#### The European Commission's **INTELLIGENT CITIES** CHALLENGE

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**Muncipality of Idrija: Intelligent City** 

#### **Executive summary**

#### Two transformations of Idrija

To understand the post-mining development of Idrija, we must distinguish between two processes: the transformation from mining to industry and ongoing transformation from industrial production to smart/digital economy. The first process started already in the 1960s, when the government established several electro-industry workshops in order to empower women by including them into the labour force and giving them a chance to become independent of their husbands. These workshops proved to be very successful and benefited greatly from the know-how of technicians, previously employed by the mine and later increasingly moving to industry. Moreover, a work ethic of Idrija contributed to the success of the industry as Idrijans were diligent and had always strived for the best result. Electro-industry companies gradually concentrated in two large multinational corporations and diversified in automotive industry, construction engineering and electric power industry. Despite global production system, management and research are still heavily present in Idrija, making Idrija one of the most economically advanced municipalities in Slovenia.

Yet, it is Idrijan perseverance and pursuit of excellence that drives the Municipality of Idrija to search for new models of development to address the rising challenges of the 21st Century: demographic decline, aging population, mono-structural employment opportunities, upcoming shift into quaternary sector and subsequent decline of production jobs, increasing social vulnerability of some social strata and rising importance of clean and protected natural resources. To tackle these, the Municipality of Idrija has adopted several strategies, with Innovative Strategy of Sustainable Development of 2011 as the overarching vision for the future development towards a modern smart city, capable to answer all challenges of the new digital era.



#### **Mayor Foreword**

Tomaž Vencelj, the Mayor of Municipality of Idrija

"Society grows great when old men plant trees whose shade they know they shall never sit in," goes a Greek proverb. Just like fourty-years ago Idrijans opted for a future that we live today, we are now shaping the future of Idrija that will be lived by the future generations. In the times of rapid global changes and technology innovations this means we must be courageous and sharp, be prepared and willing to change, to accept and implement new concepts of doing things and above all, to remain solidary.

Like we always were.



## The municipality of Idrija pursued an EU-supported transformation over four main stages, and this document details that journey by these sections

Overview to the city's journey and structure of this document

CHALLENGE

				Reported as one section
	Preparation & assessment 5 months: September 2020 – January 2021	2 Ambition & roadmap 3 months: February 2021 – April 2021	3 Implementation 15 months May 2021 – July 2022	A Review & way forward 2 months August 2022 – September 2022
Summary	<ul> <li>Idrija's key focus areas:</li> <li>E-governments and e-services with focus on open data;</li> <li>Open solutions support for: tourism, mobility, energy management, and environment;</li> <li>Better data flow between local government and citizens;</li> <li>Standardisation, data merging, transparency, and safety;</li> <li>Establish data transparency and connectivity by accepting common standards for open data.</li> </ul>	<ul> <li>Data collection</li> <li>Data cleaning, preparation and management</li> <li>Data analysis</li> </ul>	<ul> <li>Data collection</li> <li>Data cleaning, preparation and management</li> <li>Data analysis</li> <li>Software installing and setting</li> <li>Transfer test data to database server</li> <li>Tweaking and security settings</li> <li>Choose and install software for visualization of data</li> </ul>	The municipality reviewed different approaches to ongoing activities pertaining to data nad software that would allow data to be fully explored.
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Section

September 2020 to January 2021



# Municipality of Idrija: Preparation and assessment

ICC transformation



#### Introduction

Throughout history, Idrija went through several development cycles – all of them somehow connected to technological innovations. Since the discovery of mercury in 1490, and later use of water power in mining processes, introduction of steam machines and electrification, Idrija's Mercury mine was one of the most advanced mines in Europe. With the decline of the mine's activities, Idrija's economy restructured into focusing on electro and automotive industry and found again its competitive advantage. We understand that adapting to changes in economic, social and technological environment is eminent and thus we are always searching for new innovative ways to deal with challenges.

From the information society we are moving into smart and digital era, where digitalization, automatization and artificial intelligence will redefine social, economic, technologic and political foundations of our societies. Joining the ICC cities, the Municipality of Idrija has an opportunity to embark on new developments and tackle its (digital) challenges from a strategic perspective.

Since there are also two other consortiums (Association of Municipalities and Towns of Slovenia - SOS) consortium and consortium of City Municipalities - AUMS) participating in ICC, with similar overlaping needs and challenges regarding digitalization, we jointly decided to pursue our efforts in close cooperation, so that we can capitalise on our synergies if possible.

This chapter presents the state of Idrija's strategy development process for achieving the common goal for utilisation of common open data principles.



## City needs: State of the city overview

#### The state of Idrija today

The city administration still provides most of the services in the old-fashioned way with most information only available onsite or online.

The city is planning to expand its e-services offering, which is conditioned with elevating digital competency of the public servants responsible for digitalisation

We plan to determine, which form of data base would be the best for city needs. Database should satisfy OASC recommendations, be resilient enough for sustain our future needs, should enable interchange mechanisms, be safe, secure and should enable serving information for increasing number of users without increasing costs in licence fees. Open source would be preferable. Based on this database a server will be configured and this will be a digital platform for our data lake.

All existing systems will be checked for interoperability possibilities. Where possible, data from such projects will be included into the data lake. Future procurements will include a clause that data connectivity with our data system is mandatory. At the same time the responsible personnel for managing the data lake will receive the necessary training to maintain basic functionallities of the data lake. For security reasons the core maintenance of data lake will be outsourced to trained professionals

#### Key insights from city performance analysis

Higher performance observed	Lower performance observed		
1 Most of the city is covered by 3G / 4G networks.	1 The municipality currently has no smart infrastructure.		
2 Free Wi-Fi is available in enclosed public areas; such as libraries and shopping malls.	2 Public sector institutions and organizations do not share their data.		
3 Citizens generally trust government/municipality data privacy, security and ethics.	3 Open data is not used for policy making.		
4 Various initiatives have been taken by citizens, but so far to a limited extent.	4 Threre are no accepted standards for data exchange between municipal stakeholders or between municipalities.		
5 Where possible, citizens are actively involved in municipal decision-making processes.	5 Citizens do not get what they need easily from public processes.		



## Idrija's needs assessment: Digital conectivity

#### 2.1 Wireless internet access: How advanced is mobile internet coverage in the city?

- The municipality is partially covered by 3G / 4G networks. 9%
- Most of the city is covered by 3G / 4G networks. 91%
- Most of the city is covered by the 5G network. 0%

2.2 Wireless internet access in public areas : What is the availability of free wireless internet in public areas?

- Free or very limited availability of free Wi-Fi in public areas. 5%
- Free Wi-Fi is available in enclosed public areas; such as libraries and shopping malls. 41%
- Free Wi-Fi is available in public areas; such as parks and town squares. 55%

**2.3 Availability of information / services:** Do citizens expect access to information, services and interactions digitally / online 24 hours a day, 7 days a week?

- Mostly not. 23%
- Yes, but only to certain essential services / information. 41%
- Mostly yes. 36%

**2.4 Smart infrastructure:** What is the coverage of the city with smart infrastructure (public lighting, roads, energy, waste management, smart buildings)?

- The municipality is only partially covered by smart infrastructure. 95%
- A significant part of the city is covered by smart infrastructure. 5%
- Most of the city is covered by smart infrastructure. 0%

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Legend: Percentages correspond to the proportion of answers. The underlined answers are from Idrija.



## Idrija's needs assessment: Open data

**3.1 Contribution to open data:** Do public sector institutions and organizations share their data?

- No, little or no open data is available. 74%
- Open data (housing, mobility, energy, socio-demographic data...) are available, but there is no real-time data and no APIs. 22%

• Yes, open data is often available in real time with the API. 4% **3.2 Use of open data:** Is open data used for policy making?

- Without the use of open data in policy making. 61%
- Limited use of open data in policy making. 30%
- Extensive use of open data in policy making. 9%

**3.3 Data sharing:** Is there a standard for data exchange between municipal stakeholders?

- Mostly not. 52%
- To some point. 48%
- Mostly yes. 0

**3.4 Benchmarking**: Is there a standard for data exchange between municipalities?

- Mostly not. 65%
- To some point. 26%
- Mostly yes. 9%

**3.5 Data congestion**: Is it difficult to set priority issues and establish an effective dialogue with citizens and businesses due to data overload (across different channels)?

- Mostly not. 35%
- This is not a problem yet, but it will be 45% soon.
- Mostly yes. 20%

**3.6 Security:** Do citizens generally trust data privacy, security and ethics?

- Mostly not. 17%
- <u>Under certain conditions. 52%</u>
- Mostly yes. 30%



## Idrija's needs assessment: Citizen Participation

4.1 Public procurement: Do municipal procurement involve the procurement of innovative solutions (JNI)?

- Without the use of public procurement of innovative services. 76%
- Public procurement of innovative solutions considered, but used only in a few cases. 29%
- Yes, regular use of innovative solutions. 5%
- 4.2 Public participation in policy-making: Are citizens actively taking new initiatives?
- No or only few stand-alone initiatives were taken. 23%
- Various initiatives have been taken, but to a limited extent. 73%
- Initiatives are frequent and / or fast growing. 5%

**4.3 Public participation in policy-making:** Are citizens actively involved in municipal decision-making processes (participatory budgeting, citizen participation in city council meetings ...)?

- Without or rarely citizen participation. 14%
- <u>Some citizen participation. 64%</u>
- Active participation of citizens. 23%

4.4 Citizens' experiences: Do citizens simply get what they need from public processes?

- <u>Mostly not. 19%</u>
- Yes, but only from certain processes. 48%
- Mostly yes. 33%



#### Municipality of Idrija's Ecosystem

• GRAZ

ZAGREB

#### Idrija

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- Middle-size municipality in Slovenia
- The oldest Slovenian mine town
- Number of population: 12.000
- One of developmentally most perceptive municipalities

#### Municipalitiy ecosystem stakeholders

- Other municipalities
- Three ICC projects in Slovenia
- Government: ministries in charge for open data
- Companies and education
- EU Cities best use cases and best practices
- Expert groups for open data



& Education

MUNICIPALITIES URBAN MUNICIPALITIES INCLUDING CITIZENS



### Idrija's ecosystem: Who are the stakeholders?

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Open data often blurs the line between different stakeholders. In some circumstances, <u>private sector</u> and <u>civil</u> <u>society organizations</u> can compete to provide the same services, and the research area often involves overlapping networks of academics, civil society organizations and donors. Open data contributes to blurring the boundaries between different stakeholder groups, therefore there is a need for a good understanding of the relationship between the <u>state</u>, <u>civil</u> <u>society</u>, <u>private</u> <u>sector</u> <u>and</u> <u>citizens</u>. For example, when data is open, applications previously made by governments can be redirected to the private sector or e.g. the work of journalists is carried out by part of civil society. When we look at different stakeholder groups, we need to pay as much attention to their interpersonal relationships as to their roles.

The key stakeholders are <u>municipalities</u>, which are also the owners, and possibly also users, of a considerable amount of data. In addition, it should be understood that access to data can also provide strong support for the development of new small businesses (private sector), which can also have a positive effect on citizens. Of course, the development of solutions depends on <u>other ICC projects</u> we work with, as well as on the conditions of access to financial resources - in this case, the Ministry of Public Administration published a call for demonstration projects for establishing smart cities and communities "JR PMIS," (https://www.gov.si/zbirke/javne-objave/javni-razpis-za-demonstracijske-projekte-vzpostavljanja-pametnih-mest-in-skupnosti-jr-pmis/), which will also affect the development of ICC, and our, projects.

#### Idrija's ecosystem: Transformation into digital era



## Idrija's ecosystem: Many awards and completed projects



## Idrija's ecosystem: Main stakeholders



- Employees in municipal administrations
- Citizens, public services

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• ICT departments in municipalities that will be able to follow successful practices and implement them

#### **ICC strategy: Vision and ambition statements**

Being a small municipality, Idrija have an advantage to be flexible and responsive to innovations and development. Although it is not equipped with enough resources and budget for making a huge research breakthroughs, it is very capable and determined to implement new solutions into day to day activities. The path to the future is clear: to stay or become modern, developed, green, social and friendly municipality. To achieve this goals in the field of ICT we'll focus on some specific areas.

- Harvesting information
- Filter and clean raw data
- Publish data in right database

- Establish data services
  - Configure user database
  - Configure access privileges

- Find and establish a municipality software platform
- Preferred are open-source solutions
- Platform connects datalake with many different services
- Third party solutions can be part of platforms functionalities
- Keep communication with business organisations, educational organisations other municipalities and civil initiatives
- Merge data with existent services
- Keep finding new potential datasources

- With AI and analytical tools transfer data into information and knowledge
- Use this knowledge for better decision making





#### **City strategy: justification**

- The municipality of Idrija aims to develop a data lake, with the potential to interact with solutions
  prepared by other cities/municipalities (expected development of a data platform by Ljubljana) and
  foster positive synergies that reinforce the success of one another (data lake being analysed on the
  platform, and the platform becoming an essential common point also for other municipalities in
  Slovenia).
- A potential conflicting interaction could occour if the platform is built with inadequate standards for open data. To avoid such a result the municipality of Idrija is in close contact with Ljubljana and collaborating on the development. In case the municipality of Idrija will need to find an alternative solution, it might potentially need to develop its own platform.





#### **City strategy: justification**

#### Three guiding thoughts:

- Our citizens deserve better services.
- Our municipality should be better informed to make the right decisions.
- Digital is here and we needs to be taken advantage of.

#### Key factors that define success of our solution:

- Political understanding and financial support.
- Municipality employee training and support for change.
- Citizens' support for digital solutions.



#### **City strategy: justification**

#### Standardization and aggregation of data:

- 1. We intend to determine which form of database would be best for the needs of the municipality. The database must meet OASC recommendations, be flexible enough to meet our future needs, allow messaging, be secure, and allow information to be delivered to a larger number of users without increasing licencing costs. Open-source software would be desirable.
- 2. Based on this database, a server will be configured, and this will be the digital platform for our data lake. All existing systems will be checked for interoperability. Where possible, data from these projects will be included in the data lake.
- 3. Future procurements will include a clause that data connectivity with our data system is mandatory. At the same time, the data lake management staff responsible will receive the necessary training to maintain the basic functions of the data lake.
- 4. For safety reasons, basic maintenance of the data lake will be performed by qualified professionals



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Section

2

February 2021 to May 2021



# Municipality of Idrija: Ambition and roadmap

ICC Transformation



#### High level tentative implementation roadmap ("10000m plan")



#### Rationale to road map

- This roadmap represents the plans of Municipality of Idrija to continue with the **development** of digitalized services, **enhance** data usage with **benefits** for local public administration as well as for our citizens.
- Main focus of our activities is to establish **database foundation** for different types of incoming data. This includes research and cooperation with other stakeholders (University, Development center etc).
- With basic standards defined, a testing facilities for **data lake** will be installed. Its purpose will be to test and experiment with different scenarios for database management and especially will help to educate chosen municipality personnel to achieve basic data management skills.
- One of the activities will be to check the city's digital **infrastructure and services** and through implemented interoperability mechanisms try to interconnect their data and make relevant information available to the public and other interested parties.



#### Rationale to road map

- Since the start of the project, we had to change some goals with initiative 2 and 3. Data server was successfully installed and data published. To integrate data from services APIs should be installed therefore we need developers to write them. Consequently, this part of the project was postponed.
- GDPR demands is clearly defined in our national legislation, so any data which potentially includes personal information is screen-filtered and compared with requirements.
- The list of requirements for further implementation of data is not yet finished. The basic and most important requirements are known, still, the list will probably remain a work in progress and open to additions and minor changes.
- Publishing of the data, as final part of initiative 3, was omitted at this time. It is unpractical to publish the database in the form of tables or in raw form. We are waiting for the software platform to be installed, which will present the data information through specialized modules on the platform, also taking care of user logging and data presentation and visualization.



## **Initiative charter**

Strategy		Stakeholders inv	olved	Inputs, outputs	s, outcomes and impacts
	What: Digital data lake initiative #1 Why: Review what kind of data we already have and what kind of data need to be managed	Solution lead:	Tadej Rupnik	Source of funding and estimated	The source of funding is Municipalities budget and an estimate of the cost in first phase is the cost of the starting set of database server about 2000€
	How: Querying the comparable municipalities, observing workflow of the coworkers, check out the accounting department, collect information of the working services	Solution working team:	Tadej Rupnik	Solution	The solution is not reach the phase to be
Link to vision	Digital data lake as a technological foundation for keeping, reusing, distributing and otherwise managing data.	Contributors:	All municipality coworkers, contacts from other Cities	maturity outputs $\left[ \begin{array}{c} \bullet \\ + \bullet \end{array} \right]$	and testing is still needed on the project
Link to ambition statement	Information to be available for the segments where until now they were not and to be more manageable and controlled.	Risks and mitigation	Not to recognize all important data as data source, not to be able to sufficiently protect the data lake, stability and availability issues	City performance	As the data lake is not yet activated for general use, the results are not available.
Expected impact and timing	Information will be more prompt, accurate, and available to wider clusters of potential users The solution will begin to create impact	The challenges would be to choose the correct hardware and software, to engage personel for data updates, inadequate competences of involved people		outcomes and impacts	1
The European Commission's INTELLIGENT CITIES CHALLENGE	after all the initiatives will be implemented. The impact will increase over the time as the stakeholders will gradually get use to it.		What are mitigating measures that are being put in place? Double checking and consultations with experts.		24

#### **Key Performance indicators**

For establishing a database, interconnecting different services and making data available to citizens we have decided on the KPIs presented below:

Solution	Activities – Inputs and actions	Solution Maturity - outputs	City performance – outcomes and impacts
Open data and IT infrastructure management	Funding committed by the city, ecosystem or in partnership with other cities	Share of existing interconnected municipal online services	Number of new municipality online services deleveloped under open data standards
Open data and IT infrastructure management	% of activities completed on time	Amount of municipal online services data and data-based solutions available online	Number of municipalities sharing data
Open data and IT infrastructure management	Number of internal and external subjects contributing to project development	Number of IoT devices (sensors) deployed	Municipality online services data usage (hosting) costs

Each KPI represents a milestone in planned activities, which are mostly interconnected and co-dependent. Performance indicators help to establish true position on given time slice and influence decision making and future steps.



### **Governance structure for roadmap implementation**

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Section

3 + 4

February 2021 to May 2021



## Municipality of Idrija: Impact

ICC Transformation



#### Impact executive summary

During the ICC and lessons learned the Municipality of Idrija had several successes. The most important were not measured against a KPIs, but are rather qualitative. We were mostly pleased to find several stories and challenges similar to ours in other ICC cities, and had also gained their contacts. We reached out to some, while others could prove to be beneficial in the future of our project. Just knowing there is someone that can help you means a lot. In this respect we had also been given access to external topic experts in case we needed them.

Unfortunately we were not able to meet all our ICC objectives, because they were tied to an expected tender from the Ministry of Public Administration to fund digitalisation in the public sector. After several years of waiting for the tender, it was finally open and we applied in a consortium with Ljubljana, who plans do develop a data platform. Unfortunately the tender was revoked, and we find ourselves again in the waiting room. This does not mean that we will not fulfil our promise to our citizens, but it does mean it will take longer.

To continue our progress the Municipality of Idrija is committing itself over the next few years firstly to establish a data lake and secondly to use the data to develop solutions for the municipality and citizens.



#### Assessment of city performance - discussion

#### City performance – outcomes and impacts

To properly address city needs and improve quality of citizen life and create a better environment for municipality employees, we analysed and decided on the presentation, visualisation and use of gathered and produced data through a platform enabled application. This step will be taken once the platform is established, planned in the next 1-2 years.

	.5
Only very limited data is gathered and consequently very small amount of information is available to public.	) solutions in the form of



#### Assessment of solution maturity - discussion

#### Technology maturity – outputs

Idrija is trying to improve city performance by developing new technological solutions (out of ICC project scope), based on gathered publicly available data, which is our ICC project objective. These solutions will be built anew. By engaging with statekolders, receiving their feedback and conducting a study with citizens, we are confident that we will be able to extract much needed added value to the citizens and other stkeholders from the gathered data.

Currently we are focosung on retreiving data available to the municipality, but are also plannning on implementing IoT sensors based on 3G data connections, due to lower costs (potentially 4G data connection. if it will be viable at the time of implementation).

Where we started	Midway through the challenge	Final results
Lots of data available on different media, with different formats, unconnected, and mostly unmaintained.	Arranged sets of data, basic meta data written, data standards accepted, and data server established,	Working database server and visualization softwear installed.
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#### Assessment of city ecosystem and activities - discussion

#### Local enablers – city characteristics, and Activities – actions and inputs

Idrija has a strong history of hard working environment (due to the mine) and a local technical high school, which therefore enabled its unique strengths and weaknesses that help action happen especially in local capabilities and cultural factors that have driven a successful transition to industry in the past and will facilitate the development into a digital socitety tomorrow.

Idrija has taking action by directly appointing a person in charge for leading the digitalisation project and is planning to financially support the procurement of IoT technology in the next two years.

Where we started	Midway through the challenge	Final results
Many services producing data Many internal data sources	Data selected and normalised. Copying data into local database server	Data which is available without special APIs is in local data lake.
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## 5 key lessons

Lesson	Reflections
1	Collaboration is key. Either with citizens, external experts, corporations, or municipality employees.
2	Support is vital. Scarce HR and financial resources present the biggest risk to project comletion.
3	Our citizens are our clients and they support us, which gives meaning to the work we are doing.
4	Together we know more and better. External experiences is welcome.
5	Hard work and motivation pays. There can be very limited efficiency and ulitmately success without personal involvement.



#### **Reflections on city collaborations**

While there were many city presentation during the ICC project, especially on City Labs, the most useful to our case were those cities that presented different solutions to managing open data and additionally the cities that presented the various uses of data to directly or indirectly increase quality of life for citizens.

We were mainly interested in the topics that dealt with:

- managing data platform
- keeping and protecting sensitive data, and
- determination of data administration rights.

Specifically, we were happy to listen to cities such as:

- Heidelberg, Germany for its platform concept,
- Flanders, Netherlands for its Smart Flanders initiative and open data charter,
- Osijek, Croatia on establishing a data hub,
- Porto, Portugal for enhanced access to online services and digitalising administrative service, and
- Phoenix, Arizona (USA) for gathering input from residents to discover how technology can be used to meet their needs.



## Commitments

Commitments to on-going resources	Commitments to on-going collaboration	Commitments to on-going KPIs
The project will be continued with current resources, mainly by Mr. Rupnik External help: Outsourcing – IT security	Idrija will continue its collaboration to all potentilal data providers, in line with project goals and resources. Data providers: corporates, municipalities for data about ecology, environment and energy consumption	The current KPIs will be tracked, and if needed new KPIs will be developed, according to the needs of the municipality, especially for reporting purposes for decision-makers. In parallele to KPIs, also basic and advanced statistics will be prepared to allow progress tracking.



## **3 Year plan - ambitions**

Building on the	Gain all necessary municipality data to help municipality administration better manage its resources.
ICC, what would	Gain essential data from other (comparable if possible) municipalities to allow benchmarking, cross-
will the city aim to	collaboration and searcing for opportunities for optimisation.
achieve in 3 years	Disseminate results to the public and present them to interested municipalities.
time?	Collaboration with OPSI (data sharing) portal at the Ministry of Public Administration.
What steps will you take over the next 3 years to achieve these goals?	Educating and training of data users. Sharing data in accordance to GDPR and needs of use. Establishment of a platform (most probably FiWare) by Ljubljana. Visualisation and manipulation of data. Ongoing monitoring of data with the help of artificial intelligence, integrated into the platform.



## **3 Year plan - targets**

KPI	Category	What commitments will the city make to this end?
1	Funding committed by the city, ecosystem or in partnership with other cities	The funding will be further guaranteed by municipality Idrija. In case of developed platform and implementation of IoT sensors, the funding will be amended/increased appropriately.
2	Share of activities completed on time	Thea rate of success will depend also on external partners as well as available support from decision makers.
3	Number of internal and external subjects contributing to project development	We expect internally for Ljubljana to develop the necessary platform, and externally for 1-3 municipalities and one corporation to help with project development.
4	Number of IoT devices (sensors) deployed	At least 3 sensors for monitoring air quality by mid 2023. By end of 2025 the municipality plans to implement several more sensors for transport, river water levels, consumption of drinking water (in cooperation with utility company Komunala Idrija d. o. o.).
5	Number of municipalities sharing data	By end of 2025 we plan to have around 5-10 cooperating municipalities providing data.



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Appendix



# Municipality of Idrija: Additional information

ICC Transformation



#### What does the solution set out to solve?

Municipality of Idrija is predominantly challenged to providing better quality digital public services to citizens. Therefore, our solution sets out to adress this challenge. For a solution to be developed, we always start with data. And Idrija has a lot of data avilable but does not gather it. So, this is our first, and probably most important task, because it represents the start and foundation for all future activites. To avoid *garbage in-garbage out* effect we must prepare data to be adequate for sharing and utilised for developing citizen-centric colutions. With this we will be able to follow our vision of becoming a modern, developed, green, social and friendly municipality.

#### What are the main features of the solution?

To establish the data lake, several conditions need to be met. We need to keep the municipality support and continuity of leadership on the project. Additionally, many technical solutions and non-technical solutions need to be found (software, hardware, open data standards, models of operations, involvment and cooperation with stakeholders etc.).

The final result should be a data lake of quality and relevant data on a dedicated server, and supported by an appropriate software, according to agreed standards for later to be compatible with the data platform (planned to be developed by Ljubljana) and appropriate for application development and sharing.



#### Why is this the right solution for the city?

As explained on the previous slide, establishing a data lake is fundamental for all future decisions and development of solutions. This is the first step.

#### What is the business model?

Currently the only source of funding is the Municipality of Idrija.

We expected a tender from the Ministry of Public Administration to fund digitalisation in the public sector, which was opened and we applied in a consortium with Ljubljana, who (still) plans do develop a data platform. Unfortunately the tender was revoked, but plans to be open again in the future. But until it is open and realised, we cannot count on additional funding from this source.

In the long term, there is potential to have many funding opportunities, either through finding interested private partners for developing a commercially interesting application, or by finding public partners (most probably other municipalities) for joint development of applications to facititate municipal processes and services for citizens.



#### What are the main blockers and risk and how will the be overcome?

The main risk is not to recognize all important data as data source, not to be able to sufficiently protect the data lake, and technical (stability and availability) issues.

The main blockers or challenges are expected to be to choose the correct hardware and software, to engage personnel for data updates, and inadequate competences of involved people.

The risk mitigating measures being put in place predominantly include double checking of data and with stakeholder, and consultations with experts.

One of the main reasons for the data lake not yet being established is in the limitation of sources of the municipality. There were and still are other more short-term imminent priorities at the municipaliy, that need to be dealt with, which leaves little room for long term development. Most small municipalities in Slovenia do not have their own IT department or a person in charge for (digital) development. While Municipality of Idrija falls into the group of middle-sized municipalities in Slovenia, the digital development is predominantly in the hands of one employee, which also presents its own risk, in case this person would no longer (be able) work on this anymore. Additional recruitment is not planned.



What, at the highest level, are the main stages from today to getting this solution at full impact?

The following are the main life stages:

- Selection of hardware and software technology.
- Selection of data standards and developing protocols.
- Development and testing of data lake data gathering and management (cleaning missings and errors, and manipulation changes in the panel and time series and outliers etc.).
- Educating and training of data users.
- Sharing data in accordance to GDPR and needs of use.
- Visualisation and manipulation of data on a platform.
- Ongoing monitoring of data with the help of artificial intelligence, integrated into the platform.





#### Who is making it happen?

The main proponent of the data lake development is one municipality employee with inputs from coworkers. In the past two years also some contact persons from other cities/municipalities have been partially involved, because they were willing to give advice based on their own experiences, or they saw an opportunity to collaborate on developing a solution they might find beneficial in the future as well.

#### What major uncertainties still need to be investigated?

To facilitate the potential acceleration of our project, the main stakeholder we would need to speak to is the Ministry of Public Administration about the future of the funding of digitalisation in the public sector. If there were an explicit public commitment to the funding deadline, it would strengthen intra-municipal and inter-municipal support and cooperation. And this would then be the second layer of stakelders we would need to communicate with more intensly.





#### How do the solutions interact?

The municipality of Idrija aims to develop one "solution", a data lake, with the potential to interact with solutions prepared by other cities/municipalities, especially with the expected development of a data platform by Ljubljana, which is planned to host applications developed on the data lake. At the same time these two solutions could foster positive synergies that reinforce the success of each other, since the data lake will be analysed on the platform, and the platform will become an essential common point also for other municipalities in Slovenia.

A potential conflicting interaction could occour if the platform is built with inadequate standards for open data. To avoid such a result the municipality of Idrija is in close contact with Ljubljana and collaborating on the development. In case the municipality of Idrija will need to find an alternative solution by collaborating on a platform development by another municipality or it might potentially need to develop its own platform.





If you could boil down your strategy to three thoughts that have best guided you on your way, what would they be?

Three guiding thoughts:

- Our citizens deserve better services. We realise our citizens are our clients. Even more, due to the municipality size and geographic specifics (valley), they are often our families and friends or at least friends of our families and friends. We are connected and feel obliged to improve our lifes and theirs.
- Our municipality should be better informed to make the right decisions. There is always room for improvement, but
  priorities need to be set to tackle improvements efficiently. The municipality has to make many decisions every day
  and some of them are made with limited information, because we do not have data at hand, even though we know it is
  available. We would like to minimise such decision risks and also develop more productive administrative processes by
  partially outsourcing some activites to applications or use applications to organise activities more efficiently.
- Digital is here and we needs to be taken advantage of. The 4th digital revolution has begun years ago and it is not a fad. We have no doubt that digital is here to stay and is becoming increasingly important. It brings opportunities that are currenently viewed as progressive, but due to the speed of technological development, if we do not start utilising technology, our current state of working will be obsolete in a few years.



#### What are the key factors that define success across all of your solutions?

Key factors that define success of our solution:

- Political understanding and financial support. As mentioned, several times in this report, having political support is crucial and fundamental to having HR and financial support.
- Municipality employee training and support for change. There will be no positive outcome if we are successfull at producing applications, but unsuccessfull at training people to use them. To train people we first need to explain our objectives and include them already in the development process, as we are doing. This is how we gain their support for change. If we did not do that, we could expect resistance to change or even revolt. People do not want to use or support something they do not understand, or do not understand the consequences.
- Citizens' support for digital solutions. Similar to municipality employees, also citizens need to be empowered. While we all agree that digitalisation is good on a high level, when it comes to concrete solutions, people can start getting anxious, wary or confused (especially elderly). All of which leads to rejection of solutions. Therefore, we need to manage changes and introduce solutions carefully. And the basis to this is open communication with citizens to gain their support, before solutions are even available.





## Overview of our approach to the development of KPIs to assess city performance and activities

	Idea	What purpose do they serve?	What is it 'a <u>ttache</u> d' to	When do we measure them?	What have we set?
Helps deliver	City performance	How well Idrija is performing on outcomes and impacts (e.g., quality of life)	City programme as a whole	At the end of the project, beyond ICC	Number of new municipality online services developed under open data standards Number of municipalities sharing data Municipality online services data usage
Helps deliver	Solution maturity	How well Idrija is using new technological solutions	Each technological solution	At the end of Implementation, beyond ICC	Share of existing interconnected municipal online services Amount of municipal online services data and data-based solutions available online Number of IoT devices (sensors) deployed
	Activities	How well Idrija is taking action and encouraging others to take action	City programme as a whole	Quarterly, in parallel to development needs	Funding committed by the city, ecosystem or in partnership with other cities Share of activities completed on time Number of internal and external subjects contributing to project development
The European Commission's INTELLIGENT CITIES CHALLENGE					46