Sustainability service hackathon report

Version 1 – draft

Deliverable 3.3

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List of abbreviations

IMM   Industry meets Makers

Table of content

1. Executive Summary

Promoting city services

Cities often find that useful services they provide are being used by the citizens much less than expected. The SimpliCITY project addresses this issue with pilots that trial and evaluate new methods for promoting city services. These are challenges, competitions and other game-like methods that engage citizens to use and help improve city services. SimpliCITY focuses on services for sustainable mobility (bike mobility), local production & consumption, and digital social inclusion.

Participation in hackathons

The SimpliCITY project aims to integrate and to interact with as many people as possible in order to jointly develop a solution for the city and its citizens. According to this co-creation and open innovation approach the project participated in several hackathons in Austria and Sweden in order to get insights and to benefit from the expertise from students, start-up companies and experts and interested people. The challenge proposed for the Hackathons, organized by local institutions such as the University of Applied Sciences, the initiative "Industry meets Makers" (IMM) or the City of Uppsala and the Sustainability InnoCenter, was about identifying the requirements for *token4sustainability*. These tokens are based on blockchain technology and should support a decentralised solution on how to collect, distribute and redeem collected points. Additionally, we asked on *growth-hacking or a sustainability incentivisation platform,* in terms of building up a service provider and user network, designing a reward system and developing a sustainable platform business model.

Providing the SimpliCITY platform

The citizen engagement methods will not be trialled on any of the city services involved in the project but on the SimpliCITY platform. Technical applications of this platform provide the functionality for the engagement methods. Activities on this platform (e.g. a competition promoting cycling) can be clearly separated from the city information services (e.g. a city map of cycling routes) and of course physical services (e.g. the actual cycling routes maintained by the city). But these areas are related as activities on the SimpliCITY Platform are intended to increase the usage of the city services. This constellation requires being as clear as possible regarding who in the SimpliCITY project is responsible for which services and which data management tasks.

2. Administrative information

Basic information on the SimpliCITY project and the present deliverable:

Project title	SimpliCITY - Marketplace for user-centered sustainability services
Project coordinator	Salzburg Research Forschungsgesellschaft mbH (SRFG), Salzburg, Austria; project manager: Petra Stabauer BSc MSc
Project partners	Polycular OG, Hallein, Austria
	Stadt Salzburg (City of Salzburg), Austria
	Salzburger Institut für Raumordnung und Wohnen – SIR (Salzburg Institute for Regional Planning & Housing), Salzburg, Austria
	Uppsala Kommun (City of Uppsala), Sweden
	University of Uppsala, Sweden
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3. Purposes of Hackathons

The word hackathon is a so-called neologism, combing the words hack or hacking and marathon and was used for the first time in the year 1999 in the course of a software engineering event (Pogačar and Žižec, 2016). A hackathon is an event that is lasting usually for several hours or days and where clearly defined problems need to be solved or predefined topics are covered. Therefore, close collaboration between the participants is necessary and emerging (Zapico et al., 2013). Essential parts of every hackathon build the creativity in problem solving of each participant, various experts with heterogenous qualifications and skills (often for free) and a finished product, service, process, prototype, idea or concept at the end.

While hackathons were predominately hosted for working on and solving software problems, there came along several other participants (e.g. data scientists, graphic and interface designers, project managers) and disciplines. *Hacking* has in recent years been applied to a great deal to non-software or even to non-computer matters. One such area – also highly relevant for SimpliCITY – is urban development, where the collaborative approach of hackathons is applied to different urban problems like overpopulation, inequality, pollution or sustainability.

Another valuable property of hackathon is the fact that problems and sollutions are usually up-to-date and mostly not yet implemented. As SimpliCITY and the platform developed therein aims to make use of the newest technology available, hackathon can have significant impact at different stages. While the major part of technology research and development is done by the project team, hackathons open up this research process to a skilled community. That brings several benefits:

- New and not considered ideas regarding platform structure
- Novel opportunities, methods and software tools for the implementation
- Early fault detection
- Use cases and opportunities for future development or follow-up projects

Finally, the hackathons organised both in Salzburg and Uppsala open our own research process to a wider community to enable a correct evaluation of the potential of these new technologies. Therefore, a guideline and a set of technical tools will be made openly available to hackathon participants for preparation and solution design. Additionally, the solutions designed during the hackathons will be subject to open source access, to be reused by project team and/or other interested third parties without cost (as promised in the proposal).

3.1   Participation of SimpliCITY in hackathons organised in Austria

During the first project year, two different hackathon formats have been identified and visited in Salzburg, which are described in more detail below. Both are not linked to those hackathons organised within the project later. However, both formats were educational for the own organised ones, because two different perspectives could be covered: as jury member and as challenge holder.

3.1.1   Social Hackathon Salzburg, University of Applied Science Salzburg

The Social Hackathon at the University of Applied Science Salzburg took place from the 28th of February to the 2nd of March 2019 at the university. It was promoted as an 'initiative to inspire and create innovative technology and tools that we care about in our daily lives'. Within 48 hours, voluntary social innovators, developers and designers worked together with students of various areas (e.g. Social Innovation, Design and Product Management, etc.) to answer the overall question: How can technology help us create social, behavioral, and practical change for societal challenges? To break it down, the hackathon had a selection of 15 diverse social topics (for more detail, see https://social-hackathon.fh-salzburg.ac.at/2019).

The 48 hours of the hackathon were divided into ideation-, design- and coding phases. The outcome of the hackathon had to be a prototype of smart digital solutions for one concrete societal challenge. While the participants had access to a set of expert advisors and mentors from local organisations, two SimpliCITY project members (Petra Stabauer [SRFG] and Thomas Layer-Wagner [Polycular]) came into action at the final presentations of each hackathon team. The conclusion of the hackathon was with a showcase and pitching competition, where the ideas had to be pitched to Petra Stabauer and Thomas Layer-Wagner and other experts.

The topics of the presented projects were highly relevant in relation to the SimpliCITY focus on local production & consumption and social inclusion. Here a brief overview of the related projects:

- Meetsila: learn sign language via an app that connects learners and native speakers
- Words in Motion: a game that teaches sign language by practicing sign language as a core communication/interaction mechanism in the game
- Foohoo – The social Food-Hood: meet and share ingredients to reduce food waste
- The Blind Spot: an interactive game app that teaches about bullying
- Hero 2 Hero: Connect people with a handicap with volunteers
- Roomy: an app to organize the use of common rooms in buildings

In total, around 90 voluntary social innovators, developers, designers and students participated in the hackathon and provided qualified solutions to the defined problems and challenges.

Discussing the presentations and projects with the other jury experts and the participants of the hackathon one conclusion is, that for new social entrepreneurship projects, apps and services the user acquisition is difficult and costly. Introducing the idea of SimpliCITY that enables cities to promote their own and 3rd party services is beneficial, especially for early stage services of social entrepreneurs and voluntary associations. Enabling those services to be promoted within a larger, incentivised and gamified solution is highly relevant, because the tools created within SimpliCITY can be incorporated in such services early and therefore efficient. With the outlook of the SimpliCITY project team co-hosting a challenge with the city of Salzburg in the next year, the learnings and takeaways of the 2019 Social Hackathon are vital.

3.1.2 Hackathons in the course of Industry meets Makers

The second format within which further hackathons could be attended was Industry Meets Makers (IMM). IMM is conceived as an open innovation community building format with focus on Austria. It aims to initiate new collaboration models between (top) industrial partners on the one hand and creatives or young makers on the other hand. Emerging collaborations should be fruitful for both parties by creating and fostering business and innovation potentials.

The current concept focuses mainly on the fact that industrial companies present "briefings", which are predefined problem statements in future technology areas like robots, augmented reality (AI), 3D printing, internet of things (IoT), big data or blockchain. Makers – a composition of start-ups, small and medium-sized enterprises (SMEs), freelancers, designers, pupils, students and hobbyists – are welcomed to listen to the presentations (briefings) or check them on the IMM website. The actual work starts when makers decide on a briefing and try to solve the underlying problem. To do so, they work together with the industrial partner and start a co-creation process. The entire process from getting to know each other until the outcome/end presentation is limited to a time frame of approximately six month (20th of March until 4th of November). In the best case, a successful, joint follow-up project based on this can then be launched.

Salzburg Research and Polycular got the opportunity to put together a briefing named 'Token 4 Sustainable City Services'. The focus of the briefing was the strengthening of sustainable and integrative urban services through incentivisation, nudging and reward systems and these components should be built on blockchain or distributed ledger technology (DLT). The main goal for makers is to develop a concept or a prototype together with contact persons of the

SimpliCITY project, which should be presented together at the Best of IMM event on the 4th of November.

The kick-off for IMM goes West, which connected local makers from the western region of Austria with the hosts of the challenges, took place at the Grand Garage in Linz, a maker space connected to the Tabakfabrik Linz (innovation, business and start-up hub). It was a networking event and enabled the project team to connect with makers, technology experts, regional policy makers and other challenge owners. The team presented both the challenge and the SimpliCITY project to the participants and had first conversations about both the platform and on technology implementation details of the platform and a token solution. This event and the aforementioned online challenge resulted in contacts with several start-up and SME companies focused on DLT technology and concepts. The detailed outcomes will be described after a brief presentation of the other activities within the IMM format.

Another integral part of the IMM format and therefore also for the briefing offered by the SimpliCITY project team are different kind of events that took and take part in parallel of the above described process. One type of event1, which is also highly relevant for SimpliCITY, are hackathons. Selected members of the project participated in two hackathons, which are described in more detail below.

Infinion-Hackathon

During the #IMMgoesSOUTH-kick-off event on the 26th of March in Graz, the briefings of all industry partners were presented again (after an initial kick-off event on the 21st of March in Linz) in front of a group of interested makers. After this industry pitch, a shorter version of the briefing was presented in front of 25 participants of the Infinion-Hackathon. The briefing was designed as problem, which had to solved within two days in the form of concepts, prototypes or business ideas. The problems for this hackathon were settled in subject of drones, sensors and blockchain.

1st Future Tech Bootcamp on Blockchain, IoT & AI

From June 25th until June 28th, another event of the IMM format was hosted, which is from its characteristics similar to a hackathon. It was an intensive 4-days co-creation session with focus on IoT, artificial intelligence (AI) and blockchain. The event enabled industry and makers to co-create together with the support of tech experts and with the help of innovative tools and infrastructure (developer kits, chips, access to rapidM2M technology, LoRaWAN, cloud, relevant data and blockchain platforms and the electronics laboratory of the FH St. Pölten, etc.) new IoT, AI & blockchain solutions with real practical relevance.

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1 To see the full range of events and the chronological order, check https://www.industrymeetsmakers.com/programmpunkte.

In total, around 60 participants joined the event, of what two thirds were makers and therefore participants of the hackathon-like format. The briefing hosted by SimpliCITY, which was presented before (see above) was edited slightly and presented again in front of the group. In order to specify the briefing, some general conditions were added.

In connection with the activities already mentioned the following calls and conversations were made:

- **Srdjan Kupresanin** (Blockstruct GmbH, 0bsnetwork, Vienna). Blockstruct with its 0bsnetwork represents a technology provider offering a platform that lowers the hurdle for retail and loyalty tokens, tokenizing ownership for shared vehicles and mobility and many more B2C, but also B2B like supply chain networks use cases relaying on a technology that it decentralized, fair, immutable and trustless ledger of data and transaction. In the call topics like cost-effectiveness, scalability and energy consumption of the mechanism ensuring consensus. With the NG-DPoS algorithm 0bsnetwork provides a state-of-the-art consensus mechanism that also guarantees fast transaction rates necessary for real-time applications. The perspective of Blockstruct on the idea of a 'Token 4 Sustainable City Services' is, that it would be possible to integrate a token system underneath Simplicity. The most crucial step would be to create a proof of concept for the gamification and incentive system that is able to be widely adopted by different systems. If these prerequisites are met, an expansion of the SimpliCITY utilizing blockchain does not only seem possible but provide the benefit of an open platform and interface that the connected services could implement.

- **Gerfried Cebrat** (EPU, Graz). With Gerfried Cebrat the team discussed applications around mobility telematics, energy (charging and security) and shared mobility solution. Tokens could play a vital role in incentivizing an environmentally use of mobility.

- **Lukas Görtz** (Block 42, Graz). Block42 is a Graz-based company focusing on consulting and technical implementation of digitalisation and blockchain project. The work on typical use cases like supply-chain management and bring in expertise with several DL technologies such as Ethereum, Hyper-Ledger, IOTA or holochain. They also agreed on the feasibility of a token solution and benefit that a DLT solution could bring regarding service integration and a decentralized interface for service providers but insisted that the concept on gamification and incentivization needs to be thought through and tested.

- **Simon Pfeifhofer** (Distributed Ledgers GmbH, Innsbruck and Tributech Solutions GmbH). Simon Pfeifhofer is CEO and CTO of two companies specialised on DLT solutions. One of the projects that he highlighted is Digital Bike Twin, which is a Fraud-detection-solution for bike and e-bike sharing solutions. This project builds upon

specialized hardware that utilizes narrow band IoT on the blockchain. The built tracker is therefore very energy efficient and has a small footprint to be integrated into a frame.

The system also provides reliable data for smart-cities and additional services. This solution highlights the potential of connecting IoT with DL technologies and that could leverage potential also for future developments regarding SimpliCITY.

Token 4 Sustainability Expert Call:

- o Georg Schön (Good, Vienna)
- o Christoph Zinganell (Collective Energy, Vienna)
- o Christian Baumann (EPU and maker)
- o Srdjan Kupresanin (Blockstruct GmbH, 0bsnetwork)
- o Thomas Layer-Wagner (Polycular)

In conjunction with IMM an expert call was utilised to connected different stakeholders that are working or planning on creating a token for sustainability and CO2 emission compensation. The details of the call remain under disclosure due to request of participants. Overall all parties agreed that one solution that is flexible and open to be integrated by several parties is beneficial and should be aimed for. The SimpliCITY team spotted some differences offering tokenized CO2 compensation in comparison to tokens that you get by sustainable action. The SimpliCITY team offered support for discussing requirements of a tokenized solution in connection to a city service aggregation platform and a city perspective.

Parallel to the hackathons in Salzburg, the SimpliCITY project team participated in events in Sweden, which is described below.

3.2 Participation of SimpliCITY in hackathons organised in Sweden

3.2.1 Sustainability Hackathon, Sustainability InnoCenter Uppsala

On the 29th of March, the Sustainability InnoCenter (working together with Uppsala University and the Center of Sustainable Development (CEMUS)) organised a sustainability hackathon event in Uppsala. Participants of the hackathon addressed the following questions: Are you interested in contributing to a more sustainable society? Do you want to come closer to renown companies and experts working with sustainability? The hackathon started with a number of presentations and a panel of sustainability experts. Then, the hackathon challenges were presented.

The SimpliCITY project team presented one of them with the underlying question: *How to hack growth for sustainability incentivisation platform?* Hackers needed to come up with content for the SimpliCITY platform, a possibility to access multiple services on the platform and the

creation of ideas about simplifying the consumer experience. Additionally, suggestions concerning a (sustainable) revenue model and a strategy for reaching consumers was requested.

The Sustainability Hackathon enabled the generation of 35 creative solutions and ideas of green technologies and sustainably innovations that transcended areas of expertise and national borders to real-life scenarios presented by the companies and rganizations.

In the end, four teams were elected as prizewinners by the jury, whom among others, got offers of internships at Vattenfall, business guidance from Drivhuset and an opportunity to assist the Swedish CleanTech Challenges winners (e.g. others than the Hackthon finalists) to London's Global final. Additionally, more than 10 teams were directed on further development of their ideas in the future with other possible internships.

4. Lessons learned (up to now)

- Hackathons are a useful format as an add-on for the SimpliCITY aspirations. External parties deliver valuable input and fresh ideas and they offer new background and proficiencies, with which the tackle SimpliCITY related challenges from different angles. The limited but intensive time slots of hackathons allow a deep dive into the presented briefings and results often in focused concepts or prototypes.

- The feedback regarding the SimpliCITY briefing (in its different versions) was above average and gave as the comfirmation that we are on right track with regard to hackathons. The flexibility of the format will give us the chance to participate also in upcoming hackathons in both the pilot cities and locations outside of them.

- The expertise of people participating in hackathons depends highly on the proposed theme of the hackathon. In order to gain more people with firm skills in blockchain, sustainability and incentivisation, a self-organised hackathon in Salzburg or Uppsala is conceivable.

5. References

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