

BACID Workshop

Smart Sarajevo 2030

Imagining Sarajevo of the Future_Vision Framework

Working Paper - September 2019

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Edited by Dominic Weiss, Nikolaus Summer, Walter Palmetshofer

1 Introduction

Sarajevo, Bosnia-Herzegovina's capital, is running a smart city initiative since 2018. It is already supported by a variety of local stakeholders from the public and the private sector. The city's focus is currently on developing a compelling vision within a recently built framework "*Smart Sarajevo 2030. Imagining Sarajevo of the Future*". One primary goal is to improve the City's general approach by putting Sarajevo's transformation into a more liveable, sustainable and smarter city on a solid organizational foundation. In this context, it is of vital importance to strengthen the administrative capacity of the Municipality of Sarajevo and other relevant public institutions such as the Canton of Sarajevo or the districts governments. Open collaboration with additional stakeholders from business, research and civil society shall be equally fostered.

For this purpose, the City of Sarajevo is being promoted in the BACID program – Building Administrative Capacities in the Danube Region - of the Austrian Development Agency. BACID facilitates an exchange of information and best practices with Smart City Vienna. Urban Innovation Vienna (UIV) and its Smart City Agency, acted as Sarajevo's partner organization in a respective call. From June 24 to 26 2019 a three-day workshop brought three Austrian and approximately 15 local experts together to critically compare and analyse the Smart City processes and status quo in Sarajevo and Vienna. Multiple references to other international benchmarks were made to support the people of Sarajevo in their approach. As the workshop is thought to be a means of first-level support tacit knowledge and practical experiences (dos & donts, achievements & failures etc.) were under debate. Experts intended to sharpen and contextualize the local view on Sarajevo's strengths, weaknesses, opportunities and challenges and to identify starting points for future collaboration.

This working paper is an edited summary of the workshop content. The text outlines the main course of discussions and provides references etc. UIV considers the document as suitable only for internal use by BACID partners. Chapter 2 briefly describes the status quo of Smart City Sarajevo. Drawing on that, Chapter 3 provides an overview of the most important pending and trending topics under debate. Experts' topical focus was put primarily on Vision and Strategy, Governance, Consequences of Technological Innovation, Digital Implications and the Value of Urban Data as well as on the role of projects and their impact on Smart City communication. As various stakeholders have established a „City Mind Lab platform“ in Sarajevo the utility of open collaborative platforms was extensively discussed too. Chapter 4 refers to Viennese experiences to bolster arguments, points and inferences whereas Chapter 5 includes an outlook at suitable next steps.

2_ Status Quo¹

The City of Sarajevo, together with many stakeholders – public, private, civic, academic – has embarked on the way to make Sarajevo a smarter city. In order to progress from singulary pilot initiatives towards a substantial transformation driving governance decisions, technology investments and enable higher quality of life in Sarajevo, the City needs a far-sighted vision to set a pathway. A Smart Sarajevo 2030 vision framework is supposed to provide a future-oriented, participatory and politically owned pathway for Sarajevo's transformation into a future city.

However, Sarajevo has a complex government structure with *three layers of governments*. Each level has specific responsibilities and functions that are relevant for urban governance, investments and public service delivery – e.g. canton of Sarajevo, city of Sarajevo and its four constituent municipalities. Consequently, a strategic framework needs to be collaboratively designed and endorsed by all levels of government, citizens, private sector, civil society and academia.

As local governments will enter a new program cycle in 2021 such a framework for short- and long-term actions and public investments should be thoroughly developed in stages until 2020 (analysis, vision, pathway, implementation). In this case, Smart Sarajevo 2030 may well be operationalized via strategic and operational documents for the period 2021-2027. These could also inform local government leaders of Sarajevo prior to upcoming elections in 2020. Moreover, the European Union launched its Digital Agenda for the Western Balkans in June 2018. A *Smart Sarajevo 2030 vision framework* may also serve as a precursor for strategic priorities in that regard, thus attracting pre-accession assistance beyond 2020.

Apart from singulary project calls and initiatives by United Nations Development Programme for Bosnia-Herzegovina (UNDP) promotion and the Smart City initiative of Sarajevos mayor have to be taken into consideration. UNDP and the City of Sarajevo are facilitating a so-called *City Mind Lab*. It should promote networks of prominent, knowledgeable and innovative citizens of Sarajevo to discuss the Sarajevo 2030 vision and values. Furthermore, City Mind Lab should contribute to design and set up of a Smart Sarajevo communication platform as well as explore possibilities for a basic city info system serving as foundation for smart city data collection and management, as well as for the creation of the virtual reality.²

¹ Cf. City of Sarajevo (2019): Smart Sarajevo 2030. Imagining Sarajevo of the Future. Vision Framework. Methodical Note

² Smart Sarajevo Initiative City Mind Lab: Road-map For The Process Ahead

3_Pending Topics

3.1_Smart City Vision and Minimum Viable Strategy

„Structure follows Strategy“ (Alfred Chandler 1962)

A common mind-set is a tremendous asset if available as an articulated strategic document. A *vision framework Sarajevo 2030* can unite stakeholders at all institutional layers³ and forms a basic narrative to build around.⁴ A vision framework provides guidance and should be further concretized in a consensual *minimum viable strategy* (MVS). A MVS puts its focus solely on Sarajevo's strength and its most urgent needs!

A MVS should only address a few *selected areas and topics* (digitization, energy, mobility, public space design, health or tourism etc.). Amendments and more specific sectoral programs are the appropriate format to clarify technical details. With a Smart City learning on a project by project basis content should be generated and managed consistently around a coherent set of core messages. Whereas meaningful and measurable medium-term and long-term objectives have to be defined in selected areas. It is important for Sarajevo to keep such a document lean in order to avoid content overload and bureaucratic hassle.

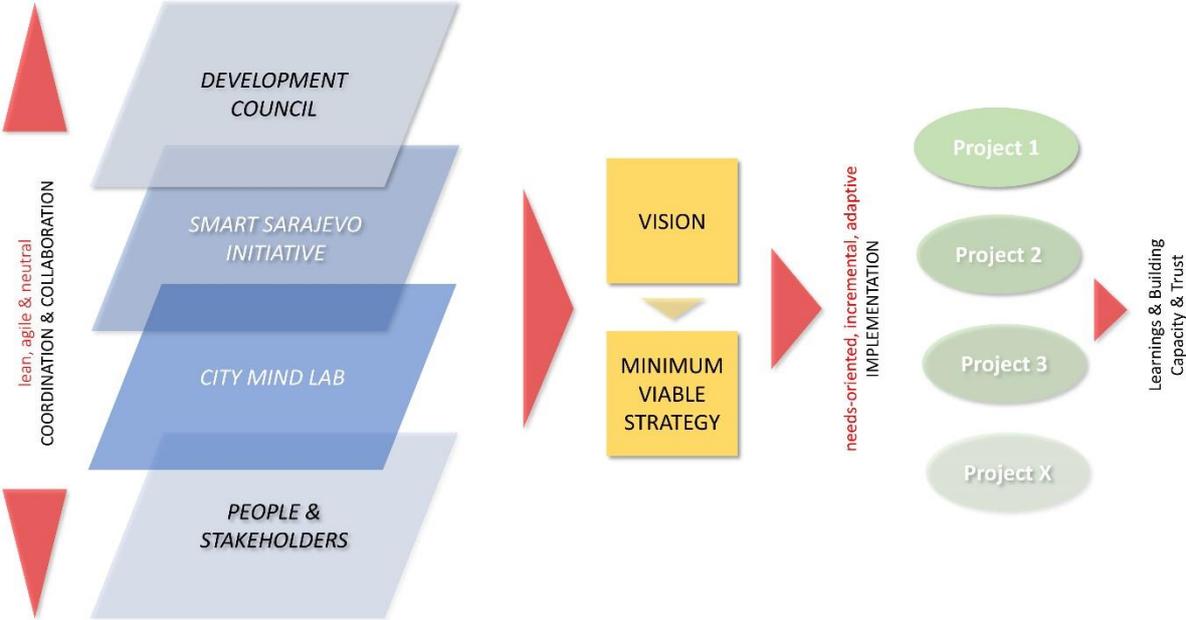
If too many goals, challenges and tasks are addressed at an early stage infant programs like Smart Sarajevo could easily digress and derail due to fragmentation and a lack of resources leading to subcultures and organizational silos. Instead, additional areas of urban life can be addressed at a later stage of a Smart City transformation when further institutional capacity is being built in the long term. Regarding its current status, the Smart Sarajevo vision framework should rather focus on smaller and feasible projects that are highly relevant to people. If *pilot projects* turn out to be successful they will raise awareness and serve as references to promote further activities.

However, a MVS must draw upon a common mind set. City Mind Lab formats (e.g. meetings, salons, chats, afterwork get-togethers, online games etc.) could be used to discuss and specify what Smart Sarajevo is supposed to be in 2030. Such a common understanding/story should be jointly developed around *values and believes* rather than concrete measures and tasks. Deliberative processes (online and offline) should be fully transparent from the beginning. In case

³ The importance of internal communications should not be overlooked, see online under <https://hbr.org/2015/07/communicating-a-corporate-vision-to-your-team>

⁴ Vision Statement Blueprint: Smart Sarajevo 2030 – Bosnia Herzegovina's capital of short distances surrounded by mountains, forest and water - puts its focus on cleaner air and sustainable transport in the metropolitan area as the community is starting to build on the City's true assets: Its close proximity/short distance to natural habitats (wood, rivers, hydro and geothermal energy), stewarded by mountains hosting the olympic spirit (hiking, mountain biking etc.) will fit perfectly with Europe's most walkable capital fostering all sorts of green active mobility. Sarajevo aims at a bright future with a commitment to dense, mixed-use urban quarters inviting Sarajevo's diverse local population as well as people from all over the world to share a more sustainable, healthier and active city-life.

of a bottom-up approach various audiences can be addressed to submit, evaluate and select proposals enhancing the vision framework’s legitimacy.



Usually, Smart City approaches imply many overlaps between topics (and target conflicts) due to their inherent complexity. That is why one compelling story, one common mind-set, one positive narrative is so important to frame the engagement of various stakeholders with different interests over time. Similar to corporate brands, an MVS shall provide basic orientation to promoters, project champions and contributors alike by defining specific areas for early activities (considering „low hanging fruits“ and „pain points“).

Complexity and volume of a MVS document are likely to increase if Sarajevo opts for a co-creation approach asking its citizens to contribute to enhance legitimacy and power of a common story. Smart Sarajevo has to find the right balance between feasibility and legitimacy. As a Smart City initiative’s main objective should always be to raise awareness as well as to align scarce resources effectively to promoters we recommend to pursue a step-by-step approach. A concise positive story has the potential to bring together various stakeholders and organizations such as canton, city, district-level municipalities and players from the civil society circumventing parallel structures.

Wording: It is by no means necessary to use the term „smart city“ or „smart“ all the time. In case of non-specialist target audiences these terminologies can also create confusion due to the many different interpretations circulating.

3.2 Governance and Consequences of Technological Innovation

With regards to the Smart City Vienna process one has to point out that Smart City is a *horizontal challenge*! For instance, in the City of Vienna's Smart City Ecosystem at least 100+ organisational stakeholders are involved, employing almost 100.000 people. It is impossible to involve everything and everyone from the beginning. Focussing on willing people is crucial. Likewise, lean *coordination and governance* are needed on top of a stable institutional structure. A proper government structure combined with effective communication can leverage all sorts of strategic efforts within a Smart City framework:



Whereas Sarajevo will need basic processes for guidance and coordination it should keep its *startup mentality*⁵ and grow on a project by project basis into the mainstream. Iterative learning and a step by step approach seem to be appropriate to build on strength and real needs. „Pain points“ might help to focus on real priorities such as air pollution and urban transport. If resources are scarce maintaining a strategic focus will be even more important. Overambitious „moonshots“ must be avoided.

Instead, „City Mind Lab“ (see also point 3.3) could act like an immature startup pursuing a trial and error approach rather than developing a holistic SC strategy like the City of Vienna did. Smart City Vienna has to adjust regularly and is not able to tackle all urban challenges at the same time. Instead, 2-3 priorities, drawing upon Sarajevo's strength and needs should be put into a hierarchy with City Mind Lab clarifying what stakeholders can do to participate (Call-to-Action). In Sarajevo's case this could be done without the burden of high financial and emotional switching costs due to a lack of multiple sectoral investments already being made.

⁵ Cf. Ries, Eric (2011): The Lean Start-up.

However, a *governance system* has to make sure that the vision framework's core (MVS, values, beliefs, main goals and messages) will never be abandoned. A governance structure should focus on implementation (and compliance) and suitable for subsequent growth:

- Identify motivated people, relationship and power promoters, focus on the young and the willing in the Society.
- Implement demo projects (of limited scale) as visible positive examples but be aware of the output (education, awareness, showcase, feasibility).
- Be fully transparent from the beginning (goals, status quo, challenges & achievements, participatory formats and follow-ups).
- Identify and focus on strength and potentials (city of short distance, walkability, bikable city; hydro and geothermal energy, tourism and leisure areas) as well as on most pending needs (air pollution, motor traffic: awareness, education, operative measures) to start with.
- Develop a methodology to measure processes (data driven decision making), identify must-have-solutions and nice-to-haves referring to clear indicators (carbon footprint etc.) and prioritize accordingly.
- Create win-wins to unify stakeholders and form working coalitions / groups. Analyse the consequences of innovations holistically (opportunity and switching costs, lifecycle analysis, financial and social values etc.).
- Be aware of long-term uncertainties featuring multiple contingencies. Pursue a coherent but to some extent adaptive, iterative approach that allows a conversion of uncertainties into manageable risks (on a case by case basis) over time.
- Focus on a better alignment of existing resources being complemented by additional fund raising (international calls etc.) in partnership with (international) institutions/research institutions/networks. Do not participate half-heartedly in big international calls but join consortia as a (junior) partner.

Smart Cities also need to thoroughly analyse long term consequences of technological innovations to be applied/rolled-out. Concepts such as the Radiant City or the Motor City - renowned and promoted in the first half of the 20th century - had disastrous consequences for cities all over the world putting their current chances to meet their sustainability and liveability goals into jeopardy.⁶ What turned out to be true for physical infrastructures must also be considered with regards to a sustainable design of a city's long term digital infrastructure.

That is especially true for cities that want to be part of an innovation ecosystem by definition. For instance, it is questionable whether the entire range of urban processes needs to be organized with Distributed Ledger Technologies such as a public blockchain as innovators are likely to run into other issues (privacy, energy efficiency and rebound effects, bias, technical path dependencies, surveillance, data leakage etc.) The main question is whether cities always need to focus on the most sophisticated technological solution.

⁶ Smith, Ben (2019): The Smart Enough City.

To find out whether approaches „break a fly on a wheel“, real benefits need to be weighed with the total effort required (opportunity cost). If a Smart City vision framework puts people at the heart of the process it is questionable whether drones (operating on comprehensive data infrastructures featuring sensors, cameras, protocols, broadband, databases, processing capacities and learning algorithms etc.) are really the best way to deliver pizza to peoples' homes. However, for many compelling use cases - imagine medical transports in emergency situations in areas prone to traffic congestions – such technological innovations will be indispensable if thoroughly evaluated!

3.3 Open Collaborative Platforms – The City Mind Lab

The City Mind Lab with more than 100 activists and promoters is a promising starting point for Sarajevo to develop. However, Smart City is a *dynamic transformative process* with all stakeholders being likely to evolve over time. The key question is what role Sarajevo's City Mind Lab might have in the long term? If an informal platform exceeds a certain threshold/size/complexity governance structures and functional interfaces to existing institutions and the political landscape will be needed.

With a political development council being established by law involving the prime minister of canton, the mayor of the city and municipal mayors and with an UNDP supported Smart City Initiative of the City of Sarajevo⁷ City Mind Lab is well positioned as an open collaborative platform. As such it is comparable to *Digital.City Wien*. If initiated by the municipality platforms are likely to raise high expectations. What is this platform supposed to be? A hacker- or makerspace, a playground inviting and matching the motivated, creative with the willing? A permeable interface between formal public sector entities such as the city or canton and engagement driven volunteers promoting activities inside their communities?

If City Mind Lab is supposed to be an integrating collaborative platform – owning the common story of Smart Sarajevo – it could be a bridge to companies, entrepreneurs and people from all areas of society in Sarajevo. A Stakeholder analysis could help to identify further outstanding individuals⁸, potential project champions and Smart City promoters to convince other people about the overall process. At early stages, people of local relevance are most likely to be valuable contributors. But if things become bigger there is no reason why testimonials with higher publicity should not support the City Mind Lab's good spirit.

A low-cost Wordpress Blog to provide City Mind Lab with a provisoric web platform/landing page is recommendable in the first place. Also, Whatsapp and Social Media can be used to better coordinate communications online. However, offline formats are most important to establish trust and to activate people. Coordination shall be held at a minimum level since informality spurs creativity and flexibility. The likelihood is high that private sector players will not have sufficient

⁷ See online under <https://sarajevo.ba/sarajevo-smart-city-inicijativa-zvanicno-zapocela/>

⁸ Cf. Gladwell, Malcolm (2000): The Tipping Point.

time resources available to provide coordination constantly. Perhaps, the City of Sarajevo etc. could support here without being all too visible. In Vienna, it turned out to be crucial not to disincentivize external players who were skeptical about public sector engagement at the start.

Reputational risk is a constant challenge but every single startup company in the world is dealing with the same issue before a solid brand is established. Value propositions and expectations management have to be aligned. Volunteering participants who work for 40 hours need to be incentivized rather intrinsically to join hackathons etc. (entertainment, fun, contribute to a common good, meaningfulness) but, most importantly, people should not have the feeling that they waste their time! In this context, bureaucratic programs could be somewhat of a disincentive for people who look for open creative spaces. Instead, a new cultural approach could also nudge a municipality or other formal institutions and their employees to open up and invite people to foster a personal trustworthy dialog.

Having said that, it is unlikely that such a collaborative platform can be the coordinating entity at higher administrative or political levels nor can it be – apart from small projects and communication campaigns – in charge of technical project management. Those functions are not supposed to be performed by informal institutions. With regards to experiences in Vienna emerging institutions like City Mind Lab should have clear mission boundaries with other competences being assigned to specialized entities (cf. formal governance, neutral yes-team/change agent, technical project management etc.).

3.4 Project Focus (as a key to grow from the niche)

A *pilot or research project* can be used to address specific needs of target groups in Sarajevo making use of additional funding. Applications (maybe with multiple partners from Sarajevo and abroad (city, canton, university, international partner, NGO etc.) do not require a MVS per se. With certain Hackathons, UNDP Calls for Proposals and a smart testing area in Stari Grad being first steps already made, Smart Sarajevo has to follow up with comprehensible and manageable projects.

Communication wise, projects are very useful to reduce the complexity of the Smart City endeavor. A city's transformation into a Smart City is always a longterm process touching all areas of urban life and thereby not always easy to digest for laymen. On the contrary, single projects are more comprehensible and can be better understood if they are relevant for people in their every day life. For instance, a project to empower senior people how to buy and use tickets with smartphones is relevant for them as they use different means of transport everyday. Whereas a sophisticated blockchain based energy trade prototype will be irrelevant to them and too complex to absorb.

Moreover, a successful project provides a proof-of-concept strengthening the Smart City story and related arguments. It is of the same importance as professional references are for companies at a sales pitch.

The scale of projects can be small at the early stage. It is way more important that projects are truly relevant for target groups (cf. focus on must-have solutions). For example, participatory budgets at a local level and of a small scale can have several benefits: Mobilizing people and local project promotion with increased legitimacy, additional inexpensive formats to communicate and contact with a potentially high leverage. Working with donors of integrity or using gamification and/or idea competitions are additional alternatives to raise awareness and foster (open) innovation. But in any case it is important to design formats in a way that promoters and change agents can keep their promises by seriously addressing winning proposals etc. with follow-ups and reasonable responses. Some further implications for project communication should be considered:

- Every project can be interpreted as a mini campaign
- Every project should be visible and bring a clear benefit observable by the respective target audience
- Every project should be relevant to the respective target audience (in everyday life)
- Every project should have the potential to create positive emotional arousal (fun, astonishment etc.)⁹

3.5 Communication and Smart City Marketing

A communication strategy has to be *taylor made* and properly adjusted to make a target group receptive for selected content and messages. As stated in chapter 2 a common vision / narrative can anchor the entire internal and external communication effort. As such it is a prerequisite for coherence and effectiveness. The use of projects as „communication containers“ to reduce the complexity also makes sense. Projects allow participants to focus on topics that are relevant for them whereas Smart City core messages can be disseminated on top of it.

With regards to the City Mind Lab it is evident that organizations and platforms will need more coordination and more formalised processes to be governed and monitored as they grow. Whereas young entities strive due to informal communication, creativity and flexibility.¹⁰ This has to be taken into consideration if a platform is supposed to remain a less formal but flexible network such as Digital.City.Wien (see also Chapter 3.3 and 4).

In any case, it is recommendable to be *fully transparent* from the beginning as trust will be the decisive currency throughout the Smart City journey! It is from utmost importance to build

⁹ Berger, Jonah (2016): Contagious.

¹⁰ Cf. Greiner, Larry E. (1998): Evolution and Revolution as Organizations grow, see online under: <https://hbr.org/1998/05/evolution-and-revolution-as-organizations-grow>

reliable networks and local partnerships for the long term. In this context, it is also wise to keep a healthy balance between upright value-oriented communication efforts and promotional or even advertorial tactics servicing specific commercial interest – especially at earlier stages of the process. Operations must be evaluated thoroughly whether they are truly in line with core values of the program and value propositions of respective products and services offered.

As Smart City is also perceived as a promising market opportunity by industrial heavyweights and other businesses many of the technologies and services developed and offered could be of great use. The transformation of our cities into more sustainable and livable habitats can be facilitated if technologies are procured, implemented, promoted and managed intelligently by competent and self effective cities.

Within a Smart City process a team of *neutral innovation/information brokers* („yes team“, proactive relationship promoters) has to find innovative people and willing partners to further develop the process. Spreading relevant knowledge and raising awareness can be done via mass and social media channels and/or in real world communities. However, findings in diffusion research indicate that personal interaction (physical proximity) and subjective peer evaluations are indispensable when it comes to nudging people to make a decision or change their behaviour respectively.¹¹ Methodically, techniques like storytelling and framing may well increase the efficiency of communication efforts too.

With regards to City Mind Lab an ongoing schedule should be available as people from different groups connect with one another. Acting as an informal point of contact for various topics, as an entry point into the city administration for people who want to do something, the decisive currencies are trust and transparency! Opening up, establishing a platform as the point to go should be the goal! Of course, certain issues at certain stages cannot always be transparent (e.g. immature project plans etc.) but a credible culture of communication will facilitate appropriate formats off-the-records and on-the-records. The degree of formalization will depend on development status, project size and respective needs of participating stakeholders.

With all its seriousness given, a Smart Sarajevo should also allow its protagonists to „ease off“ at times. Some agencies¹² intentionally utilize humour and fun to resolve conflicting interests and target conflicts. Such tactics may well be an option to close the gaps between formalism and informality. That a Smart City approach needs to be serious is beyond debate. However, its promoters should not forget to use the power of creativity and humour in order to initiate human interaction. That engaged citizens should not have the feeling that they waste their time serves as a practical bottom-line when it comes to ponder about the right approach.

What's more, the *availability of data* and related evidence require a new approach to communication – especially by public sector entities.

¹¹ Rogers, Everett (2003): Diffusion of Innovation.

¹² Cf. <https://www.nonconform.at/#start>

3.6 Digitization and the Value of Open Data

Open Data can be a foundation of Smart Sarajevo Vision Framework as it facilitates a transition towards a digital infrastructure that resolves the challenges of the city and its citizens through a more democratic use of technology. This can entail technological and digital innovation for open and transparent government. Also, it may well be a tool contributing to a plural economy that promotes social and environmental transformation and citizen empowerment.

Open data in combination with *open source* and *open standards* does not only bring the advantage of easy implementations of already established products, services or systems by other administrations (fostering local IT industry). It also provides transparency and could encourage a new work culture of openness and collaboration with local groups. This can be challenging but also groundbreaking for the local scene, across city borders and administrative units. Additionally, a cultural change towards experimenting, trial and error can attract future employees with much needed excellent IT-education.

Sarajevo has to find its own approach to urgent needs of local citizens. Next to obvious priorities like air quality workshop attendees identified garbage collection, parking spots and traffic/mobility issues as hot topics. Implementation of projects in these areas might – in case of a smaller scope - be quicker with more visible results that are relevant for the people in Sarajevo.

A key element is that initiatives are supported by all relevant bodies, canton, city and the surrounding district municipalities to guarantee the success. From our experience a combined approach inviting local potentials to work together for their own city could add to an inclusive vision that brings Sarajevo forward. With regards to proper storytelling there are also historical references available: “In 1885, Sarajevo was the first city in Europe and the second city in the world to run a full-time electric tram network.”

A more detailed summary of the discussion can be found in the appendix (see below). Recommendations for Sarajevo based on experiences in Vienna are as follows:

- Focus on the long run with open data (“open data by default” principle)
- Transition and use of free software
- Interoperability of services and systems through the use of free standards
- Designing public services as “digital services by default”
- Placing citizens at the centre of the design process
- Contributing to public value
- Creating a trial & error culture within the administration where feasible
- Implement low-hanging-fruit type of projects to create a profile and visibility
- Learn, copy & paste from leading cities
- Apply network thinking, join and create partnerships for implementations, internationally and locally

4_ The Vienna Cases

Framework Strategy Development in Vienna

The City of Vienna took a different approach with a similar set of players being engaged at the beginning of its Smart City process in 2011. With a lack of clearly visible needs to justify Smart City activities, Viennese stakeholders invested a significant amount of time to analyse many details and drafted a holistic document. The good intention to address every aspect of urban life led also to time consuming discussions. Consequently, it was a challenge to agree on a compelling but limited set of metagoals. In hindsight, one could argue that Vienna wanted too much in the beginning with dynamic contexts urging Vienna to adapt its Smart City Framework anyway. 2014, Vienna's Smart City Framework Strategy was finally adopted by the Vienna City Council as legislative body in charge.

Vienna's Smart City Governance

In Vienna, Smart City stakeholders agreed on a governance and monitoring system mandating executive competence mainly to administrative levels. Smart City Vienna's governance approach mainly focuses on operations as three of four management formats were set up as follows:

- *A High level steering group* led by the CEO of the Vienna City Administration meeting 4 times a year involving the highest public officials and managing directors of public utility companies and city owned businesses. The group is supported by an multidisciplinary international expert advisory board. Its main focus is put on strategic decision making on programs, methodologies, target conflicts and synergies etc.
- *A Smart City task force* led by the municipal planning director and supported by department leaders in charge of sectoral budget administration with a focus on program and project implementation. Executives with different educational backgrounds - engineers, urban planners, economists, sociologists etc. form this working group. Their main goal is to use regular budgets and align schedules coherently as well as to prepare the steering group's decision making.
- *Political executives representing city government members / city councillors* are coordinated by the municipal planning director accordingly.
- *A Memorandum of Understanding with Federal Ministry of Innovation* (MoU) facilitates a collaborative platform extending Vienna's Smart City approach beyond municipal boundaries. Its main goal is to tackle problems and challenges that exceed municipal areas of competence (e.g. design of national funding schemes, regional strategies in the field of traffic flow management etc.). Led by the municipal planning director experts from the City of Vienna cooperate with senior officials from the federal level. The MoU format is supported by three specialized sub-working groups (energy, mobility, IT) at the operational level.

- *Urban Innovation Vienna_Smart City Agency* is supposed to be an agile, neutral information and innovation broker in charge of governance coordination. As „yes team“ the Smart City Agency sets agendas and organizes meetings, special content contributions, documentation and dissemination etc. Its neutrality is supposed to level the playing field for all participants minimizing self-defeating stigmata of organizational silos within the system. The team is also expected to initiate pilots, create consortia for funding calls as well as to screen needs, trends and initiatives with special regards to operating efficiency and synergy effects.

Digital.City Vienna

DigitalCity.Wien¹³ was officially launched in September 2014 – a joint initiative lead by local IT businesses and the Vienna City Administration. The main goal was to contribute to Vienna’s development into one of Europe’s leading digital hotspots. The initiative initially addressed a shortage of skilled IT professionals and expanded into a much broader *collaborative platform* subsequently. A mission statement evolved over time into a comprehensive program paving the way for a variety projects.

In February 2015, DigitalCity.Wien legally registered as an “association” according to Austrian law. In cooperation with the Vienna City Administration and city owned agencies successful communication channels and formats were established succesively. For instance, “Digital Days” is now the annual highlight-event of the local IT community attracting more than 4.000 people. It was essential to establish trustworthy relations by using a “*neutral frontend*” sending the right signals to the IT community. Even though city representatives have been eager to invite local private companies and societal stakeholders it remains crucial that the municipality stays in the background establishing a neutral/levelled playing field and bypassing complicated administrations at the same time.

DigitalCity.Wien emerged due to a lack of applicable frameworks and started with awareness campaigns using claims such as „we love IT“, „we are a community“, „we see the world changing“ and „we need new answers“. Often, civil servants as well as specialists from Viennese IT companies act as *volunteers*. Consequently, the platform is still running without a big budget but with a minimum amount of lean coordination.

Large Scale Project Management in Vienna

The more complex projects become the more urgent is the need for specialized entities in charge of project management. *Wien 3420 aspern development AG*’s collaboration with the City of Vienna is one example for an external project management unit structured as a unique public-private-partnership. As PLC it is developing a project which will provide homes for over 20,000

¹³ Cf. <https://digitalcity.wien/>

people and almost as many workplaces. Together with multiple partners from the public and the private sectors Wien 3420 aspern development AG coordinates all urban planning activities within a 240 hectare development area – in close cooperation with the City of Vienna. Most importantly, it manages the economic utilization of building plots. An interdisciplinary staff acts as a partner for investors, project developers and companies as well as for numerous municipal experts in order to ensure sustainable, efficient and thus cost-effective construction.¹⁴

Smarter Together in Vienna

Within Smart City Vienna projects like *Smarter Together*¹⁵ are used not only for the purpose of research and feasibility studies. Even more so, participatory formats are significant means for disseminating knowledge and raising awareness. Smarter Together is an urban renewal initiative, co-funded by the EU and implemented in the three cities of Vienna, Lyon and Munich. Together with local residents and companies Smart City solutions have been developed. The focus was put on building renovation, energy, mobility and logistics and related ICT technology.

In the course of the project measures for a smarter district are developed together with residents, local institutions and companies. Throughout the 5-year-project period participation is possible on many levels, with multiple formats and events inviting willing citizens to get involved and co-create:

- Initiate activities in the project area with local partners such as the community college Simmering
- Create ownership by actively involving residents in mobility and renovation projects.
- Offer numerous information services such as energy awareness training for tenants

Smart City Vienna Communications

Smart City Vienna has been always been reluctant to promote its overall strategy together with industrial sponsors. Instead, flexible project-based collaborations with the private sector is at the heart of a value-oriented, project-based¹⁶ (at times inbound-marketing) approach with Smart City Vienna clearly not pursuing commercial interests in its own right. For instance, *unusual formats* like the Flashmob Digital.City¹⁷ Wien or KRANENSEE¹⁸ in aspern Seestadt were used to

¹⁴ Cf. https://www.aspern-seestadt.at/en/business_hub/innovation_quality/quality_management

¹⁵ See online under <https://www.smartertogether.at/>

¹⁶ Mission Statements do refer to concrete measures and goals, so that they can be used to provide basic information and orientation at a project level. For instance, see online under <https://digitalcity.wien/mission-statement-3/>

¹⁷ In order to communicate the importance of the local IT industry as a part of the Smart City Vienna to the general public as well as to political decision makers an "I like IT" action day took place in September 2014. At the same day DigitalCity.Wien was launched with support of numerous local IT companies. Around 2,000 executives drew considerable attention complying with a collective dress code of yellow "I like IT" shirts on Vienna's streets.

¹⁸ On February 15, 2014, KRANENSEE - a ballet of cranes - took place in aspern Seestadt – a large-scale urban development area in Vienna's Northeast. 42 tower cranes and a concrete pump were equipped with different-colored lamps to perform

communicate topics that are relatively difficult to conceive (construction works, IT industry) for general interest audiences. Both events were creative collaborative solutions developed by multiple partners from the public and the private sector. Those formats were implemented at low cost relative to their PR impact.

visual effects to originally composed orchestral music with 15 crane operators turning the booms in line with the music. The main goal was to make people more aware of the city's development. See online under <https://www.wien.gv.at/video/246650/Kranensee-in-der-Seestadt-Aspern>

5 Staying on Target – Next Steps

From our point of view Sarajevo needs to focus on building a consensus on its vision framework by telling a positive story about the future of the Bosnian capital. However, those efforts have to be backed up with concrete projects addressing the most pressing needs and drawing on the strengths of the city and its people as soon as possible.

Given that a common understanding of *Smart Sarajevo 2030* is established, Urban Innovation Vienna would be eager to serve as a reliable partner providing further support in the field of project development. Depending on tasks and specific challenges to address, Urban Innovation Vienna could also facilitate collaborations with third (international) parties providing additional expertise. From UIVs point of view a) an Assessment of the status Quo and the development of *Smart City Monitoring concept*, b) development of an *Urban Data Architecture Blueprint* within a research project with international partners or c) *Urban Mobility Scenario Planning* for the compact City of Sarajevo could be viable areas to collaborate.

The *Exploitation of geothermal energy* could have multiple positive effects for Sarajevo, especially in conjunction with the extension of its district heating networks (improvement of air quality etc.). With promising geothermal zones in proximity to the city potentials and realistic use cases should be identified and precisely assessed.¹⁹ UIV would recommend to build up an expert consortia/sounding board to support further research and project development in the field.

Innovation Marketing and Smart City Communications are also interesting topics to further address. However, we would recommend to develop concrete projects to test support as well as services and communication and marketing campaigns in everyday life. However, regarding the presumable scale and scope of contemplable collaborative projects and due to formal requirements it is unlikely that the BACID programme will be an option to co-finance future cooperation between the City of Sarajevo and UIV.

Disclaimer

Experiences and information shared are historical often referring to the ongoing Smart City process in Vienna, Austria. As past performance is not a reliable indicator of future results and local stakeholders may not recover the full amount of benefits if uncritically applied in the local context it is important to explicitly indicate that simple imitation or replication of projects, processes, means, formats and respective alignment of resources will not lead to sufficient yields and satisfying outcomes in Sarajevo. Instead, due to distinct status and idiosyncratic contexts such an approach implies a high risk of failure in all likelihood! In order to succeed, each city has to

¹⁹ Miošić Neven, Samardžić Natalija, Hrvatović Hazim (2015): The Current Status of Geothermal Energy Research and Use in Bosnia and Herzegovina and Miošić Neven, Samardžić Natalija, Hrvatović Hazim (2013): Hydrogeothermal convective systems of Ilidza area near Sarajevo, see online under <http://www.geothermal-energy.org/pdf/IGStandard/WGC/2010/0133.pdf> and <https://pangea.stanford.edu/ERE/pdf/IGStandard/SGW/2013/Miosic.pdf>

develop and adjust its very own strategy as well as distinct capacities addressing local challenges appropriately. An exchange of best practices and sharing knowledge will also require adaption to facilitate effective processes as well as to minimize costs.

Appendix (Protocol of the Value of Open Data Session)

Physical and digital infrastructure are a playing field for all sorts of societal players and Smart City stakeholders (science, businesses, tech and service providers, civil society). It is important to understand that an urban data infrastructure has to be set up in the long term with its basic digital architecture being developed, managed and controlled by the city. Avoidance of fragmentary and volatile infrastructures at the basic level is highly recommendable as its architecture will impact a city's future significantly - just as physical infrastructures like water supply, transport networks, electricity grids etc. do. Empowered cities should own their foundations – technically, knowledge and property wise. In this case, application layers can be built on top of it. But digital infrastructure and services are useless if they do not fit with a city administration's operating system in the real world. In the latter case inputs made via apps and data driven insights cannot be processed properly.

FLASHBACK DATA MANAGEMENT: Vienna & Lower Austria: The “data buck” doesn't stop at the administrative zone/border towards Lower Austria (i.e. transportation/commuting etc.).

Compatibility with the real world operations of a community implies that services have to be manageable. In case of limited resources a staged approach is considerable since the beauty of apps like Sags Wien is that a city can use the system to analyse data and prioritize issues at the backend. Information does not get lost and administrators can handle the process better if they know how a city works in the real world. New tools like that often entail a loss of control a city administration used to have in the past. If thousands of submissions and complaints come in within a short span of time public servants have to learn to deal with transparency and criticism from outside. Therefore, efficient processing of the task and a new approach in communication are required.

If this is done in a smart way cities have the opportunity to lay the foundation for a new culture. With representatives from Sarajevo reporting that people are not commenting und submitting issues to the city (water leakage etc.) such a neglect indicates a lack of trust. But new technologies can be used to distribute callers and submissions to appropriate departments and districts as well as for priority assessment. Since a small hole in the pavement is not as urgent as a broken street light or a pending electricity problem, management tactics can be adjusted. The better you can classify the more efficient is the process in the real world. AI based predictive analytics have the same potential in areas like transportation, banking, mobility etc.

Regarding the likes of Sarajevo a staged approach is most suitable. A single service that is manageable and fits with the resources of public administrations can be a good start. If the value proposition holds it helps to accumulate trust over time and services can be extended step by step. Smart City is complex but most people understand that fixing a street or building a house takes more time than developing a new software app. As priority assessment supported by AI addresses the need for expectations management new options arise to keep motivation levels high. By adjusting communications with a focus on credibility and transparency trust can be built. Sometimes people are already satisfied if they get a credible explanation that a city is aware of a certain problem and is attempting to fix it. Certain fall out rates are to be expected anyway.

Additionally, multiple other options for collaborations will open up in case of a sound digital infrastructure set-up (e.g. infrastructure as a playing field in exchange for data sharing, service commitments in specific) in the right way: However, establishing open standards, open data and creative commons licences, on top of which applications can be built on demand, is a promising path to take. Usually most cities deal with typical legacy problems of different systems of the past. In the long run, one basic system / digital infrastructure should be in place. This could be a big opportunity for Sarajevo. The City could start at a higher level of an integrated system with very few infrastructures existing. Consequently, the city has to deal with less perceived or factual switching cost of certain departments and organizational silos that have invested in distinct but separate systems in the past.

Open standards do allow the utilization of best practices in the field of digitization which implies lowering costs for second movers. For instance, the transportation system of Helsinki²⁰ runs on the principles of open source code and open data. Cities can customize it /adapt it to their needs since it is assumed to cause lower operating costs than several proprietary systems. Bus.meran.eu²¹ was developed for only 15.000 EUROS relying on open data, open standards, open source. It is available free of charge. It can be adapted to every city's needs. Someone else did research & development bearing the main costs. There will be low adaption costs in comparison with the outlay necessary to develop or purchase a proprietary system. The City of Amsterdam is also committed to open source and open data²² in the domain of AI and other technologies. Everything they produce will be open source.

FLASHBACK: On crucial element of Open Data in Vienna was the OGD platform (open-government-data²³). As to date, 37 meetings have been held to open up the administration to civil society, scientific and business community in that domain. The events itself are straightforward: 1 hour of official presentation followed by informal networking sessions to create personal relations.

²⁰ Cf. <https://www.globenewswire.com/news-release/2017/04/13/1301609/0/en/Helsinki-Metropolitan-Transportation-Authority-s-New-Journey-Planner-Showcases-Open-Source-Software-Development.html>

²¹ Cf. <https://bus.meran.eu/>

²² Cf. <https://amsterdam.github.io/>

²³ Cf. <https://digitales.wien.gv.at/site/open-data/#newslider1>

Open Data Charta and Declaration of Cities Coalition for Digital Rights:²⁴ Sarajevo can basically go there and join in, use the content and learn from the authors. Manifesto for technological sovereignty and digital rights²⁵ promoted by leading Smart City Barcelona is another example. It is possible to download it. Local experts can read it and adapt it to Sarajevo's needs. Moreover, one can share the burden with others. Open standards also imply (local) business opportunities as standards need to be understood and improved. As feedback goes back into the system, nice scalability effects are possible.

Currently a lot of cities are dealing with E-Scooter issues in the innercities. However, E-scooters would be needed in Vienna's suburbs. An agreement is recommendable that service providers have to provide their data for analytics. Also, it should be mandated that part of their services are provided to periphery/suburban areas. Requiring open data and open source technology is one of the biggest leverages a city can establish.

Contrary to physical infrastructure, it is not a big issue if a server goes down as long you have a sound back up system. One can use digital infrastructures to experiment a lot more as it is used to be the case in the physical world with expenses and/or sunk costs often being negligible. Consequently, a city or community does not need to develop a perfect strategy for multiple years in order to justify the risks to be taken. With a tremendous amount of uncertainty accompanying the Smart City transformation options of trial and error should be highly appreciated. Via experimentation and a higher amount of tasks and projects managed inhouse, cities will also accumulate valuable know-how that will enable them to negotiate suitable contracts with private technology and service providers and developers (innovative procurement).

FLASHBACK: Smart City Vienna is eager to experience new technologies like blockchain to identify use cases and business cases. Vienna's energy utility company is actively testing blockchain technology for decentralized, uncomplicated handling of transactions in the energy industry. At the beginning of 2017, a pilot project for gas trading was carried out together with oil companies BP and Eni, business consultant Ernst & Young and blockchain start-up BTL.²⁶ Trial and error also implies that (communal) project managers have to be confident enough as they could feel the heat of citizens. But if an error culture is developed incrementally over time, riskier projects and preventive innovations could become more realistic to implement. At best, a Smart City process is accelerated. At worst, a team experiences a new technology and learns for the next project.

Smart City experimentation can also be done at low cost: Regarding air quality issues measures as used on Luftdaten.info²⁷ or similar projects are promising means to draw attention, create awareness and implement small projects and campaigns. With affordable sensors for 35 Euros a

²⁴ Cf. <https://citiesfordigitalrights.org/>

²⁵ Cf. <https://19.re-publica.com/de/session/manifesto-technological-sovereignty-digital-rights-cities>

²⁶ Cf. <https://smartcity.wien.gv.at/site/en/blockchain-in-the-energy-sector/>

²⁷ Cf. <https://luftdaten.info/>

full fledged air quality measurement center, even though not scientifically accurate, can be distributed to facilitate participatory projects with residents. The technology is sufficient to put data on a map for monitoring purposes and initiating public discourse about measures that could be taken at the demand side (changing citizen/consumer behaviour). The City of Stuttgart is used to air pollution issues in the winter too. With 5.000 sensors generating and transmitting data on a platform at least young people are likely to play around and learn. This equipment can be used for educational programs too (the next generation of public servants).

Regarding the leverage of owning network infrastructures, LoRAWAN²⁸ for low data traffic volumes applicable for a range of IoT sensors (temperature etc.) is another low cost option with base stations available for approx. 800 Euros. 10 stations around the city could well be sufficient for Sarajevo to own a sensor network that can be rent out to a variety of users. If the city does it via utility providers - only power supply and internet connection are required - LoRAWAN is low cost easy to maintain basic infrastructure. 10.000 sensors to be served. It would be unwise to let other players capture all the network effects. Being the first supplier of network infrastructure and interactive innovations often creates significant switching costs for users determining further investments (cf. telecommunications). A set up should be thoroughly designed with foresight. The better, the more control municipalities will have in the digital era. As with all technologies, digital infrastructures should serve the citizen!

²⁸ Cf. <https://lora-alliance.org/about-lora-alliance>