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Patras : Intelligent City Transformation Overview

ICC Final Deliverable

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European Commission | The Intelligent Cities Challenge is funded by COSME, the EU programme for Competitiveness of Enterprises and SMEs

PATREUS: PATRas E-city Urban Strategy

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Executive summary

Patras is characterized by a vivid ecosystem of high-tech start-ups combined with very few mid-sized companies in state-of-the art technologies connected to the three HEIs and three highly competent local research centers. Together they have embraced ICC and participate, directly or via representatives, in a Steering Committee formed already in the DCC acting as an informal stakeholders' forum facilitating dialogue and governance for ICC and beyond, i.e. smart city initiatives expected to be funded by the RRF and the 2021-2027 ESIF. The establishment of a project repository (https://patrasmartcity.isi.gr/) to increase awareness of the different efforts at the city level, nurture synergies and avoid duplication of efforts is a helpful tool created on a voluntary basis in the DCC/ICC context.

The vision of Patras is to become a smart digital city with the aim to improve the living conditions of its citizens, professionals and visitors through the active involvement of its human resources, through innovative initiatives by academic and research institutes and by the business sector, taking advantage of the opportunities offered by the development of next-generation networks. This is translated in three major ambitions:

- Enhance sustainable urban development through upskilling and reskilling
- Provide digital infrastructure, services and content
- Rebranding the city by focusing on digital solutions and open datawarehouse

Eight potential solutions in smart city thematic areas were supported by the local ecosystem. Among them, three solutions have high maturity and fit to local enablers' needs. The prioritized solutions are:

S1: Interoperability Center of the Municipality of Patras

S2: Patras Open Data Platform

S3: Reskilling Upskilling

These solutions highly interact since S1 feeds S2 with data produced by the subsystems, S2 feeds S1 with data for support of decision making and the functionality of S1 and S2 is based on people with advanced digital skills (S3).

ICC played a major role in forging a core working group, which organised weekly teleconferences with the Lead expert weekly for the whole ICC period, maintained the momentum of the Steering Committee and most importantly prepared a set of potential solutions emerged from the stakeholder meetings, which formed the basis for the strategy submitted to the RRF call for smart cities. Despite COVID-triggered difficulties the city succeeded in securing funding for solutions S1 and S2 from the RRF call for major Greek cities, while it expects to fund solution S3 either by the next ESIF calls and/or future EDIH calls.

Mayor Foreword

The vision to become a smart digital city focusing on humans and innovation can only be achieved with systematic, long-term strategic efforts. The DCC initially and now ICC have contributed to these efforts in terms of strategy design, discussions involving all relevant stakeholders and even the selection of appropriate, priority solutions. The project repository platform enables synergies among local actors, while bringing all the stakeholders around the same table, we improve governance and envisage new digital services enhancing the quality of life of our citizens.

By increasing the financial envelope for sustainable urban development strategies, the City of Patras sees a possibility of collaboration with other European cities to benefit from cooperation in advanced technologies, artificial intelligence, new sensing, open data and Internet of Things. Local universities, public research centres and small high-tech companies can benefit from resources and knowhow and meet big societal challenges, such as efficient health management, cleaner environment, green mobility and high-value jobs.

Our participation in ICC was very helpful due to the transfer of know-how from core and mentor cities for the implementation of our digital transformation with an emphasis on smart city solutions and the acquisition of knowledge in good practices and educational material.

The city of Patras 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

1 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

4 Review & way forward

2 months
August 2022 – September 2022

Summary

The city of Patras has availability of digital knowledge, excellent **academic performance** and many projects both finalised and currently implemented by its **stakeholders**. It has an emerging **ecosystem** of ICT companies and increasing **project funding** opportunities through national and EU funding. A **Steering Committee** created in the framework of DCC is also active in ICC with the aim of streamlining the **digital strategy** and ensuring information flow to all interested parties.

According to the local enablers analysis, stakeholders confirmed 8 **smart city solutions** of interest. The city **roadmap** includes **3** moving and growing **high priority solutions** supported by the local ecosystem: S1: **Interoperability Center** of the Municipality of Patras, S2: Patras **Open Data Platform** and S3: **Reskilling Upskilling**. Their **technical maturity** will be driven by an equally strong stakeholder network. For each solution special Initiatives, Activities and Actions are mapped.

The Municipality of Patras submitted to the Ministry of Digital Governance its **Strategic Smart City Plan**, which was successfully approved. The Plan includes solutions S1 and S2. The study of **technical and operational specifications** of S1 are funded by the ROP of Western Greece. The implementation of S1 and S2 have **confirmed funding** by RRF. S3 has a **potential funding** by future EDIH and/or ESIF.

KPIs are set quantitively and qualitatively for the assessment of city performance, solutions' maturity and city ecosystem and activities.

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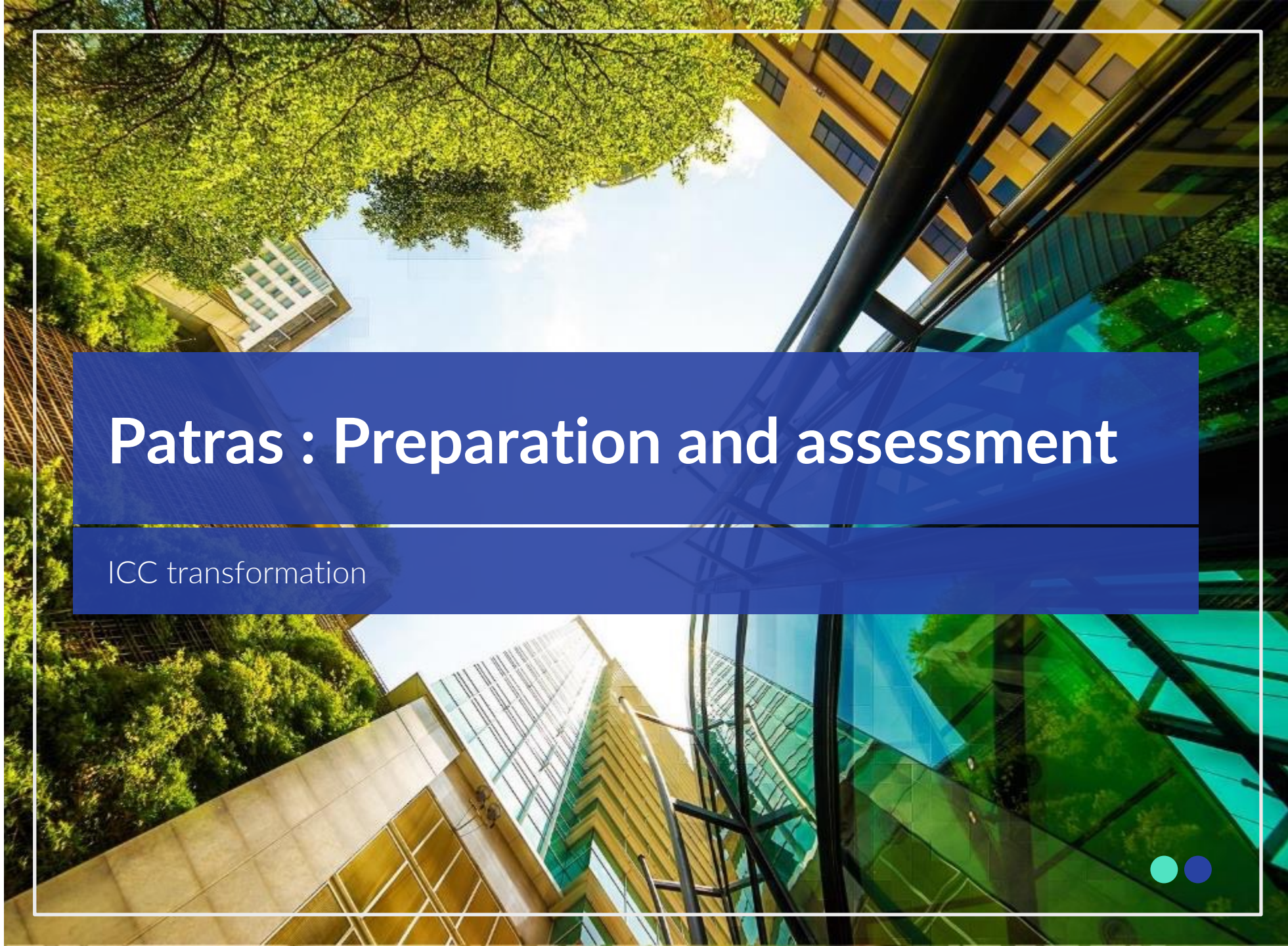
Section

1



Patras : Preparation and assessment

ICC transformation

September 2020 to January 2021

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Introduction

The City of Patras is unique in the significant size and high quality of its Higher Education Institutions and Public Research Centres endowing the city with valuable human capital active in research and innovation pilot projects. This has kickstarted a local, ICT-focused ecosystem enriched by many start-ups and few medium-sized companies expected to transform the city into a vibrant human-centred modern economy.

In this context, as a follower of DCC, ICC came to play a key role in the city's transformation pathway. The activation of all the stakeholders for the vision and ambitions paved the way for a consensus smart-city strategy, the basis for the RRF funding expected in 2022-2023. During the past two years new projects concerning smart cities are in the process of implementation.

ICC is directly aligned with good practices like the Smart City Innovation Hub, the GIS open data platform and the Sense.City platform, which are in full operation. Most of the roadmap activities described in the Digital Transformation Strategy are in progress, the remaining having almost secured funding. Past national calls, like the Tritsis Programme, the future RRF funding already earmarked and the new ESIF will fund initiatives and projects debated in the DCC/ICC context, thanks to the capacity of the stakeholders to design and mature new projects.

The integrated strategy is complemented by a strong interest in developing innovative digital governance applications for remote citizen services as well as distance education applications reinforced by the coronavirus experience.

Design and implementation of projects is driven by a strong human stakeholder network with high technological capacity, which drives local authorities to successful funding opportunities by the Regional Operational Programme and the National Operational Programmes.

City needs: State of the city overview

Significance of insight to what we want to do on the ICC

- Of critical importance to ICC journey and we should be working to change
- Of importance to ICC journey, and we should act to change this along the journey as opportunity presents
- Contextually relevant, but not major point of attention in ICC and unlikely to be impacted on the journey

The state of the city of Patras today

The city benefits from a large number of projects both finalised and currently implemented by its stakeholders. The Municipality has ensured funding for a distributed network of smart sensors that can measure environmental parameters for more effective management of the Historic City Centre, the development of smart ICT applications to promote thematic tourism and a project on the Patras Open Mall, which includes a series of innovative smart city solutions, sustainable urban mobility, urban equipment and infrastructure, preserving unchanged the particular architectural character of the intervention area. At the same time the university institutes and the local research centres are under-taking a large number of projects in environmental, mobility and commercial applications.

A Steering Committee created in the framework of DCC is also active in ICC with the aim of streamlining the digital strategy and ensuring information flow to all interested parties.

Key insights from city performance analysis

Higher performance observed	Lower performance observed
1 Availability of digital knowledge, excellent academic performance and pilots	1 Citizen participation
2 Emerging ecosystem of ICT companies	2 Low digital literacy in the business sector
3 Increasing project funding opportunities through national and EU funding	3 Limited opportunities to scaleup pilot experiences
4 Increasing stakeholder interest for collaboration	4 Lack of own resources at municipal level
5 Local Digital Hub	

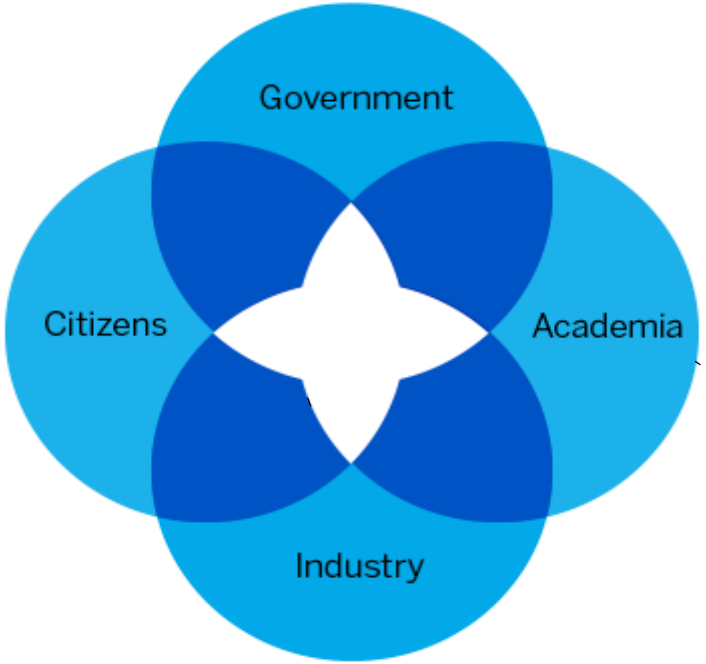
Mapping of local enablers

Municipality of Patras

Region of Western Greece

Non profit support organisations (NGO)

Citizens use the sense.city platform



Three Universities: University of Patras, University of Peloponnese, Hellenic Open University

Three Research Centers / Institutes: Computer Technology Institute and Press, Industrial Systems Institute / ATHENA Research Center, Foundation of Research and Technology

Business Support / Incubation: Patras Science Park

Growing number of Start-ups

Vivid business ecosystem in the ICT sector

Few larger companies

Majority of small traditional SMEs

City Ecosystem - Working Norms and Trends

- *Many projects and pilots but coordination is lacking*: many research teams in all research and educational establishments are active in research and pilot projects, funded both through national and EU sources often in cooperation with local authorities. Coordination to avoid duplication and ensure synergies (e.g. joint exploitation of sensors) was mentioned and ICC constitutes an opportunity for this.
- *Entrepreneurship* is not sufficiently developed but is on the rise. ICT, AI, IoT are areas where start-ups are making progress; the Patras Science Park and smaller initiatives are supporting this pathway but a lot more is necessary, and the local Chambers (Commerce/Industry and Technical) want to be involved in helping their members to adopt digital solutions. Digital tourism is a case of special interest.
- *Human Resources and capacity building* is a strength of the City, but the ambitious strategy developed calls for a more and better skilled workforce at all levels. The local Digital Innovation Hub is important but needs reinforcement to ensure a continuous Reskilling and Upskilling of the workforce. Close collaboration of all actors able to participate in training is key for succeeding in this challenge.
- *The digital transformation of the Public Administration* has started but is still in need of basic infrastructure, a break with path dependencies and a change of working norms. Beside a common platform the issues of open data; traffic and health were mentioned as areas of priority.

ICC strategy: Vision and ambition statements

The vision of Patras is to become a smart digital city with the aim to improve the living conditions of its citizens, professionals and visitors through the active involvement of its human resources, through innovative initiatives by academic and research institutes and by the business sector, taking advantage of the opportunities offered by the development of next-generation network

1. Enhance sustainable urban development through upskilling and reskilling to increase business development and digital employment

1. The underlying rationale relates to the opportunities to activate citizens and businesses through the reskilling of professionals into digital technologies.
2. Upskill professionals creating opportunities for local companies to both participate as users and as producers of applications of digital technologies.
3. This responds to the challenge to modernize local society and business meeting global competitive pressures.

2. Provide digital infrastructure, services and content to citizens and businesses quickly and easily, everywhere

1. The underlying rationale relates to the need to support and activate citizens and businesses and create new tools offered by the local and regional administration.
2. Incumbents are lagging behind in terms of exploiting the opportunities offered by digital technologies, hence the offer of both infrastructure and services is expected to mobilise incumbents and help them overcome the small size of the local market as well as problems of access to finance.
3. Bridge the gap between academic research offer, local administration and the business sector.

3. Rebranding the city by focusing on digital solutions and open data-warehouse benefiting the entire city ecosystem

1. The underlying rationale is connected in particular to facilitating the daily life of citizens and visitors.
2. Exploit the potential offered by the open data-warehouse for energy efficiency and sustainability.
3. Creation of open APIs and open data offered for exploitation by young scientists, researchers and the business sector.

List of City Solutions

City Solutions	Link to Ambition Statements (AS)
S1: Interoperability Center of the Municipality of Patras	AS2, AS3
S2: Patras Open Data Platform	AS2, AS3
S3: Citizen awareness and activation – Citizen Science	AS2, AS3
S4: Public building energy saving	AS1
S5: Electromobility planning	AS1, AS3
S6: Reskilling Upskilling	AS1, AS2, AS3
S7: SafeAmea & Civil Protection	AS2, AS3
S8: Green and Digital Transition in Tourism	AS3

Priority City Solutions

The initial selection of the 3 (among 8 solutions) was based on extensive discussions within the group:

Solution 1: Interoperability Center of the Municipality of Patras

Solution 1 helps the city of Patras to achieve the 2nd and 3rd ambition by creating an interoperability center for integration, control and monitoring of smart infrastructure and services of the Municipality of Patras. The aim of this idea is to monitor and manage better the applications' performance as a single Dashboard and providing decision support tool. The center is in progress, but staff is needed for operation maintenance.

Solution 2: Patras Open Data Platform

Solution 2 helps the city of Patras to achieve the 3rd ambition by providing digital infrastructure, services and content, in this case open data, to citizens and businesses quickly and easily at any time and enhancing sustainable urban development through the implementation of large-scale cutting-edge technologies. The aim is to concentrate data measurements regarding the environment parameters at the beginning and evolute the platform fed by different technological subsystems (environment, energy, transport, …) with open data belonging either to the municipality or other organisations/ bodies and will be disposed free to use and mainly for exploitation. A collective cooperation of the stakeholders is needed for achieving this open data platform.

Solution 3: Reskilling Upskilling

Solution 3 helps the city of Patras to achieve the 1st and 3rd ambition as advanced digital skills are needed for adopting digital solutions and making Patras a pole for citizens, visitors' attraction and tourists' destination and enhancing sustainable urban development through the implementation of large-scale cutting-edge technologies. The adequate target groups of SMEs for advanced digital skills must be identified.

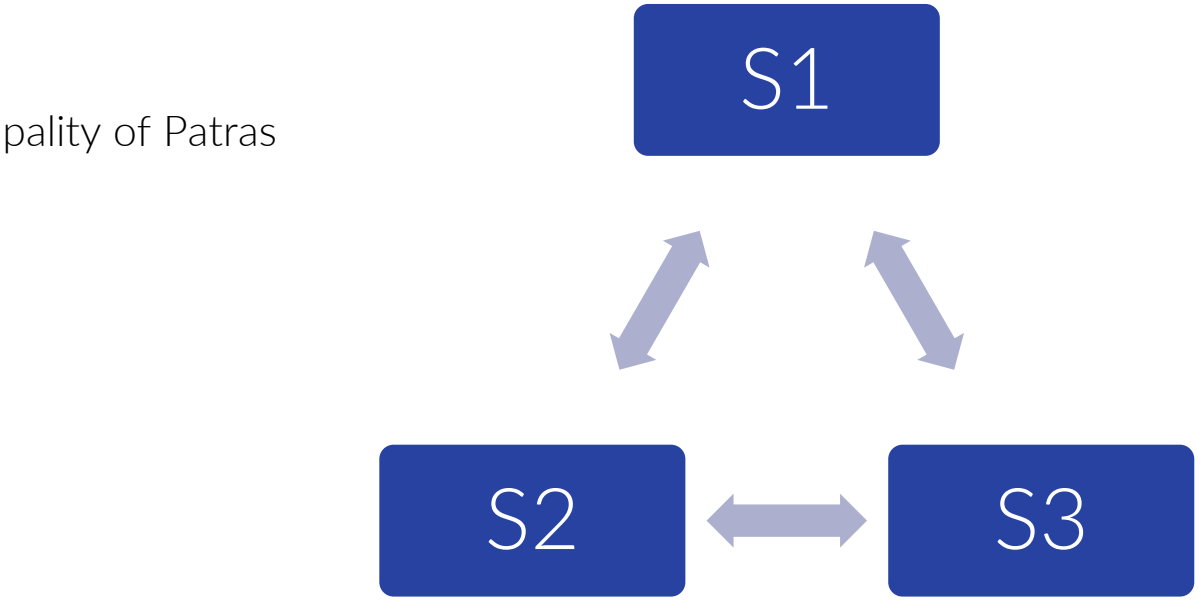
Interaction of win Solutions S1, S2, S3

Win Solutions

S1: Interoperability Center of the Municipality of Patras

S2: Patras Open Data Platform

S3: Reskilling Upskilling



- The Interoperability Center will feed the Open Data Platform with data produced by the subsystems
- The Open Data Platform will feed the Interoperability Center with data for combination and support of decision making
- The functionality of both Interoperability Center and Open Data Platform will be based on people with advanced digital skills

Key factors for success

Major activities to be undertaken as key factors for success

- The continuity of operation of the repository-platform where local stakeholders report their past and current projects facilitates interaction and hopefully in the future coordination
- Validation of solutions by looking at existing solutions that have already been developed in other cities, in particular an interoperability model for creating a system of open data governance or applications for smart cities
- Information in Living Labs and tailor-made expertise are highly appreciated
- Activation of the Patras ICC governance scheme around the established Steering Committee with representatives from the entire ecosystem of the city
- Intervention at policy level for the inclusion of city solutions in the next programming period 2021-2027 – funding sources from National and Regional Operational Programmes and Recovery and Resilience Facility

Key areas of pending uncertainty

- Regulatory / legislative framework - Bureaucracy for implementation
- Lack of human resources at the municipal level for operation and maintenance and not confirmed financial resources for operation and maintenance
- The intention of the stakeholders to distribute their open data on a central platform and the mechanism for approval of the open data quality
- Interoperable standardized service solutions integrated over a common platform
- Resolve data ownership issues / privacy issues related to integration of sensory data from different smart city applications
- Efficient diagnosis of missing digital skills for the restructuring of the local economy

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Patras : Ambition and roadmap

ICC Transformation

February 2021 to May 2021

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S1: Interoperability Center of the Municipality of Patras

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
Activity 1	Mapping of infrastructure, services and interfaces of vertical smart city platforms																	
Activity 2			Design the operational model, covering the required organizational structure, processes and systems															
Activity 3						Definition of the technical and functional requirements												
Activity 4											Funding and Implementation							
Milestones		✶M1						✶M2		✶M3								

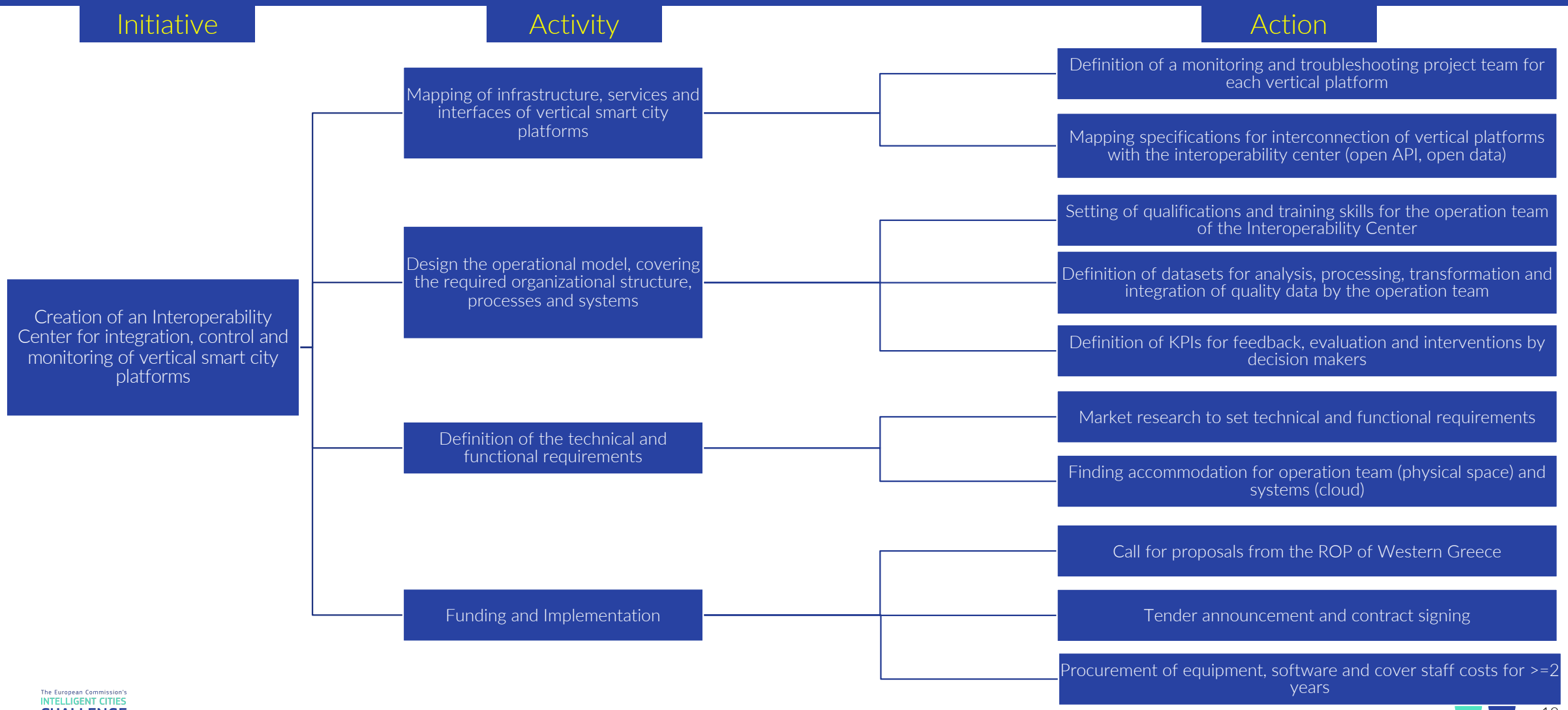
M1 - Mapping of existing subsystems (infrastructure, services and interfaces)

M2 – Design the operational model and staffing the operation team

M3 - Proposal preparation and funding allocation

Roadmap S1: Interoperability Center of the Municipality of Patras

The roadmap of Solution 1 includes 1 main Initiative broken down into 4 Activities. For each activity the Actions to be performed are determined.



Rationale to roadmap - S1: Interoperability Center of the Municipality of Patras

Each Activity has the following scope:

- Act_1: Setting specifications for interconnection of vertical platforms with the interoperability center
- Act_2: Definition of datasets, KPIs and qualifications of the operation team
- Act_3: Preparatory work and maturation for operation based on implemented best practices
- Act_4: Procedures for funding and procurement

Three (3) critical Milestones have been set:

- Mil_1: Mapping of existing subsystems (infrastructure, services and interfaces) – 2nd month
- Mil_2: Design the operational model and staffing the operation team – 8th month
- Mil_3: Proposal preparation and funding allocation – 10th month

The limitations – risks for each Activity are the following:

- Act_1: Reduced availability of municipal staff
- Act_2: Funding for staff cost and skills of team members
- Act_3: Intention of companies to provide detailed information
- Act_4: Sufficient amount of funding for the establishment and operation

Initiative charter: S1 - Interoperability Center of the Municipality of Patras

Strategy

Description

What: Solution 1: Interoperability Center of the Municipality of Patras Initiative: Creation of an Interoperability Center for integration, control and monitoring of vertical smart city platforms
Why: A single Dashboard for monitoring applications' performance by interconnecting different subsystems and providing a supervisory management and decision support tool
How: 4 Activities: Mapping, Operational model, Specifications, Funding-Implementation

Link to vision

The creation of an interoperability center is fully consistent with the vision of Patras to become a smart digital city with the aim to improve the living conditions of its citizens, professionals and visitors

Link to ambition statement

S1 is relevant to Ambition Statement 2 by providing digital infrastructure, services and content to citizens and businesses quickly and easily, everywhere and to Ambition Statement 3 for the rebranding of the city by focusing on digital solutions and open datawarehouse benefiting the entire city ecosystem

Expected impact and timing

- Mapping of infrastructure, services and interfaces of vertical smart city platforms (M1-M2)
- Design the operational model, covering the required organizational structure, processes and systems (M3-M8)
- Definition of technical and functional requirements (M6-M10)
- Implementation of a well designed solution (M11-M18)

Stakeholders involved

Solution lead: Municipality of Patras (MoP)

Solution working team:
Petros Ganos (MoP)
Andreas Gkontzis (MoP)
Vasileios Darsinos (MoP)

Contributors:
University of Patras
Hellenic Open University
University of Peloponnese

Risks / Mitigation

- Full maturity for the call proposal funded from RRF / Study for technical and operational specifications implemented by the University of Patras and funded from ROP
- Availability of municipal staff for mapping of vertical platforms / Cooperation agreement with HEIs and Research Centres
- Funding for staff cost of the Interoperability Center / Potential funding from ROP
- Special skills of operation team / Interaction with Solution S3

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

- Confirmed funding from ROP (20,000 € for technical and operational specifications implemented by the University of Patras)
- Confirmed funding from RRF (410,000 € for equipment and software)
- Potential funding from ROP for external staff cost (120.000,00 € for 2 persons for 2 years)
- Permanent municipality employees (4 persons)
- Annual cost (80,000 € appr.) for the operation of the Interoperability Center (internal and external staff cost, maintenance cost, operation cost)

Solution maturity outputs

- Existing datasets for their integration in the interoperability center
- New datasets including ones generated by the combination of existing datasets
- Retraining of the municipal operation team in new digital skills
- Increased efficiency and effectiveness of the Municipality of Patras
- Conformance to adequate interoperability technological standards
- Contribution to open data mentality

City performance outcomes and impacts

- Exploitation of open datasets by the academic and research community as well as companies
- New services offered to city ecosystem
- Citizens participation in online platforms
- Contribution of the interoperability center to the smart city policy
- Impact on the behavioral change of the local public administration

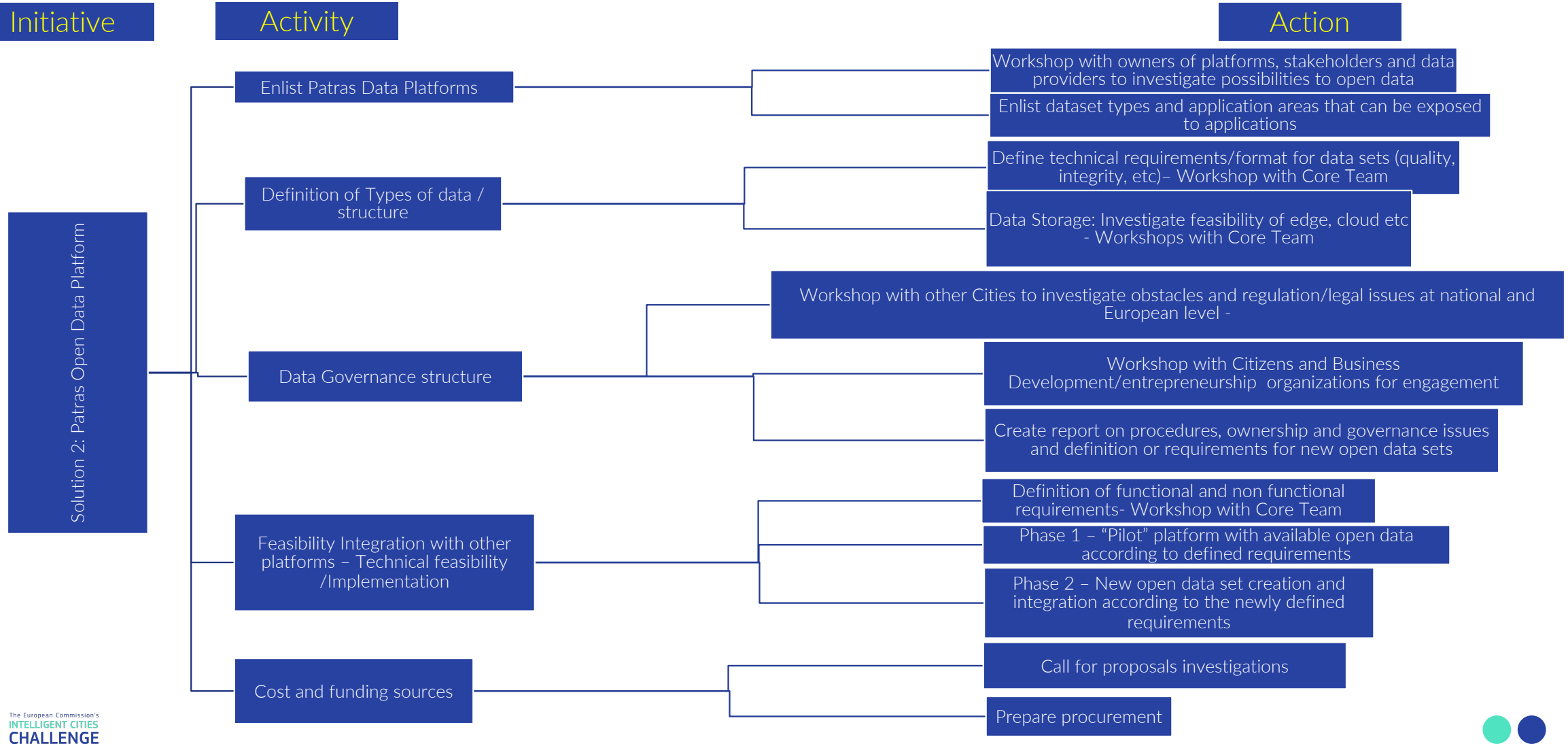
S2: Patras Open Data Platform

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
Activity 1	Enlist Patras Data Platforms																	
Activity 2					Definition of Types of data / structure													
Activity 3					Data Governance structure													
Activity 4										Feasibility Integration with other platforms – Technical feasibility /Implementation								
Activity 5															Cost and funding sources			
Milestones						✶M1						✶M2	✶M3	✶M4			✶M5	

M1 - List of Datasets
M2 – First draft on requirements
M3 - Report on governance
M4 - Report on technical requirements
M5 - Draft proposal preparation

Roadmap Solution 2: Patras Open Data Platform

The roadmap of Solution 2 includes 1 main Initiative broken down into 5 Activities. For each activity the actions to be performed are determined.



Rationale to roadmap – S2: Patras Open Data Platform

Each Activity has the following scope:

- Act_1: Ensure all data types already available and platforms available will be integrated in the platform
- Act_2: Describe requirements for data based on experience and legislation
- Act_3: Describe policies/best practices about opening data based on experiences and legislation
- Act_4: Define the technical details and possible implementation of the platform
- Act_5: Create the procurement and the platform

Five (5) critical Milestones have been set:

- Mil_1: List of Datasets – 6th month
- Mil_2: First draft on requirements – 12th month
- Mil_3: Report on governance – 13th month
- Mil_4: Report on technical requirements – 14th month
- Mil_5: Draft proposal preparation – 17th month

The limitations – risks for each Activity are the following:

- Act_1: Large variety of data sets and types
- Act_3: Proposed governance structure not successful in persuading stakeholders to commit
- Act_4: Technical characteristics not combatable with Solution 1 or other platform
- Act_5: Funding cannot be guaranteed, Procurement not successful

Initiative charter: S2 – Patras Open Data Platform

Strategy

Description

What: The solution concerns the development and operation of a platform that will facilitate the creation and mainly access of open data by all City stakeholders and mainly citizens, researchers and entrepreneurs, for City related application development. **Why:** The creation of the specific open data platform is recognized as of potential value together with the respective governance structure and Open Data policies. **How:** Through 5 well defined activities

Link to vision

The vision of Patras is to become a smart digital city, and the creation of an open data platform will support applications and services that will improve the living conditions of its citizens, professionals and visitors

Link to ambition statement

Solution 2 is relevant to ambition statement 2 and 3 as it will consist part of the digital infrastructure, services and content available openly to citizens and businesses quickly and easily (statement 2) and furthermore this platform will comprise the core part of the open datawarehouse benefiting the entire city ecosystem (statement 2

Expected impact and timing

It is expected that for this solution to create an impact the data publication chain should be considered for several types of data related to urban planning, tourism, and even real-time data in the transport area

Timing of impact is expected as soon as data platform is available

Stakeholders involved

Solution lead: Municipality of Patras (MoP)

Solution working team: Petros Ganos, Tanya Politi, Spyros Denazis, Spyros Syrmakesis, Andreas Kazantzidis, Chrysostomos Stylios, Sotiris Michalopoulos, Vasileios Verykios, Athanasios Kalogeras

Contributors: Municipality of Patras, University of Patras, Hellenic Open University, University of Peloponnese, CTI, ISI

Risks / Mitigation

The technical requirements are critical:

- Large variety of data sets and types / Standardized technologies will be proposed and data evaluation will be performed

- Proposed governance structure very critical for persuading stakeholders to commit / Communication and workshops with stakeholders will minimize this risk

- Technical characteristics should be compatible with Solution 1 or other platform / Standardized requirements should be described during the procurement

- Funding for operating the platform needs to be guaranteed / Funding will be sought through other sources like research projects etc

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

- Confirmed funding from RRF (150,000 € for equipment and software)
- Potential funding from ROP for external staff cost (120,000 € for 2 persons for 2 years)
- Permanent municipality employees (2 persons)
- Annual cost (80,000 € appr.) for the operation of the open data platform (internal and external staff cost, maintenance cost, operation cost)

Solution maturity outputs

- Closed datasets becoming open from municipality and other sources
- New applications created
- Solutions for single smart city domains or trans thematic
- Contribution to open data mentality
- Private sector participating to the open data platform

City performance outcomes and impacts

- Research generated using open data from the platform
- Company income generated by the use of open data
- Impact of use of open data on sustainability
- Enhancement of citizens science
- Impact of use of open data on citizens' everyday life
- Impact of use of open data on public sector increased efficiency

S3: Reskilling Upskilling

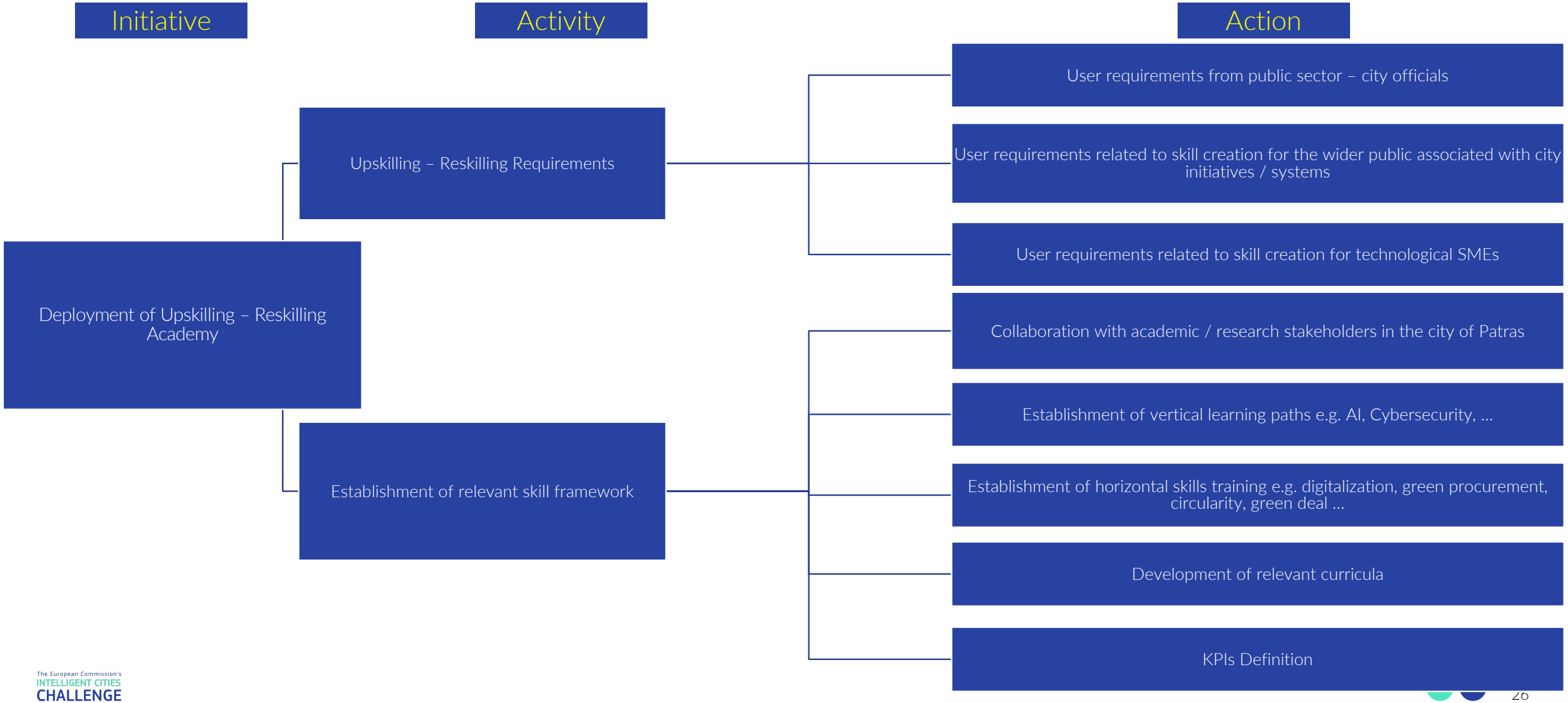
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40
Initiative 1									Activity 1: Upskilling – Reskilling Requirements		Activity 2: Establishment of relevant skill framework																													
Initiative 2															Activity 3: Upskilling activities																									
															Activity 4: Other skill related activities																									
Initiative 3	Activity 5: Locating relevant funding																																							
Milestones								✶ M1						✶ M2																											

M1 - Proposal preparation and funding allocation

M2 – Establishment of Upskilling – Reskilling Academy

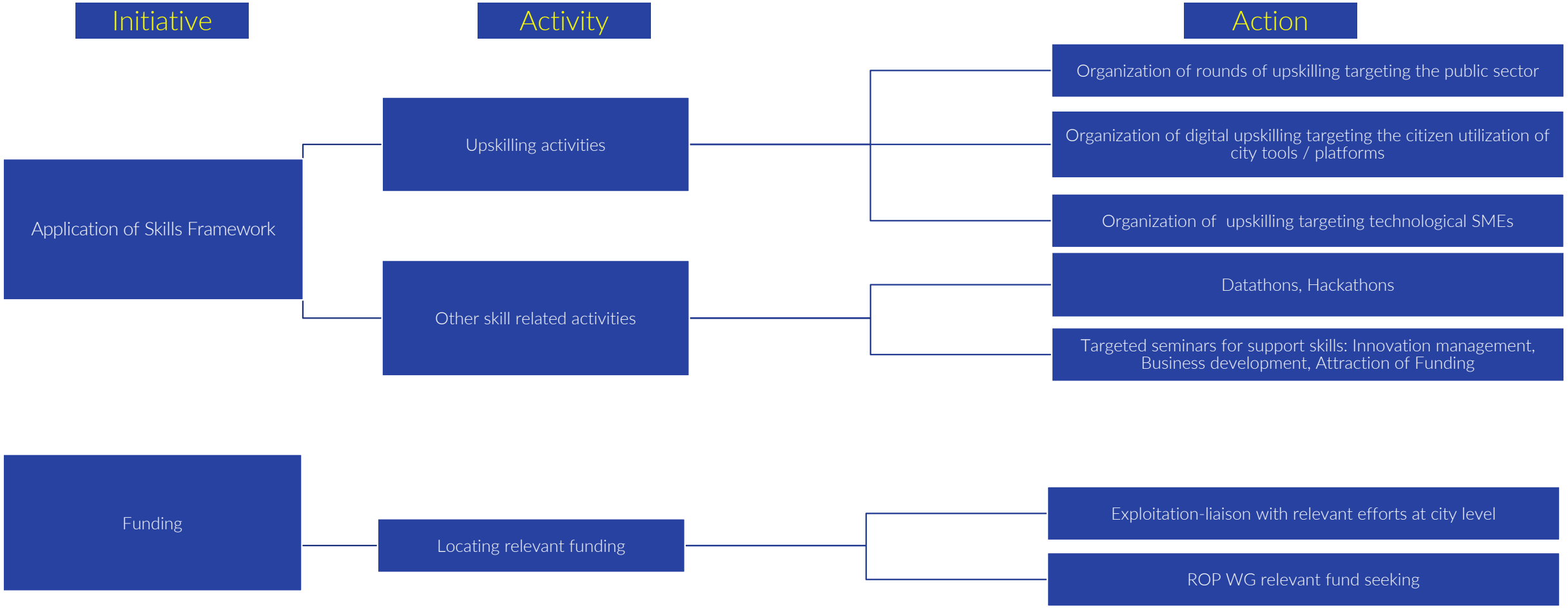
Roadmap S3: Reskilling Upskilling

The roadmap of Solution 3 includes 3 main Initiatives broken down into 5 Activities. For each activity the Actions to be performed are determined.



Roadmap S3: Reskilling Upskilling

The roadmap of Solution 3 includes 3 main Initiatives broken down into 5 Activities. For each activity the actions to be performed are determined.



Rationale to road map – S3: Upskilling - Reskilling

Each Initiative has the following scope:

- Ini_1: Setting specifications for needed skills by the public sector, the wider public for utilization of city platforms and services, and technologically advanced SMEs. Establishment of at least 2 vertical learning paths (AI, Cybersecurity). Establishment of training for at least 10 horizontal skills. Establishment of relevant curricula.
- Ini_2: Upskilling activities towards public sector officials. Upskilling activities towards technologically advanced SMEs. Awareness – training activities towards the general public. Datathons – hackathons. Targeted seminars.
- Ini_3: Ascertaining the necessary funding for implementation of initiatives 1 and 2

Two (2) critical Milestones have been set:

- Mil_1: Establishment of Upskilling – Reskilling Academy – 8th month
- Mil_2: Proposal preparation and funding allocation – 14th month

The limitations – risks for each Initiative are the following:

- Ini_1: Funding is not ascertained.
- Ini_2: Funding is not ascertained. Active collaboration of academia – research.
- Ini_3: EDIH proposal is not selected for funding and Municipality does not manage to secure funding.

Initiative charter: S3 – Reskilling Upskilling

Strategy

Description

What: The solution concerns the establishment of an Upskilling – Reskilling Academy making possible the wide diffusion of technological benefits of the regional ecosystem enhancing overall digital maturity. **Why:** The need for upskilling – reskilling is prevalent with reference to both the public sector in the Region, including the city of Patras, as well the entire ecosystem of SMEs and enterprises. **How:** Through 3 initiatives comprising in total 5 relevant activities.

Link to vision

The vision of Patras to become a smart digital city, and to this end both elementary and advanced digital skills are mandatory for the entire ecosystem to support new applications and services that will improve the living conditions of its citizens, professionals and visitors

Link to ambition statement

Link to ambition statement 1 directly associated to upskilling – reskilling to enhance sustainable urban development and to ambition statement 3 associated to city rebranding focusing on digital solutions and mandating digital skills by the entire city ecosystem

Expected impact and timing

It is expected that the solution will provide necessary curricula for upskilling – reskilling in the area driving digitalization and intelligence and will offer upskilling – reskilling towards city / public sector officials. Overall timing is 40 Months.

Stakeholders involved

Solution lead

Municipality of Patras (MoP), Region of Western Greece (RWG)

Solution working team

Athanasios Kalogeras, Vasileios Triantafyllou, Vasileios Verykios, Spyros Denazis, Christos Kritsonis, Petros Ganos

Contributors

Industrial Systems Institute, University of Peloponnese, University of Patras, Hellenic Open University, Chamber of Achaia

Risks and mitigation

Funding cannot be ascertained

Different funding sources are investigated comprising EDIH call 2023, ESIF, RWG ROP

Collaboration between the ecosystem is not ascertained

Governance structure pursued by ICC (Steering Committee) involves public administration, academia / research, SMEs / businesses; existing collaborations are further enhanced driven by ICC

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

- Potential funding (future EDIH, ESIF) for the cost of establishment of curricula (~200,000 €)
- Potential funding (future EDIH, ESIF, in-kind contribution by academic stakeholders) for application of skills framework and organization of upskilling – reskilling towards the local ecosystem for a period of 2 years (~500,000 €)

Solution maturity outputs

- Curricula established
- Vertical learning paths established
- Datathons / Hackathons organized
- Local/Regional public sector bodies making use of upskilling reskilling services
- Local/Regional public sector employees making use of upskilling reskilling services
- SMEs making use of upskilling reskilling services

City performance outcomes and impacts

- Digital services penetration
- New start up companies
- Increased citizen awareness
- Impact on the behavioral change of the local/regional public administration
- Decrease of unemployment rate in the city/region
- Spillover effect to traditional SMEs

S1: Key Performance indicators - overview

Solution	Activities – Inputs and actions	Solution Maturity - outputs	City performance – outcomes and impacts
S1: Interoperability Center of the Municipality of Patras	1. Existing smart subsystems (infrastructure and services) of the Municipality of Patras to be integrated in the Interoperability Center (2 mobility, 3 energy, 1 environment, 1 water management, 1 GIS platform with 3 vertical applications, 1 tourism, 2 culture, 3 citizen e-services, 1 connectivity) 2. Smart subsystems (under development) of the Municipality of Patras to be integrated in the Interoperability Center (5 mobility, 2 waste management, 1 culture) 3. Employees of the Municipality of Patras with digital skills who will be involved in the operation of the Interoperability Center 4. Annual cost for the operation of the Interoperability Center (~ 80,000) and for future development: (~150,000)	1. # of datasets for their integration in the interoperability center: 23 2. # of new open datasets including ones generated by the combination of existing datasets: min. 5 3. # of persons of the Interoperability Center operation team with new advanced digital skills: min. 4 4. % of shared datasets incorporated in the platform: target 100%, realistic estimation 75%	1. Annual # of students and researchers of the academic and research community utilizing the open datasets (available by S1): min. 50 annually 2. # of open datasets to be available for exploitation by any stakeholder: min. 5 per year 3. % of citizens participation in online platforms: +10% per year 4. # of digital services offered by the local ecosystem: +20% per year 5. # of additional smart city datasets to be integrated in the Interoperability Center: min. 10 in 5 years

S2: Key Performance indicators - overview

Solution	Activities – Inputs and actions	Solution Maturity - outputs	City performance – outcomes and impacts
S2: Patras Open Data platform	1. Investigate existing Municipal and non Municipal platforms 2. Definition of technical requirements, Technical feasibility /Implementation (data types, governance structure) 3. Annual cost for the operation of the Open Data Platform: ~80,000	1. # of technical and functional requirements reports 2. # of datasets integrated in the open data platform 3. # of new applications created 4. # of Patras citizens using the GIS platform	1. Annual # of students and researchers of the academic and research community utilizing the open datasets (available by S2): min. 50 annually 2. # of open datasets to be available for exploitation by any stakeholder: min. 5 per year 3. % of citizens participation in online platforms: +10% per year

S3: Key Performance indicators - overview

Solution	Activities – Inputs and actions	Solution Maturity - outputs	City performance – outcomes and impacts
S3: Reskilling – Upskilling	1. Establishment of Reskilling – Upskilling Academy 2. Review academic – research – business collaborations and their existing curricula 3. Funding for the development of the Academy 4. Annual cost of the Academy	1. SMEs exploiting reskilling – upskilling services per year: 100 2. Public sector (city and beyond) employees exploiting reskilling – upskilling services per year: 200 3. Datathons / hackathons organized per year: 1; participation by at least 50 competing teams / stakeholders 4. Develop new curricula: 5 per thematic area	1. ICT related qualified jobs in companies and the public sector: +10% yearly growth 2. # of digital services offered by the local ecosystem: +20% per year 3. New tech start up companies by the local ecosystem: +10% yearly growth

Key Performance indicators - Cross cutting indicators

Cross cutting indicators: City performance – outcomes and impacts
Annual number of students and researchers of the academic and research community utilizing the open datasets
Number of open datasets to be available for exploitation by any stakeholder
Percentage of citizens participation in online platforms
Number of digital services offered by the local ecosystem

Rationale to KPI approach

S1 - Interoperability Center of the Municipality of Patras In the context of the ambition to **Provide digital infrastructure, services and content to citizens and businesses quickly and easily, everywhere**

The Interoperability Center is crucial for ensuring maximum synergies, minimizing overlaps and increasing the effectiveness of the Municipality. In that sense the KPIs selected reflect the initial and annual inputs necessary for the system to work; the existing and future datasets that will be incorporated so that synergies are ensured as well as their utilization by the research community adding value and inspiring citizen participation.

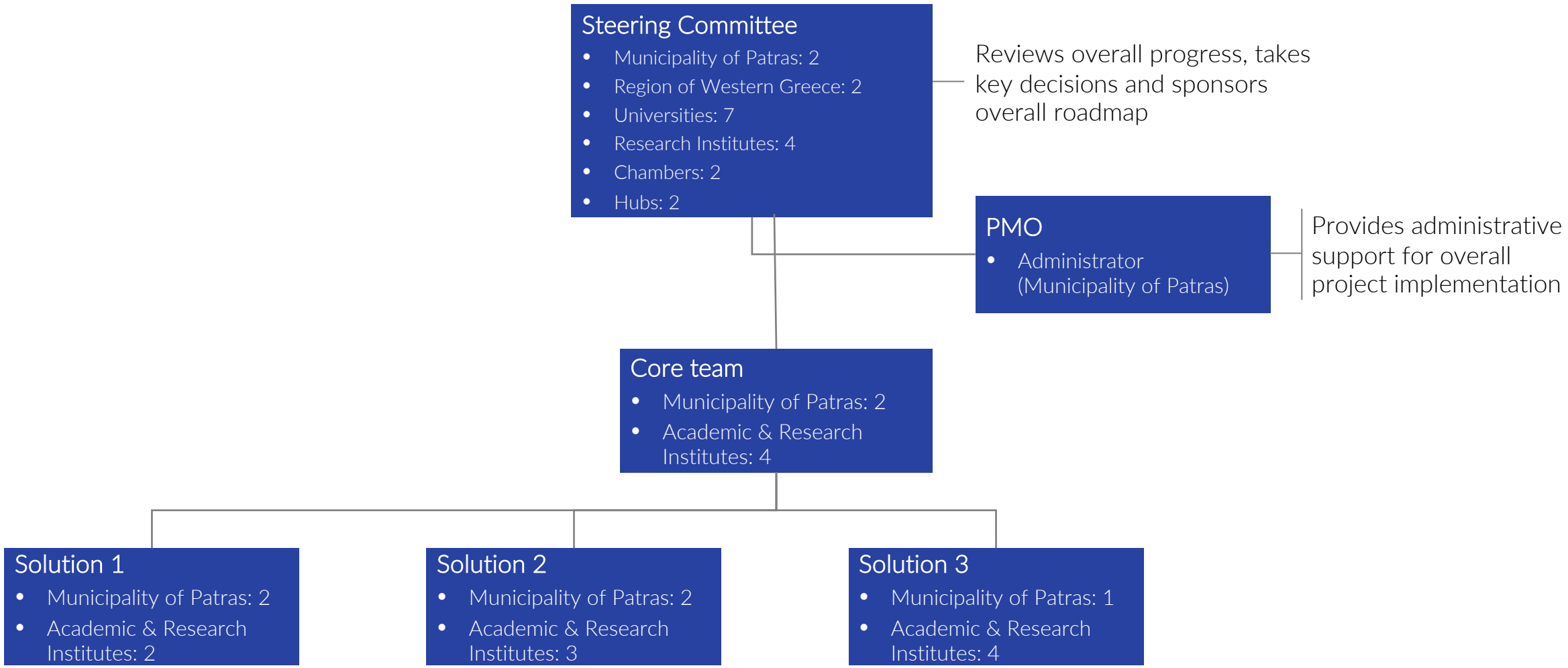
S2 - Patras Open Data Platform, deriving from the ambition to **Rebranding the city by focusing on digital solutions and open data-warehouse benefiting the entire city ecosystem**

Open Data is at the core of the interest of smart city development because of the contribution of open data to new social and economic opportunities and transparency being a cornerstone of democracy. In that sense the KPIs selected reflect the activities needed to ensure a transition pathway to opening up currently closed or totally neglected datasets, initially the municipal data and then go beyond them. Most importantly the KPIs capture the ultimate impact of the opening to the use of open data for researchers, business and finally all citizens.

S3 – Upskilling – Reskilling, deriving form the ambition to **Enhance sustainable urban development through upskilling and reskilling to increase business development and digital employment**

Smart city trajectories are based on skills and Patras has an ecosystem that can significantly contribute to making the city a hub of competences. Indicators reflect the way existing organisations can join forces to develop the necessary curricula, attract public and business employees (not only within Patras but also serving weaker municipalities in the neighbourhood) to improve their skills and through this upskilling giving Patras the opportunity to develop based on highly-skilled modern jobs as well as launching tech startups.

Governance structure for roadmap implementation



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Section

3+4

Patras : Impact

ICC Transformation

February 2021 to May 2021

European Commission | The Intelligent Cities Challenge is funded by COSME, the EU programme for Competitiveness of Enterprises and SMEs

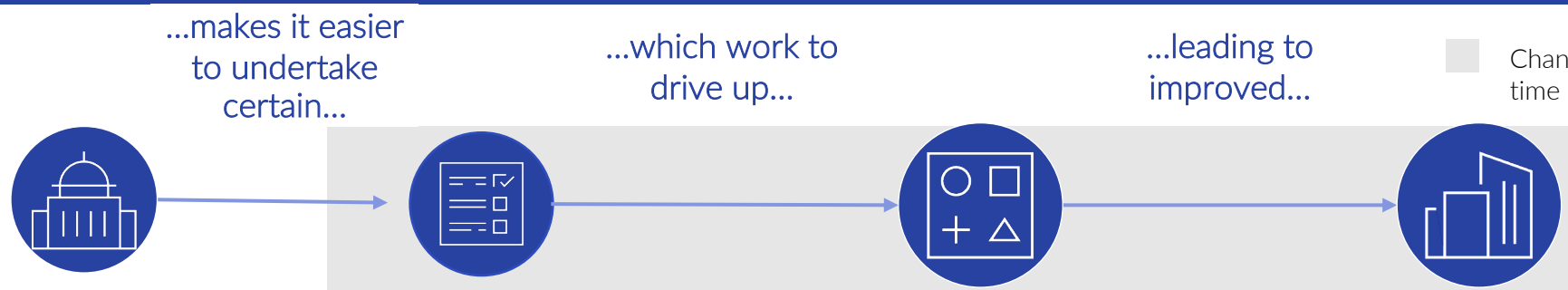
Impact executive summary

The Greek cities do not have their own development budget for major infrastructure and new ambition projects and depend on national budget lines and competitive programmes from the State and the EU. Consequently, their projects are piecemeal, responding directly to the requirements of individual calls for tenders or proposals in order to ensure funding. ICC has been a great opportunity for the City of Patras to engage in a strategic exercise and connect local stakeholders and their projects, while discussing future needs. Starting with DCC, the ICC continuation helped actors

- to present their projects in a common repository created and monitored in the context of DCC/ICC,
- organize an ad hoc Steering Committee, which meets regularly and discussed progress and needs thus forging the linkages that allow for synergies (e.g. common exploitation of sensors), partnerships for new projects and a broader exchange of the very rich scattered knowledge of the research community.

The creation of a common vision and ambitions has helped select the prioritized solutions, which are now at the core of the request for RRF support but also discuss a longer list of potential solutions that can form the nucleus of the digital transition in the 2021-2027 programming period. However, as often the case, implementation was slow because of the lack of a dedicated municipal budget and certain regulatory/institutional burdens.

There are four types of measurable concepts that come together to drive success in the ICC



Idea	Local enablers –city characteristics	Activities – actions and inputs	Technology maturity – outputs	City performance – outcomes and impacts
Description	Each city has unique strengths and weaknesses that help action happen. These can be stakeholder networks, local capabilities, cultural factors or many more that drive success in ICC projects.	A cities main intervention on the ICC is to take actions. These can be direct (e.g., procuring technology), or indirect, (e.g., forming a working group on a topic). The right actions can lead to the right inputs going in to the ICC (e.g., funding, time)	Cities can drive technological solutions to try and improve city performance. How well these solutions are currently used can be described as their 'maturity', - considering whether they are available for stakeholder use, what stakeholders think of them, and so on	Success of an intelligent city is ultimately measured by its ability to address city needs. These can be considered an improved quality of citizen life and a better environment for stakeholders
Example	A history of strong collaboration between city and a local university...	...allows the creation of a new e-health pilot project using social housing in the city...	...leads to the launch a new tele-health solution utilising 4G data connections...	...resulting in pre-emptive diagnosis and lower wait times at medical facilities

Assessment of city performance - progress against KPIs

	Where we started	Midway through the challenge	Final results
City performance			
1 KPI 1: Annual number of students and researchers of the academic and research community utilizing the open datasets (cross cutting)	~20	80	120
2 KPI 2: Number of open datasets to available for exploitation by any stakeholder (cross cutting)	2	20	50
3 KPI 3: Percentage of citizens participation in online platforms (cross cutting)	8%	15%	40%
4 KPI 4: Number of digital services offered by the local ecosystem (cross cutting)	5	15	30
5 KPI 5: Number of additional smart city datasets to be integrated in the interoperability Center (S1)	0	23	30
6 KPI 6: ICT related qualified jobs in companies and the public sector (S3)	5%	7%	10%
7 KPI 7: New tech start up companies in the local ecosystem (S3)	5%	10%	20%

Assessment of city performance - discussion

The three priority solutions give an important perspective for rapid increment of the digital performance for the city of Patras. These solutions are not independent from each other but there is strong interaction between them, since the Interoperability Center will feed the Open Data Platform with data produced by the smart subsystems, the Open Data Platform will feed the Interoperability Center with data for combination and support of decision making and the functionality of both solutions will be based on people with advanced digital skills (supported by Solution 3).

It is expected that there will be strong increasing interest by students and researchers of the academic and research community for the utilization of the produced open datasets, while ensuring openness of data for exploitation by any stakeholder. Also, a rapidly growing number of digital services based on open data will be offered by the local ecosystem that will have as a result the increase of citizens participation in online platforms.

The implementation of solutions contributes to the disposal of ICT related qualified jobs in companies and the public sector and encourages the creation of new tech start up companies by the local ecosystem.

Assessment of solution maturity - progress against KPIs

	Where we started	Midway through the challenge	Final results
Solution 1: Interoperability Center of the Municipality of Patras			
1 **KPI 1**: Number of datasets for their integration in the interoperability center	0	23	30
2 **KPI 2**: Number of new open datasets including ones generated by the combination of existing datasets	0	5	8
3 **KPI 3**: Number of persons of the Interoperability Center operation team with new advanced digital skills	0	2	4
4 **KPI 4**: Percentage of shared datasets incorporated in the platform	0%	50%	75% - 100%

Assessment of solution maturity - progress against KPIs

Solution 2: Patras Open Data platform	Where we started	Midway through the challenge	Final results
1 KPI 1: Number of technical and functional requirements reports	1	2	4
2 KPI 2: Number of datasets integrated in the open data platform	0	20	50
3 KPI 3: Number of new applications created	0	2	6
4 KPI 4: Number of Patras citizens using the GIS platform	2,000	4,000	10,000

Assessment of solution maturity - progress against KPIs

	Where we started	Midway through the challenge	Final results
Solution 3: Reskilling – Upskilling			
1 **KPI 1**: SMEs exploiting reskilling – upskilling services per year	0	100	150
2 **KPI 2**: Public sector (city and beyond) employees exploiting reskilling – upskilling services per year	0	200	300
3 **KPI 3**: Datathons / hackathons organized per year	2	3	5
4 **KPI 4**: Develop new curricula	0	3	5

Assessment of solution maturity - discussion

Solution 1 maturity

The number of datasets produced by the existing smart subsystems that are integrated in the Interoperability Center as well as new open datasets including ones generated by the combination of existing datasets and the shared datasets are considered crucial KPI for the success of the solution. Additionally the operation of Interoperability Center will be will be secured by the employment of persons with new advanced digital skills.

Solution 2 maturity

The proper and efficient operation of the Open Data platform presupposes the creation of a sufficient number of technical and functional requirements reports. A significant KPI is the number of datasets integrated in the Open Data platform and as a result the number of new applications created. Also, the number of citizens using the open datasets (e.g. GIS) is considered equally important.

Solution 3 maturity

The number of people in the public and private sector who will take up the opportunity to gain specialist digital skills through leveraging actions of reskilling and upskilling is considered a significant KPI. In addition the annual number of datathons / hackathons mainly attended by young people plays an important role. The creation of new curricula is an additional measurable KPI.

Assessment of activities - progress against KPIs

	Where we started	Midway through the challenge	Final results
Solution 1: Interoperability Center of the Municipality of Patras			
1 KPI 1: Existing smart subsystems (infrastructure and services) of the Municipality of Patras to be integrated in the Interoperability Center	23	23	23
2 KPI 2: Smart subsystems (under development) of the Municipality of Patras to be integrated in the Interoperability Center	8	12	15
3 KPI 3: Employees of the Municipality of Patras with digital skills who will be involved in the operation of the Interoperability Center	0	2	2
4 KPI 4: Annual cost for the operation of the Interoperability Center (~ 80,000) and for future development (~150,000)	0	230,000	230,000

Assessment of activities - progress against KPIs

	Where we started	Midway through the challenge	Final results
Solution 2: Patras Open Data platform			
1 KPI 1: Investigate existing Municipal and non Municipal platforms	3	5	8
2 KPI 2: Definition of technical requirements, Technical feasibility /Implementation (data types, governance structure)	None	Parsely completed	Completed
3 KPI 3: Annual cost for the operation the Open Data Platform (~80,000)	0	80,000	80,000

Assessment of activities - progress against KPIs

	Where we started	Midway through the challenge	Final results
Solution 3: Reskilling – Upskilling			
1 **KPI 1**: Establishment of Reskilling – Upskilling Academy	None	Basic features	Completed
2 **KPI 2**: Review academic – research – business collaborations and their existing curricula	5 academic and research Institutes	5 academic and research Institutes	5 academic and research Institutes
3 **KPI 3**: Funding for the development of the Academy	0	200,000	200,000
4 **KPI 4**: Annual cost of the Academy	0	250,000	250,000

Assessment of city ecosystem

✓ The local ecosystem responded actively. All academic and research actors agreed to participate in the informal Steering Committee, which is a forum to discuss strategic orientations, exchange information on existing and new projects. The business sector is involved via the representation of the Patras Science Park.

✓ At this stage the interaction between the business community, the local administration and the academic sector is already in action.

✓ The three suggested solutions aim at further enhancing and making more effective the links within the ecosystem, in particular through the cooperation of companies for the exploitation of open data provided by the Municipality and the Open Data Platform as well as through connections created by the training courses.

✓ In fact, local ecosystem actively contributes to the three selected solutions:

- In S1 academic stakeholder contribute to the specification of the Interoperability Center.
- In S2 effort will be placed for existing datasets of the local ecosystem coming from public and private stakeholder to open.
- In S3 the establishment of the Skills Academy will exploit existing curricula of academic research stakeholders of the local ecosystem.

Assessment of activities - discussion

Solution 1 activities

There is a remarkable number of subsystems (infrastructure and services) of the Municipality of Patras that will be integrated in the Interoperability Center concerning smart thematic areas (mobility, energy, environment etc.). Besides them additional smart subsystems are under development that will also be included for integration. The human resources and the annual cost are two significant KPIs for the operation of the Interoperability Center.

Solution 2 activities

The number of existing municipal and non municipal platforms that will feed with data the Open Data platform is considered as an input KPI. The detailed definition of technical requirements including data types and governance structure and the annual cost are two significant KPIs for the operation of the platform.

Solution 3 activities

The funding resources and the establishment procedures of the Reskilling – Upskilling Academy are considered crucial KPIs. Investigating existing curricula already developed by the academic and research institutes is also considered a useful indicator for success. The annual cost of the Academy is also a non-ignorable indicator.

5 key lessons

Lesson	Reflections
1	There is abundant but scattered knowledge and infrastructure in the local actors; projects like ICC are necessary because they enhance synergies.
2	Voluntary contribution by individuals increases the likelihood of success of ICC, overcoming inertia of the formal organizations.
3	There is a huge difficulty to inspire the local system if it depends entirely on external funding.
4	Data is important for the city enhancement. Open Data is even more important to the end of providing new services to the ecosystem, which local stakeholders are embracing.
5	Inputs of experts are valuable and their selection process needs to be flexible to account for the needs of the cities

Reflections on city collaborations

- The emergence of the COVID pandemic throughout ICC did not facilitate city interaction to the extend that this was anticipated. Organized ICC City Labs provided a good alternative given the circumstances but could not fully substitute the networking merits of physical meetings.
- Patras is open for collaborations with other cities, sharing common interests and having similar needs, in the context of ICC2 and exploiting funding opportunities for common projects e.g. in Horizon Europe.
- From the ICC experience, it turns out that several cities in Europe share similar needs with Patras especially related to the three solutions pursued by the city: interoperability among verticals, open datasets, and necessary upskilling. City of Patras approach seems similar to the approach followed by other ICC cities.
- Geographical charter for Greek ICC cities is considered quite important to enhance collaboration among Greek cities, that further to common needs, operate under the same legal and regulatory framework. Common solutions could help achieve economies of scale and increase overall effectiveness, exploiting different funding sources e.g. RRF, National Operational Programmes.

Commitments

Commitments to on-going resources	Commitments to on-going collaboration	Commitments to on-going KPIs
• Commitment of funding related to Patras three envisaged solutions from different sources, including Regional Operational Programmes, and RRF. • Further commitment of the city to exploit funding opportunities in the period 2021-2027 towards ascertaining the necessary resources for the implementation of ICC envisaged solutions. • Commitment of the city team to contribute to the city vision and ambitions.	• Commitment of the local ecosystem through the establishment of an informal Steering Committee led by the city of Patras. • Collaboration of the local ecosystem in the context of implementation of the three ICC envisaged solutions contributing relevant know-how, expertise and resources. • Commitment for collaboration with other ICC cities and ICC Greek cities to the end of addressing common needs.	• Commitment of the city of Patras and the local ecosystem to implement the three envisaged solutions towards and beyond the stated KPIs, contributing to the city ambitions and vision. • Commitment of the Steering Committee to review yearly progress of cross cutting KPIs and suggest mitigation measures in case of deviations.

3 Year plan – ambitions

Building on the ICC, what would will the city aim to achieve in 3 years time?	Patras is aiming to become a smart digital city exploiting innovative technologies for the benefit of the citizens, professionals and businesses. Towards this scope the city has put together the Patras Smart City Strategic Plan, with very well defined objectives, descriptive activities and elaborative workplan in several vertical smart areas (energy, mobility, environment, civil protection, network infrastructure etc.). The majority of the solutions will be funded from RRF, while the rest of them have already a design maturity and will have a funding opportunity through ESIF 2021 – 2027. Two of the ICC priority solutions (Interoperability Center and Open Data platform) are currently being included for funding by RRF and will be implemented within the next 3 years.
What steps will you take over the next 3 years to achieve these goals?	Patras Smart City Strategic Pan illustrates the exact activities that are required for the implementation of the solutions, the municipal and non municipal resources that are required. The city will also continue the stakeholder engagement activities stemming from the ICC involvement. These together with the funding sources that have been identified and the support of the local ecosystem based mainly on the continuous activation of the ICC Steering Committee, the city of Patras will ensure that the work that has started within ICC will flourish into a digital platform that will be used for the benefit, growth and well being of the city stakeholders.

3 Year plan – targets

KPI	Category	What commitments will the city make to this end?
1 Number of open datasets to be available for exploitation by any stakeholder (cross cutting)	City Performance	Confirmed funding for the implementation of the Interoperability Center and the Open Data platform from RRF
2 Number of additional smart city datasets to be integrated in the Interoperability Center (S1)	City Performance	Collaboration between Municipality and local stakeholders (academy and research institutes, public stakeholders, chambers, hubs, etc.)
3 Number of technical and functional requirements Reports (S2)	Solution maturity (S2)	Confirmed funding from Regional Operation Program for technical and operational specifications of the Interoperability Center including the requirements of the generated open datasets
4 Existing smart subsystems (infrastructure and services) of the Municipality of Patras to be integrated in the Interoperability Center (S1)	Activity (S1)	Commitment to implementation of detailed technical and operational specifications by the municipal staff
5 Review academic – research – business collaborations and their existing curricula (S3)	Activity (S3)	Collaboration between local stakeholders through the continuous activation of the ICC Steering Committee

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Appendix

Patras : Additional information

ICC Transformation

February 2021 to May 2021

European Commission | The Intelligent Cities Challenge is funded by COSME, the EU programme for Competitiveness of Enterprises and SMEs

City Needs: State of the city – detailed analysis

Higher performance areas

Key insight	Data points	Interpretation	So what?
Availability of digital knowledge, excellent academic performance and pilots	Academic ecosystem of 3 Universities, 3 Research Centers / Institutes with strong profile in technology / ICT / digitalization. Universities present in the city rank 4th, 12th and 18th in Greece. (https://webometrics.info/en/Europe/Greece%20) Universities and research centers present in the city rank with reference to number of projects and attraction of funding in places 2, 6, 7, and 40 among Greek stakeholders. (http://www.researchranking.org/index.php?action=country&country=GR&year=2019)	The University of Patras has been founded in 1964 as a University with predominant technological focus attracting staff from the Greek diaspora abroad and mainly the US. This led to an excellent standing that helped attract talent in the area providing education of high level and performing world level research. The Hellenic Open University and the University of Pepolonnese are later entries in the local ecosystem building on the strong academic profile of the city. Similarly the Industrial Systems Institute / Athena Research Center, Computer Technology Institute and Foundation of Research and Technology complete the local thriving academic ecosystem. There exists though a digital divide between the academic / research and the local fabric of businesses and local population, yet this might be viewed as an opportunity as well.	The city acknowledges the importance of the local academia / research and this might be a source of improvement of the city. For instance sense.city platform for problem reporting in the city has been developed and provided for free to the city by the University of Patras. The presence of academia / research in the city is significant for the attraction of talent and for driving the city to the forefront of technological evolutions. It is sure a key area of prioritization for the city and for the ICC strategy as proven by the presence of academic stakeholders in the different workshops / events associated as well as the anticipated contribution to development of the envisaged city solutions.

City Needs: State of the city – detailed analysis

Higher performance areas

Key insight	Data points	Interpretation	So what?
Emerging ecosystem of ICT companies	An emerging ecosystem of innovative SMEs with strong technological focus and target on ICT is present in the city. The ecosystem comprises a couple of dozens companies employing less than 20 people, with a few larger companies and design centers of ICT multinationals being also present in the area. There is strong interest for start-ups and spin-offs out of the academic and research world that supplements this trend. Furthermore, some clustering efforts are also present as for instance the mi-cluster in the area of micro/nanoelectronics (https://www.mi-cluster.gr/en/)	The ICT-related ecosystem is a result of a historic coincidence: a small local start-up exploiting local talent was acquired by a multinational and as a subsidiary grew to a 120 employees R&D lab. When the mother company seized operations in most European countries, 120 excellent engineers, trained in business found themselves in Patras unemployed but with generous legal termination indemnity. The result was the creation of about a dozen companies in the broader ICT sector, many of which survived. The local ecosystem provides them with human resources in engineering. The share of the local ICT ecosystem in the overall production is low with the majority of companies being traditional SMEs and in need of elementary digital skills.	The city could probably influence the further development of the ecosystem by providing testbeds for new products and services in its urban fabric. This can allow the further development of the ecosystem, by empowering existing companies and allowing the birth of new ones. This would be significant in terms of the overall development of the city as well as enhancement of entrepreneurship, employment and attraction of talent. The prioritized solutions in the context of ICC related to the city interoperability center and open data platform could help enhance the emerging ecosystem of ICT companies and amplify the overall trend.

City Needs: State of the city – detailed analysis

Higher performance areas

Key insight	Data points	Interpretation	So what?
Increasing project funding opportunities through national and EU funding	The city ecosystem has a strong record in the attraction of funding with a large number of projects funded by national and EU sources. Out of the ecosystem, the Universities and research centers present in the area appear to have the highest ability to attract funding ranking with reference to number of projects and attraction of funding in places 2, 6, 7, and 40 among Greek stakeholders. (http://www.researchranking.org/index.php?action=country&country=GR&year=2019)	It is evident from the ranking of academic and research stakeholders in the ecosystem that there is high research and development potential in the area. This matches the public stakeholders that play a crucial role in determining policies including the Region of Western Greece and the Municipality itself. The upcoming programming period is characterized by a number of EU policy priorities that strongly affect cities including Next Generation EU, European Green Deal, Europe Digital Decade, prioritization of Social Market Economy. In this context, upcoming funding opportunities are appropriate for cities to become greener, more digital and more inclusive, through innovation and cutting edge technologies.	Collaboration between the city and the overall ecosystem in the area is appropriate so that funding is attracted and new projects are implemented at city level. To this end the city can facilitate end exploit the overall effort of the entire ecosystem and benefit out of it. This would be quite significant in the effort to lead to more sustainable and digitalized cities that would offer intelligent services to its citizens. ICC can significantly help to this end, through its guidance in undertaking specific development actions and enhancing collaboration among cities. Enhancement of city profiles through ICC external expertise is also significant to this end.

City Needs: State of the city – detailed analysis

Higher performance areas

Key insight	Data points	Interpretation	So what?
Increasing stakeholder interest for collaboration	The city ecosystem is already collaborating in different pilot projects with reference to a number of sectors including ICT Infrastructure, Environment, Energy, Waste Management, Tourism and Culture, Health, Transport and Mobility, E-government, Economy and Development. The data from the projects uploaded on the DCC/ICC initiated city portal of existing project proves that different stakeholders coming from academia / research and business world seek synergies among them and with public administration (Region of Western Greece, Municipality of Patras) in order to develop new projects, products and services targeting the general public.	The overall need for collaboration arises from the fact that there is a need for a critical mass in order to succeed in research and development and have tangible results. Talent attracted in the area is limited due to the brain drain affecting Greece as a whole and the Region of Western Greece in particular. To this end there is no luxury of lack of collaboration among stakeholders. This is something that gradually is being understood, living aside silo practices and being more open to collaboration. This trend is gradually penetrating also beaurocratic behaviours that still exist in public administration and could result in significant consequences for the overall area.	Collaboration among ecosystem stakeholders is quite significant as it can produce the necessary critical mass for real change in the area. The city is acknowledging this fact and as a proof it lead the ICC initiative in the area contributing heavily in bringing all stakeholders around the same table and facilitating collaboration. To this end definition of an ICC Steering Committee as a body enabling the governance among the different stakeholders is quite significant. Participation in ICC workshops and development of a common view with reference to challenges and solutions for the city proves that ICC can help and foster ecosystem collaboration.

City Needs: State of the city – detailed analysis

Higher performance areas

Key insight	Data points	Interpretation	So what?
Local Digital Hub	The local ecosystem in the city has enrolled into an effort to establish a European Digital Innovation Hub. All academic / research stakeholders in the area, public administration and business representative organizations participate in this effort, providing an apt proof of collaboration among them. The effort has been shortlisted in the first round and REBRAINWG (https://www.rebrainwesterngreece.gr) is in the process of drafting the 2nd round proposal.	The effort behind the proposal for REBRAINWG has started as an initiative of the Green Ministry of Labor and Social Affairs and the Region of Western Greece to map a national initiative REBRAINGREECE to the peculiarities of the Region of Western Greece. Around these two core partners the rest of the ecosystem signed a relevant Memorandum of Understanding for the establishment of a European Digital Innovation Hub, building on top of the experience in the area and on the existence of a fully functional Digital Innovation Hub (https://dih.esdalab.ece.uop.gr/). The effort is expected to have significant consequences in the area upskilling / reskilling the local fabric and offering advanced services in AI, Cybersecurity and HPC.	The establishment of a European Digital Innovation Hub in the area of Western Greece will have a significant impact for the area allowing the empowerment of the local ecosystem. Special emphasis is placed in upskilling / reskilling for the area so as to increase the overall employability and as a mitigation for the pandemic risks. To this end ICC solution for upskilling / reskilling has been prioritized. The city recognizes that synergies with the local digital hub can offer successful synergies to this end.

City Needs: State of the city – detailed analysis

Lower performance areas

Key insight	Data points	Interpretation	So what?
Citizen participation	Citizen participation in the city of Patras can be significantly enhanced. There is participation of the local population and general public in different activities at city level, yet this is not regarded adequate and has to be enhanced. This is true even for highly innovative city problem reporting platform (https://patras.sense.city/) offered by the University of Patras, although a significant number of problems is reported through it to the city authorities. Since 1/1/2021 until 31/12/2021 a total of 4719 citizens' requests were reported to the platform. The categories with the most requests are: cleaning, lighting, pavement /road /square and gardening.	Citizen participation is in general a critical factor for altering cities for the better. This involves both the participation of citizens in a context of participatory approaches for policy development, their utilization of offered city digital services and their utilization as sensors in the context of sensing and citizen science scenarios. Smart devices and apps make more active citizen participation possible despite the absence of digital skills by a percentage of the population. A critical factor or the citizen involvement is the belief that their participation can have a real effect.	The city has taken efforts towards more active citizen participation. Yet, a more focused awareness approach is probably needed and a breakthrough in beaurocracy is essential. Involvement of the citizens is regarded quite significant so that democracy in the decision making is enhanced and the voice of the people is heard. To this end advanced apps promoted through the interoperability center and open data platform solutions proposed in the context of ICC can make a difference.

City Needs: State of the city – detailed analysis

Lower performance areas

Key insight	Data points	Interpretation	So what?
Low digital literacy in the business sector	The state of digital maturity in Western Greece is low with reference to the Greek average. More specifically 82% of companies have an internet connection compared to 85% overall in Greece, and 40,7% have a web site in comparison to 59,3% overall in Greece. Only 17% use ICT in areas such as production, sales and marketing, with the largest use recorded in the service sector (27,4%). Companies in the Region that have undergone some technological upgrade in the past 2 years amount to 25.2% concerning hardware and software services. Needs of the companies are related to electronic invoicing (35,3%), website (33,5%), electronic transactions (21,6%) and e-shop (33,9%). All above figures refer to pre-Covid situation.	It is obvious that there is a digital divide between the academic / research world and ICT ecosystem in the city of Patras, and the large part of the economy with reference to digital literacy, as a large percentage of companies are in need of elementary digital services. To this end there is a need to upskill the city business world and help in the process of creating the digital literacy missing. The pandemic situation offered the opportunity to revisit this problem and resulted in enhancing digital literacy for many companies.	It sounds like a paradox to have low digital literacy in an area that has as a strong point the emergence of an ICT ecosystem and the existence of significant academic and research institutions. To this end there is a need of a spill over effect to help bridge this digital divide. This would be significant for enhancing the business world in the city and the Region more widely and help become more competitive. Efforts like the planned digital innovation hub can help to this end, as well as prioritized solutions for reskilling / upskilling in the context of ICC.

City Needs: State of the city – detailed analysis

Lower performance areas

Key insight	Data points	Interpretation	So what?
Limited opportunities to scale up pilot experiences	Different pilot projects are being / have been implemented in the city of Patras with reference to different sectors. For instance with reference to energy saving / efficiency in buildings there are projects targeting public buildings funded under different initiatives and focusing on a number of public buildings, schools etc. Yet it seems that the scale up of the project which mandates significant budget is not as easy. A possible reason for this is that pilots are viewed as a way to showcase, test and evaluate specific technological solutions and break throughs, and to this end are easier to attract funding.	Scaling up pilot experiences has several difficulties. The most important is to safeguard the necessary funding. It is usual that pilot experiences are of a test and evaluation nature, and may be developed by different stakeholders – academic / research, business, public. To this end there is a need after their completion for their result to find their way towards investment priorities at regional, national or EU level, or utilizing private investment. With reference to city related projects, beaurocracy may pose barriers to this process.	The problem of not being possible to scale up pilot projects is quite important for the city that is seeking solutions to this end. Possibly the ICC could offer guidance and expertise on how to deal this situation in an optimal way.

City Needs: State of the city – detailed analysis

Lower performance areas

Key insight	Data points	Interpretation	So what?
Lack of own resources at municipal level	The city is facing difficulties in allocating the right resources at municipal level. This is due to the need for organizational change at city level and involves also bureaucracy, political will and incentivizing the city staff.	The city is aware of the lack of resources that could help enhance digitalization and improve the overall procedures and competitiveness of the city. The issue has far reaching consequences and is affecting different areas of city operation.	The city does not have ready solutions for this problem that is due to a situation accumulated over the years. It is yet recognized as quite significant for the city that has to be improved. There is a political decision for the implementation of an Interoperability Center for the city of Patras in the context of ICC. This Interoperability Center will function as a separate entity in the context of the city and is expected that it will safeguard the needed resources for its efficient operation.

Bottom-up perspectives: stakeholder views

According to Mentimeter results during the Need Assessment Workshop, the following issues were identified by local stakeholders:

- Patras lags behind in terms of the Green Economy, Government Services and Social Connectivity, Economic Growth and Skills, Transport and Urban Infrastructure. Weaknesses are visible in the sub-categories of Mainstreaming CE, Waste reduction, Wireless internet access, Public participation in policy making, Sustainable tourism, Unemployment, Traffic congestion and Participatory urban planning.
- The city is relatively more developed in Natural Environment, Health and Safety, notably in the sub-categories of Water supply, Quality of surface waters, Public security and Access to health services.

The stakeholders are open to cooperate with local enablers mainly in the Green Economy and Local Green Deals, Citizen participation and Digitisation of Public Administration, Upskilling and Reskilling, Green and Digital Transition in Tourism, while there is less interest in Supply chains, Logistics and the Economics of Mobility (11% interest only).

Bottom-up perspectives: stakeholder views

Stakeholders considered the following ideas as worth pursuing:

- Creation of a platform for open data is a priority.
- Creation or use of existing applications for facilitating citizens, businesses and entrepreneurs, local and non-local.
- Creation of an interoperability model in order to ensure the viability of the applications created/used. Collaboration with cities that have already created such a model would be beneficial.
- A generic methodology should be the setting up a small pilot in collaboration with the university, local agencies and companies for testing applications in real conditions and improving them through cooperation. Finding the pros and cons in advance so that there are not interoperability problems.
- The Reactivation of the Steering Committee created under DCC will benefit ICC.

In addition reservations were expressed:

- Pilot projects, which deliver useless services to citizens or businesses should be discontinued.
- The Municipality of Patras itself is expected to take a more pro-active stance. There are opportunities that already exist, which can be deployed without further funding needs.

Assessment of city progress: S1 - Interoperability Center of the Municipality of Patras

What has worked well during this cycle? What is the impact you are proud of?

- The intention of the Municipal Authority to implement the Interoperability Center of the Municipality of Patras
- The number (8) of existing vertical smart city platforms and those (12) designed to be implemented in the near future

What are the main lessons you learnt?

- The Interoperability Center is state-of-the-art technology for the combined utilization of smart platforms
- The control and monitoring of smart infrastructure and services through a single dashboard has caught the attention of several cities

What will you focus on in the next cycle?

- Definition of the technical and functional requirements
- The conditions for interoperability with the future open data platform
- Data correlation scenarios for exporting new data to support decision making

What are they key areas you would be keen to learn from the experience of other cities?

- Operational model of an interoperability center (staff, housing, …) and staff skills
- Technical requirements for the integration of smart platforms (open API, open data, …)

Assessment of city progress: S2 - Open Data platform for the City of Patras

What has worked well during this cycle? What is the impact you are proud of?

- Investigation and listing of existing data platforms in Patras
- Understand the application areas and existing dataset types
- Synergies and best practices from other Cities with respect to opening data

What are the main lessons you learnt?

- Quality and data structure is very important
- Governance and policy of open data at national and European level is crucial
- Interoperability between various platforms is important

What will you focus on in the next cycle?

- Definition of Types of data / structure
- Data Governance structure definition
- …
- …

What are they key areas you would be keen to learn from the experience of other cities?

- Policies with respect to open data
- Best practices
- Citizen and researcher engagement schemes
- …

Assessment of city progress: S3 – Reskilling – Upskilling for the City of Patras

What has worked well during this cycle? What is the impact you are proud of?

- Investigation of existing / upcoming opportunities for funding the solution
- Investigation of existing skills related material / activities at European level that could be utilized (e.g. European Interoperability Framework for Smart Cities and Communities, Living-in.eu)

What are the main lessons you learnt?

- Collaboration and synergies have to be exploited at EU level as there is ready to use material for the Upskilling – Reskilling solution
- Collaboration of the regional ecosystem and exploitation of available mechanisms established by academic / research stakeholders is critical

What will you focus on in the next cycle?

- Aligning with the local ecosystem towards specific calls: call for EDIHs expected to close in Feb 22, upcoming Erasmus calls, other initiatives at regional level

What are they key areas you would be keen to learn from the experience of other cities?

- Targeted groups of the city ecosystem where upskilling matters the most and can have the greater impact
- Targeted digital skills that can have the greatest impact for the city and the overall ecosystem
- …