreuung").
In Munich they especially established such a centre, together with local library. Now other city areas want to establish the same. They also used refurbished "truck" for advertising the project and citizen involvement, changing place every week. They combined it with a bike-repair service, which was very popular and successful.
They used the truck in Lyon as well, together with concerts and cultural activities. This approach is very successful and efficient, however very demanding when it comes to personal capacities and expenses.

REPLICATION WORKSHOP: Round 2

1. 3D Digital City – ROTTERDAM
speaker: Roland van der Heijden (Gemeente Rotterdam)
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The solution includes the development of a 3-D city operations model that shows real-time energy consumption and/or production as well as developments over time concerning individual buildings and the whole area. In addition, this model can visualise other data from a host of databases and sensors. This 3-D model functions as an open data platform and makes further innovation possible by making data available for everyone.
This solution arises from the need to solve one of the common problems that is usually found in most of the smart city applications: the silo-development approach. This approach brings different consequences that impact negatively on integrated concept on which the smart city is based on, e.g.: vendor lock-in; no interaction/communication between applications (interoperability issues); the existence of multiple infrastructures; exploding data management; suboptimal benefits and higher (societal) costs; no re-use of data (except by the 'owning' company); data collection and application development cannot be separated.
The platform puts together every single smart city application and allows the communication and exchange of data among sources, sensors, platform, end users, etc.
Concerning financial aspects., the platform is founded by the municipality and partially by RUGGEDISED project. The expectation is that, at the end, the platform can sustain and finance itself.

The experience developed so far by the city of Rotterdam brought to the identification of a number of issues to take into account for the development of the model and for maintaining effectiveness and availability:
- first of all, it is an open platform processing open data and problems are often related to disclosure of data, especially personal data;
- Another issue is related to the possibility to connect with other ICT systems that could be useful source of data;
- Problems of scalability: when working with sensors scalability could be an issue as it becomes more challenging to manage and store a major number of data;
- Last but not least, it is important to have a clear vision on where the city should be in the future and a well-defined idea on how the platform should be developed

The city of Parma is looking at the possibility to further improve a similar platform that, so far, they are using for emergency management. The city is thinking at adopting LORA system for data collection and transfer, it works very well with low transfer of data but doesn't work well for processing more complex and heavier package of information like images and videos. In this case, Rotterdam suggests using Wi-Fi systems that works very well in every case.
Among the next steps, attention will be put on privacy issues, including personal data. It is a complex and delicate topic that sometimes involves the ethical and socio-cultural dimension. For example, the next step could be to install sensors able to identify the number of people in a room and to monitor their movements.

2. Tenant involvement through Gamification – UMEÅ
speaker: Jörgen Carlsson (Umea Energi)
email: jorgen.carlsson@umeaenergi.se

PRESENTATION SUMMARY:
Gamification is the application of game-design elements and game principles in non-game contexts. It can also be defined as a set of activities and processes to solve problems by using or applying the characteristics of game elements. Umeå Energi with housing companies tries to teach people how to reduce their impact on climate change through gamification. The plan is to make and functional app which users fill use for getting the points for their behaviour. For example, for using less lightning, make less waste, walk more instead of using cars etc. The trickiest part is to decide how to "play" with the group and to make them behave like we want just once but to teach them to behave like that for longer period and making it a long-term habit. The important questions in the project are: how much, if any, would people actually change their energy consumption and would this have an effect on their climate impact? The core team in this project is made by building owners, designers, behavioural engineers and marketers.

DISCUSSION SUMMARY:
In the discussion we have discussed:
• Why was chosen tenant involvement? – They started the cooperation with housing company and they wanted to see if it can work.
• How many buildings/flats/people are involved? – around 100 (?).
• How does it work? – People must sign up for the "game", they should use the app for earning the points.
• Was the main goal (reduce the climate change) told people right away? – It is tricky, mostly they were told to make points for reducing their energy consumption, the big goal can be scary.
• How did it start? – There were loads of brainstorming and workshops with the housing company and also with the people where we discussed what can work what not, what are the options and goals.
• What is the goal in this? To reduce energy consumption in the whole city.
• What is the budget? It depends, it is hard to say.

3. Smart Car Park and Grid Interface - GLASGOW
speakers: Ivan Hewlett (SIEMENS), Christine Downie (Glasgow City Council)
emails: ivan.hewlett@siemens.com, Christine.Downie@glasgow.gov.uk

4. Brno Open Data Platform – BRNO
speakers: Martin Dvořák, Robert Spál (Brno City Municipality)
email: dvorak.martin@brno.cz, spal.robert@brno.cz

PRESENTATION SUMMARY:
City planning or design of complicated networks cannot be effectively done without high quality data. Nowadays, it is highly insufficient to use only the official statistical data, thus it is necessary to work with other data sources such as those produced by the sharing economy etc.
Data, Analysis and Evaluation Dept. (Brno City Municipality) is providing high quality intelligence and analytical services to ensure that evidence is used effectively in support of policy making and strategy development in Brno local government. The dep. consists of 6 members (The Boss, geographer, GIS specialist, sociologist, RUGGEDISED project management - 2x). We try to collect and centralize data about Brno. 21st of March 2019 marked one-year anniversary of DATA.BRNO.CZ. The main goal of DATA.BRNO is to provide city data for the public, professionals, and developers. The general public is able to get basic information about the city of Brno, mainly thanks to the City State Report which has become very popular. For professionals and students, on the other hand, we have released many interactive long-term statistics and applications.
Developers and advanced users who would like to connect to the city data through API would be a bit disappointed as there are very few datasets accessible as open data ready for automatic processing. The main reason for this is that we have faced numerous technical difficulties. We can see the greatest room for the improvement in this area and we want to offer more data sets that will be in open formats.

DISCUSSION SUMMARY:
We have discussed these questions:
What are the main problems and obstacles Brno faced during the process of implementation open data portal? The selected data storage system – CKAN doesn´t work properly for more than 2 years now. On top of that it is not scalable, doesn't have second language support and cannot process sensor data. Now we are at the crossroad and we must decide what are going to be the next steps. Can and should we try to fix the CKAN? Should we choose another open source solution, or some other custom-made system?
How can utilize the use of open data at the local level governance? Brno struggles to use data for decision making and policy planning and so do other cities across Europe. Part of the problem is caused by inefficient and malfunctioning data platform. Other participants shared their view and experience. We concluded that as the of data collection and processing has undergone many revolutionary changes in the recent history, many municipalities are only getting the grasp of what should be done and are learning about the effective use of data platforms and software. We have learned however a lot in the past couple of years and we all are ready to build platforms that will meet the needs and requirements of our cities.
The way to improve the innovation processes throughout the public administration which are very often outdated and doesn't change much over time. Basically, bringing the change to the cities is much more difficult due to their nature, complexity and often conflicting interests. This doesn't only require the change in technology but also change in the mindset, processes and whole environment across the city hall. That is much more complex and lengthy process which involves many small steps. Many other cities face very similar issues – such as Umea, Rotterdam or Utrecht.

5. Holistic refurbishment approach within SMARTER TOGETHER – LYON, MUNICH, VIENNA (1st and 2nd round)

speaker: Camilla Wikström (SPL Lyon Confluence)
email: cwikstrom@lyon-confluence.fr

Please see table 5 in 1st round above.