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1 Executive Summary

This document describes the strategy Deloitte will follow when creating the EPIC Roadmap and is the deliverable D6.1 for Task 6.1 as part of Work Package 6.

We start with introducing Cloud Computing, the European Project for Intelligent Cities (EPIC) and the objectives of the EPIC roadmap in Chapter 2.

In Chapter 3, a proposed long term vision for EPIC is described which is used as the main target in the strategy for the development of the EPIC roadmap. In Chapter 4, the strategy for the development of the EPIC roadmap is described in detail, starting with a discussion on the key assumptions and scope followed by the development actions and the conceptual structure of the EPIC roadmap. Chapter 5 gives a base EPIC roadmap which can be used by the pilot applications to kick-start their development.

In Annex I, the abbreviations used within the document are listed and described. In Annex II, a high-level planning is provided from the perspective of WP6 including the integration with other work packages.
2 Introduction

Within the European Union, administrators of cities are confronted with serious challenges that affect their economies and their abilities to deliver core services to their citizens and to local businesses. They are faced with the harsh realities of swelling city populations demanding more services in contrast with an aging infrastructure, declining budgets and increasing threats. Recent developments in cloud computing technologies, applications and processes provide European cities with opportunities to deliver innovative user-centric public services to citizens and businesses.

The recent trend of Cloud Computing is defined as the consumption of technology, services, software, etc. via the internet rather than operating software and hardware that you buy and install on your computer. It delivers IT-based capabilities as a service rather than as a product, whereby shared resources, software, and information are provided to computers and other devices as a utility over a network (typically the Internet). Today, city administrations are looking at cloud computing as a way to acquire new capabilities more quickly, with less investment upfront, in order to cope with the challenges. Because cloud computing can have a broad impact on an organisation’s business models, operating principles, processes, technology and organisational structures, a holistic approach should be taken for the development of a cloud computing strategy.

The European Platform for Intelligent Cities (EPIC) project aims at creating the first truly scalable and flexible pan-European platform for innovative user-centric public service delivery by combining innovation ecosystem processes, fully researched and tested eGovernment service applications with a new cloud computing paradigm.

The EPIC project will encourage city administrations / decision-makers and Small and Medium Enterprises (SMEs) to take up the EPIC platform approach through the adoption of a practical, business-tested roadmap for implementation. In addition, a catalogue of innovative services and solutions (such as smart electricity, water and transport grids) can help European cities to upscale from the Living Labs environment in designing specific services and solutions for real-life urban deployment.

One of the major outcomes of the EPIC project is the development of a business focused roadmap to be used as a guide for a pan-European exploitation of EPIC. The roadmap will cover the important aspects of EPIC and will describe the required steps for a successful adoption of EPIC by European cities (i.e. city administrations) and SMEs, including possible strategies, business cases, business models and key building blocks (such as identity, security, multiple-modal access and authentication).

The EPIC roadmap aims to achieve the following objectives:

- Detail the fundamental principles involved in becoming a Smart City
- Provide a comprehensive project management framework for European cities to adopt EPIC to become smarter

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1 See definition on Cambridge Dictionaries Online (http://dictionary.cambridge.org/dictionary/business-english/cloud-computing?q=cloud+computing)
• Describe working business models for city administrations and SMEs, including criteria for partnership selection as well as contract management and intellectual property rights (IPR) related issues
• Outline best practices for organisational change and stakeholder management
• Elaborate on the requirements and process elements for offering user-centric innovative public services
• Elaborate on the value, usefulness, accessibility, and security of information assets
• Detail the approaches and building blocks for designing, developing, testing and operating the technical systems and services

The EPIC roadmap will include a deployment guide that indicates how a Smart City can transform and evolve eGovernment and other services and deliver them through the EPIC city portal, which is reflected in the overall vision.

“To be the first choice service innovation and delivery platform (with Roadmap) for medium sized (50,000–500,000 habitants) cities across Europe, where any city can cost-effectively share, access and adapt a range of services to work smarter to meet the needs of most, if not all, their citizens, visitors and a wide range of business/social relations”. ³

In this document, the strategy for the development of the EPIC roadmap within the EPIC project is described in detail and will be based on the defined long term vision for EPIC.

³ See Deliverable D2.1 Project Vision
3 Proposed Long Term Vision for EPIC

The European Platform for Intelligent Cities (EPIC) delivers a validated cloud computing-based platform for the provision of smart eGovernment processes as a service and an accompanying roadmap which cities across Europe will be able to use to become smarter. Unlike a typical cloud infrastructure platform (which is normally just a collection of virtualized servers and storage), EPIC is primarily driven by the need to govern business rules and security and authentication protocols – making it easier and more efficient for public administrations to harness the innovative potential of Living Labs and other eGovernment advancements across Europe to deliver state-of-the-art public services on a pan-European scale. [1]

EPIC wants to be a European ‘innovation ecosystem’ that provides an extensive range of opportunities to deploy sustainable, user-centric services for citizens and businesses in order to enable European cities in becoming smart. The two main target groups for EPIC are (1) Cities and their Living Lab partners and (2) Citizens and Businesses either located in or visiting a City. User-centric open innovation, connected smart cities and web services are combined in EPIC in the following manner:

1. Partner Living Labs engages citizens and SMEs in the innovation process to help drive creation of the type of standard-based web services that citizens, businesses and city visitors want and are potentially willing to pay for,
2. Partner cities will work to plug existing and new co-designed web services into EPIC so that other cities can connect to the platform, discover and use them,
3. Partner consultants and subject matter experts can use findings from pilot trials to help refine the roadmap that incorporates a variety of differing business models from open source, to pay per use and licensing models.

The primary focus of EPIC is promoting smart eGovernment services through the use of a Smart City services catalogue. This catalogue enables cities to find, select and offer already developed web services or select the web services they need in the innovative creation of new ones. A smart city portal is hosted through which end-users will consume the smart eGovernment services that are being developed.

The value of EPIC for the different stakeholders could be described as follows:

- **City Administrations:** Through the roadmap, EPIC breaks down existing barriers by enabling city administrations to obtain IT services in very small increments and with flexible conditions (i.e. on a pay-as-you-go basis). The ability to buy IT services in smaller increments could potentially help all administrations, but will be especially beneficial for smaller cities. The EPIC model allows for cloud consumption models to enable access to IT solutions that would not be otherwise economically possible.

- **Small and Medium Enterprises (SMEs):** The EPIC platform can offer several advantages for SMEs that develop commercial web services. EPIC bears an immediate value proposition not only for the SMEs in the consortium, but to all SMEs within the Smart City portfolio. Because EPIC offers easy and low-impact/cost on-boarding and integration services as well as provisioning and orchestration for
various tools and capabilities it can provide otherwise unaffordable benefits for SMEs. In particular, EPIC eases the go-to-market path for SMEs as the cloud web services platform virtualises the underpinning infrastructure, management framework and governance policies for security and regulatory compliance which apply in the network-enabled, cross-domain and cross-border environment.

- **Citizens:** The citizens living in or visiting the City will gain from accessing more innovative, user-centric, efficient and effective services through the smart city portal in EPIC. Even citizens can drive the development or provision of specific smart eGovernment services in Smart Cities.

The primary focus of the EPIC project must be on the hosting support of smart eGovernment services, and not on the creation of web applications or device-specific applications or ‘apps’. Therefore, it is necessary to create a limited number of web services in the context of the pilots to demonstrate how such smart eGovernment services can be developed and consumed in EPIC.

The EPIC project will have three definite outcomes:

**Outcome 1: EPIC Infrastructure**
- A tested prototype for a pan-European web service delivery platform and Internet of Things (IoT) extensions

**Outcome 2: EPIC Smart City Services Catalogue**
- Three web services (pilots) extending to the private sector and to citizens
- A template service catalogue, where other SMEs can leverage on, in order to offer their services to the city administrations

**Outcome 3: EPIC Roadmap**
- A deployment roadmap that shows how a Smart City can transition to web-based services and cloud computing
4 EPIC Roadmap Development Strategy

The objective of this chapter is to describe the overall strategy for the development of an EPIC roadmap. This roadmap development strategy should ensure that the EPIC roadmap accounts for all the aspects of the roadmap development and implementation. A structure is defined for the EPIC roadmap that will help to organise the development of the different aspects (i.e. guidelines, activities, deliverables, etc.) to be included in the final roadmap. Furthermore, based on this structure, the level of detail and the width of the material can be iteratively developed.

In the following sections of this chapter, the details of the EPIC roadmap development strategy are described, including the following elements:

- Key assumptions
- Scope for the EPIC roadmap
- Detailed strategy for the roadmap development
- Conceptual structure for the EPIC roadmap

Based on the conceptual structure for the EPIC roadmap, a base EPIC roadmap is already provided in the next chapter.

4.1 Key Assumptions

The key assumptions for the development of the EPIC roadmap are the following:

- Assume an existing functional web service delivery cloud platform to exchange information and applications for intelligent city services.
- Assume sufficient information can be received from the pilot applications to complete and test the different aspects included in the EPIC roadmap.
- For the level of detail in the roadmap, the detailed descriptions of the activities and deliverables for the technology implementation are not included. However, in the course of the project, we will integrate the technology focused deliverables of the other work packages into our roadmap.

4.2 Scope for the EPIC Roadmap

The development of a roadmap for EPIC should cover all the important aspects of EPIC and describe all the required steps for a successful exploitation of EPIC for city administrations.

For a particular European city, the roadmap will describe the different phases to initiate the use of innovative cloud computing technologies and to transform public services into smart eGovernment public services, in using the EPIC platform.

Within each of these phases, the roadmap should describe the different aspects (or disciplines) that are important for a city administration to design and implement these smart eGovernment services. Ultimately, the activities, tasks and possible results to be expected for each phase and discipline are described, including both business and technical elements.

The scope for the EPIC roadmap can be described using different aspects, such as the potential stakeholders, the size of the cities to be targeted, the possible business scenarios.
to be supported, the public services supported, and the cloud service models and business models included in the EPIC roadmap. In the following sections, the different aspects of the scope for the EPIC roadmap are described in detail.

4.2.1 Stakeholders for EPIC Roadmap

The EPIC roadmap is targeted towards the public administrations in European cities that develop and provide smart public services to citizens and businesses in order to become a Smart City. Furthermore, local, regional or national administrations could use the EPIC roadmap to interoperate with city administrations in providing public services.

Private businesses (e.g. SMEs) are identified as important stakeholders of the EPIC roadmap because they can use the EPIC roadmap when collaborating with Smart Cities in providing public or private services using the EPIC platform. However, the EPIC roadmap will not be directly targeted towards private businesses and will therefore not include specific activities or deliverables for them.

During the project, the SME’s and cities in the pilots, will have multiple stakeholder roles in the roadmap.

- User: The initial roadmap with templates delivered to them as a guideline on how to execute their tasks.
- Reviewer: The SME’s, together with the cities, will be the first ones who can give feedback on the roadmap and deliverables, to recommend on what works for a city administration and what can be improved.
- Collaborator: Finally we will also use the deliverables completed by the pilots as example deliverables for the future users of the roadmap.

4.2.2 Size of Cities

The size of the city could have an impact on the business models to be used within EPIC or the extensiveness of the EPIC roadmap. The overall vision for the EPIC roadmap is to target every city in Europe, which includes the small cities (e.g. Tirgu Mures) as well as the very large cities (e.g. London). However, the main focus for the development of the EPIC roadmap will be on the medium size cities.

In order to accommodate for the differences in size of European cities, the EPIC roadmap will provide a scaled version of the roadmap targeting both smaller and larger cities accordingly.

4.2.3 Business Scenarios Supported by EPIC Roadmap

The EPIC roadmap should be able to facilitate the provision of public services to citizens and businesses and the provision of public and private services in collaboration with private businesses or other public administrations.

In this section the different scenarios that where identified for the EPIC roadmap, are described from a conceptual point of view. For each roadmap scenario, the relationships are described between the city administrations, the EPIC platform and other relevant stakeholders (e.g. private businesses, national administrations, or other Member State administrations).
The following scenarios are within the scope of the EPIC roadmap and help define the different aspects that should be described in the final roadmap.

If specific activities and deliverables are different or unique for a specific scenario, this will be indicated in the roadmap. Examples are: Business Case development, Deployment Strategy, Contract Management, Risk Analysis...

**EPIC Roadmap Scenario 1:**

In this EPIC roadmap scenario, the city administrations use the EPIC platform to facilitate the information exchange between administrations and increase efficiency and effectiveness of administration’s operations. A conceptual high-level view on the relationships between the relevant stakeholders is provided in the following figure.

![Figure 1 - Conceptual View for EPIC Roadmap Scenario 1](image)

**EPIC Roadmap Scenario 2:**

In this EPIC roadmap scenario, the private businesses provide a private service to citizens and businesses, using the EPIC platform to collaborate and integrate city administration services.

This EPIC roadmap scenario will be covered in the pilot application for the City of Manchester – Smart Environment Service.

![Figure 2 - Conceptual View for EPIC Roadmap Scenario 2](image)
EPIC Roadmap Scenario 3:
In this EPIC roadmap scenario, the city administrations use the EPIC platform to collaborate and integrate administration services in order to provide intelligent public service to citizens and businesses.

![Figure 3 - Conceptual View for EPIC Roadmap Scenario 3](image)

EPIC Roadmap Scenario 4:
In this EPIC roadmap scenario, the city administrations use the EPIC platform to collaborate and integrate private business services in order to provide intelligent public service to citizens and businesses.
This EPIC roadmap scenario will be covered in the pilot applications for the City of Brussels – Relocation Service and for the City of Issy-Les-Moulineaux – Urban Planning Service.

![Figure 4 - Conceptual View for EPIC Roadmap Scenario 4](image)
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EPIC Roadmap Scenario 5:
In this EPIC roadmap scenario, the city administrations use the EPIC platform to collaborate and integrate with other National or regional administrations to provide public services to citizens and businesses.

![Figure 5 - Conceptual View for EPIC Roadmap Scenario 5](image)

EPIC Roadmap Scenario 6:
In this EPIC roadmap scenario, the city administrations use the EPIC platform, integrating with different City administrations from other Member States, to provide cross-border public service to citizens and businesses.

![Figure 6 - Conceptual View for EPIC Roadmap Scenario 6](image)
4.2.4 Public Services Supported by EPIC Roadmap

The EPIC roadmap should be able to support Smart Cities in providing smart public services, to citizens and businesses. In order to understand the challenges of cities in becoming smart and to cope with the objectives of the roadmap, an overview of eGovernment public services for local administrations could be valuable.

Based on the 9th Benchmark Measurement report\(^4\) for eGovernment ‘Digitising Public Services for Europe: Putting ambition into action’, an overview of service clusters for public services is provided in the following figure:

![Figure 7 - Overview of Service Clusters for Public Services](image)

Mainly delivered at national level. Top scores for all countries.

Often delivered at regional and local levels. Least sophisticated cluster but shows good progress.

Covers one-off life events. Average performance and growth.

Comprises frequently used services. Average performance and growth.

The final roadmap will have to be generic enough to support all clusters of public services. In the EPIC project itself, not all service clusters will be addressed.

The three selected pilot applications to be developed within the EPIC project are:

- City of Brussels – Relocation Service (Registration service)
- City of Issy-Les-Moulineaux – Urban Planning Service (Registration service)
- City of Manchester – Smart Environment Service (Income Generating service)

Within the context of pan-European eGovernment services, a typical life-event of a citizen moving from one to another European city is taken as an integrated scenario for the three pilot applications. Only a subset of the full end-to-end process for relocation is chosen for the EPIC pilots to be able to demonstrate the power of the semantic engine and the functionality of the pilot applications.

Finally, the city of Tirgu Mures, Romania will test and validate the EPIC roadmap.

4.2.5 Cloud Services and Business Models for EPIC Platform

The EPIC platform can be used by city administrations and private businesses in different collaborative modes and for different business needs. The different collaborative modes can be described as business models where city administrations and private businesses

collaborate to an extent. The different business needs can be described as the cloud service models which could be provided using the EPIC platform.

For the business models, four categories are defined for the collaboration between city administrations and private businesses, from maximum city responsibility (i.e. City internal sourcing) to maximum private business responsibility (i.e. Privatisation).

- City Internal Sourcing: The processes, people and tools used to deliver services are entirely owned and managed by the government shared-service organisation, which is often a consolidation of people and assets transferred from fragmented organisations. These organisations are public organisations, not part of the open market.
- Public-Private Partnerships: The processes, people and tools used to deliver the services are owned and managed by a joint venture between the government shared-service organisation and by a private-sector partner.
- Privatisation: The processes, people and tools used to deliver the services are entirely owned by the shared-service organisation, but this organisation has been privatized; thus, it fully competes in the open market with information and communication technology vendors.
- Externalisation: The processes, people and tools used to deliver the services are supplied in part, or entirely, by external service providers in the form of traditional IT outsourcing or business process outsourcing, or through alternative service delivery models, such as cloud computing, infrastructure utility or business process utility.

For the cloud service models, four categories are generally defined for cloud computing, including Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), Software-as-a-Service (SaaS) and Business Process-as-a-Service (BPaaS).

- Infrastructure-as-a-Service (IaaS): Cloud infrastructure services deliver computer infrastructure – typically a platform virtualization environment – as a service, along with raw (block) storage and networking. Rather than purchasing servers, software, data-centre space or network equipment, clients instead buy those resources as a fully outsourced service. Suppliers typically bill such services on a utility computing basis; the amount of resources consumed (and therefore the cost) will typically reflect the level of activity.
- Platform-as-a-Service (PaaS): Cloud platform services deliver a computing platform and/or solution stack as a service, often consuming cloud infrastructure and sustaining cloud applications. It facilitates deployment of applications without the cost and complexity of buying and managing the underlying hardware and software layers. At this moment the software itself is still running on the customers’ own computers.
- Software-as-a-Service (SaaS): Cloud application services deliver software as a service over the Internet, eliminating the need to install and run the application on the customer’s own computers and simplifying maintenance and support.
- Business Process-as-a-Service (BPaaS): This service type combines the application elements of cloud computing with a human aspect. The main difference from
traditional Business Process Outsourcing is the fact that the human resources providing the BPaaS service are pooled as well between different clients.

In the following table, the scope for the EPIC roadmap is indicated using the business models and the cloud service models.

Table 1 - Scope of EPIC Roadmap for Business Models and Cloud Services

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<th>Externalisation</th>
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In theory, all these models are possible within the EPIC context. However, the EPIC roadmap will only focus on the BPaaS in a City Internal Sourcing business model and on the SaaS and BPaaS service models in a Public-Private Partnership and Externalisation business model.

4.3 Strategy for Development of EPIC Roadmap

The EPIC roadmap will be developed throughout the entire lifecycle of the project and will show how European cities can sustainably support the transition of eGovernment services and applications to shared European web-based services and cloud computing platforms. The EPIC roadmap will be created by analysing data collected by the project, case study reviews as well as surveys and interviews with key stakeholders.

Developing a roadmap for pan-European implementation includes the following:

1. Ensure city administrations are well informed on the cloud computing concept. Cloud services have suddenly become more mainstream. Lower cost, flexibility, and lesser implementation time lure organisations to opt for cloud computing. Cloud value drivers provide a framework for building better managed organisations and IT strategies. However, concerns about losing control when moving data and services into the cloud continue to make organisations and city administrations wary of cloud computing. In our roadmap, we will make sure that the cloud concept is well understood and provide the necessary explanation of the categories, advantages and disadvantages, adoption and deployment structures, etc.

2. EPIC will disseminate the project findings to other cities administrations / decision makers and SMEs and will encourage them to take up the EPIC platform through
adopting a practical, business-tested roadmap that will help to guide cities in adopting the new cloud technologies, but also new instrumentations such as smart water, electricity and transport grids and be specifically designed to help cities across Europe upscale from the Living Labs environment to real-life urban deployment.

3. Practical focus on working business models, including for example public-private partnerships. In our roadmap, more specific when we focus on the business case, we will investigate the financial implications of these models. For defining the working business models, the participants involved, the technology, the funding and ownership, the vision and policy, the security, accessibility and authorisation are considered.

4. Detect and register stakeholder management best practices: Cities or urban areas are constantly faced with important challenges that necessitate investment in innovative solutions (notably ICT-based) to improve the quality and efficiency of their infrastructures and services. Some anticipate and are leaders in adopting smarter development models. They play also a pioneering role in engaging the user in the innovation process. Building on existing user-centric innovation initiatives in Europe, the aim is to ensure a wider implementation of open platforms for the provision of Internet-enabled services in cities. These platforms should help develop innovation ecosystems accelerating the move towards smart cities and providing a wide range of opportunities for new, higher quality, and sustainable services for citizens and businesses.

5. Develop a truly interoperable eGovernment case concerning a family moving from a city in one Member State to another: By offering a holistic approach to relocating to a foreign city, the family relocation services hopes to solve the following problems: (1) housing: finding a temporal/more permanent place to stay; (2) overcoming the language barrier, and making visible implicit knowledge; (3) streamlining the often tiresome practical government-related duties for a person moving abroad; (4) offer an augmented layer of government and non-government data concerning the city. The two other cases (Urban Planning Services and Smart Environment Services) will add to the Roadmap’s aim to upscale and leverage Living Lab applications into a real life city environment.

6. A deployment guide that shows, among other things, how a Smart City can transition eGovernment and other services to web-based services and cloud computing

Our high-level approach for the development of the EPIC Roadmap consists of the following activities to be performed, as shown in Figure 8.
A high level overview of the input requirements for the development of the EPIC roadmap is provided in the following figure. The three pilot applications are included for the development of an end-to-end relocation scenario, in which a family would like to move from Cologne to Brussels. This relocation scenario includes three phases; a planning, a discovery and a decision phase.
4.4 High Level Planning

There are four main tasks defined for the development of the EPIC roadmap.

Task 6.2 – Stakeholder Interviews and Data Collection

In order to tailor the roadmap to fit the demands of as many cities as possible, this task will focus on collecting valuable end-user/city data from EPIC pilot Living Labs and their users.

This task will be delivered in conjunction with task T2.2 – Stakeholder Requirements / Workshops and will share the end-user requirements data.

Task 6.3 – Creation of Project Management Framework to Become a Smart City

This task will focus on creating a project management framework, freely available for all cities interested in adopting the EPIC roadmap. This framework will show the prospective cities how to manage the process of initiating and running a smart city project.

Task 6.4 – Production of the Functional Roadmap
This task will consist of the actual production of the roadmap based on the material produced in the previous tasks. The roadmap will be delivered as an online tool as well as a brochure that can be downloaded from the project website.

Task 6.5 – Production of Roadmap for Sustainable Implementation

This task will consist of the production of the roadmap for consortium and third parties who want to extend deployment after project end.

Within each task, detailed activities are defined which are performed in close collaboration with other relevant work packages. These tasks and activities will ultimately lead to the main deliverables D6.2 and D6.3 for WP6. The description of these deliverables is provided as follows:

D6.2 Stakeholder Data Repository and PM Framework for Cities

- Data about stakeholder requirements, needs and expectations for the roadmap (in conjunction with WP2 – Users Requirements)
- A comprehensive Project Management Framework for cities interested in implementing the EPIC platform

D6.3 Functional and Business Roadmap

- Functional roadmap for implementation guidance for cities
- A final business oriented roadmap for deployment

A high-level planning of the activities for the development of the EPIC roadmap is provided in the following figure.
Figure 10 - High-Level Planning of Activities for Development of EPIC Roadmap
The objectives of the integration of WP6 with the other work packages are defined as follows. Annex II contains the high-level planning including the integration with the other work packages.

Integration with WP2 – User Requirements

- Requirements defined in WP2 will be evaluated and used as input for base roadmap:
  - used as baseline for our deeper interviews
  - identification and analysis of stakeholders
  - input for expectations towards management framework
- Once the base roadmap is created, we will review the initial requirements to assure all expectations are addressed.
- Once the technical requirements are finalized, these will also be reflected in the final roadmap.

Integration with WP3 – Platform Adaptation

- Technical integration plan (D3.1B) and smart city information architecture and functional platform (D3.2) delivered in WP3 will be incorporated in the final roadmap.
- An interoperability checklist will be created in roadmap and will be cross-checked with WP3.

Integration with WP4 – Service Integration

- Integration of the different services will be the input for the integrated storyboard that will be used as basis for the roadmap creation.
- The testing and review of the implemented services will be an important input to the roadmap.
- Finally the main service parameters (ex. payment structure, technical requirement, geographical scope ...) of a service catalogue will also be integrated in the generic service catalogue WP6 wants to provide based on the results from the survey that will take place in WP6.

Integration with WP5 – Scenario Creation

- Ideally an integrated storyboard will be used to be the basis of the definition of the roadmap.
- The users’ task analysis will be crosschecked with the project management framework in WP6.
- The template deliverables created in WP6 will also be created with completed examples based on the scenarios created in WP5.

Integration with WP7 – Pilot Deployment

- The created base roadmap and the management framework will be used as a starting aid for the pilot deployment.
• The pilots are the test drivers of the roadmap. It is essential that on regular intervals (to be agreed) the roadmap is evaluated.
• The roadmap will be presented and applied as an integrated story board.

Integration with WP8 – Results Validation
• The outcome of the results analysis and validation will impact the final roadmap.
• There will be a regular iteration of the results of WP6 and WP8.

Integration with WP9 – Dissemination & Sustainability
• The communication strategy of WP9 will be integrated in the stakeholder management framework.
• The dissemination material will also be crosschecked with the interview results of WP6.
• The WP9 activities will be the input for the creation of the sustainable roadmap.

Testing of EPIC Roadmap – 3 Pilot Applications
In order to develop and finalise the EPIC Roadmap, it will be iteratively tested with the 3 pilot applications.

End-To-End Process – Relocation Scenario
For a complete evaluation of the roadmap capabilities, the experience gained from the Pilot Applications will lead to the development of a truly interoperable eGovernment case concerning a family moving from a city in one Member State to another. By offering a holistic approach to relocating to a foreign city, the family relocation service hopes to facilitate the following concerns:

• exploring the potential city’s environment,
• finding a temporary or more permanent place to stay,
• overcoming the language barrier, and making visible implicit knowledge,
• streamlining the often tiresome practical government-related duties for a person moving abroad,
• offering an augmented layer of government and non-government data concerning the city, and
• providing smart environment services for the citizen.

This scenario will look at a typical life-event of a citizen moving residence from Germany to Belgium. Only a subset of the full end-to-end process for relocation is needed for the EPIC pilots to be able to demonstrate the power of the semantic engine and the functionality of the pilot applications.

Validation of EPIC Roadmap – City Tirgu Mures (Romania)
The EPIC roadmap will be tested and validated by the City of Tirgu Mures in Romania.
4.5 Conceptual Structure for EPIC Roadmap

Based on Deloitte methods and common project methodologies, a conceptual structure is defined. A high level overview of the structure is provided in Figure 11. In this structure, different phases are defined, including Vision, Plan, Design, Build, Deliver and Operate. Within these phases, different tasks are defined for relevant disciplines and for each task the work products, job roles and development aids (e.g. tools).

![Figure 11 - High Level Overview of Conceptual Structure for EPIC Roadmap](image)

In the following table, the definitions are provided for the different concepts used in the roadmap.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phases</td>
<td>Phases are key groupings of activities that follow a progression through the project life cycle. The project phases include key categories of activities designed to guide, organise, and help facilitate effective execution throughout the project life cycle.</td>
</tr>
<tr>
<td>Disciplines</td>
<td>A discipline is composed of tasks associated with a single subject area. In order to execute all project work by phase it is organised by disciplines, and there are teams responsible for the tasks within each discipline.</td>
</tr>
<tr>
<td>Tasks</td>
<td>A task represents the lowest level in the work breakdown structure. The majority of the method content is accessed from the task, and a discipline consists of multiple tasks.</td>
</tr>
</tbody>
</table>
Work Products  A work product is the end result of each task. Samples and templates are attached to each work product. Tasks can have one or more work products, of which there are three types: deliverable, outcome, and artefact.

Job Roles  Job Roles are the standard project roles defined by the method and aligned with the project estimator.

Development Aids  Development aids include tools and detailed procedures to support the method and expedite or facilitate the process of developing a work product.

Based on commonly accepted project management methodologies, the following phases are identified:

Table 3 - Description of Phases in the EPIC Roadmap

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>Define the business case for the project and develop the project definition, budget and master plan to clearly define the goals, expected benefits as well as the project approach, scope, and key milestones.</td>
</tr>
<tr>
<td>Plan</td>
<td>Plan the project by developing the project management plan, the work plan and deliverables log. The project management plan defines the project organisation, method scope, project tools, and the processes for managing risks, issues, change requests, action items, decisions, deliverable acceptance, budget, timeline, milestones and project status. A quality management plan is defined to address the project’s quality objectives and activities for quality assurance, control and support.</td>
</tr>
<tr>
<td>Design</td>
<td>Create a detailed design and document business requirements, business processes, software configuration, software gaps, change impacts, application security, and technical infrastructure. Perform a proof of concept prototype showing how the business will operate using the cloud computing platform.</td>
</tr>
<tr>
<td>Build</td>
<td>Configure the software based on the design, perform the testing of the system as defined in the test management plan and test approaches, and develop end-user training materials.</td>
</tr>
</tbody>
</table>
Deliver
Prepare for and execute system and business transition to the new environment, which includes conducting user-acceptance testing, performing end-user training, conducting go/no-go evaluations and establishing the support organisation to help the client after transition.

Operate
Transition from the readiness activities of a preproduction environment to actual business operations.

Based on the objectives for the EPIC roadmap, the following relevant disciplines are selected. The different tasks to be performed within each phase are structured and grouped for these disciplines.

Table 4 - Description of Disciplines in EPIC Roadmap

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Management</td>
<td>Provides approaches and assets for effective project management and planning.</td>
</tr>
<tr>
<td>Organisational Change &amp; Stakeholder Management</td>
<td>Addresses adoption and sustainability of the change initiatives. It encompasses an integrated approach to communications, stakeholder engagement and preparation, training, and organisational alignment and transition.</td>
</tr>
<tr>
<td>Process &amp; Requirements Management</td>
<td>Addresses business process design, package software configuration, user requirements definition and management, business process controls, functional testing, and business continuity planning.</td>
</tr>
<tr>
<td>Information Management</td>
<td>Addresses the value, usefulness, accessibility, and security of an organisation's data and information assets. It includes tasks related to data and information requirements, standards, management, and security and controls.</td>
</tr>
<tr>
<td>Technology Management</td>
<td>Defines the approach to design, develop, test, and operate the infrastructure and software components required for the system applications. It addresses the transition to the new applications and includes planning tasks related to business deployment, readiness testing, system deployment, and support preparation and stabilization.</td>
</tr>
</tbody>
</table>
A base EPIC Roadmap is provided in the next chapter. This roadmap will be refined and adapted based on discussions with the relevant stakeholders and on the testing of the roadmap with the 3 pilot applications.
5 Base EPIC Roadmap

In this chapter, a base roadmap is described for the EPIC platform that could be used by cities to initiate an EPIC-triggered project for the provision of smart public services.

An overview of the phases and disciplines for the EPIC roadmap are provided in Figure 12. From the conceptual structure for the EPIC roadmap, each discipline consists of tasks that are performed by specific roles and that produce work products, using specific development aids (e.g. tools). The base EPIC roadmap prescribes a sequential execution of the project phases. Work products resulting from tasks in previous phases can be refined in later phases.

![Figure 12 - Overview of Phases and Disciplines for EPIC Roadmap](image)

For each phase the objective is described and an initial set of key tasks and work products are described per discipline. Next, an overview of the organisation, roles and responsibilities is provided that are involved in the execution of the tasks for the different disciplines and phases.

The tasks and deliverables in these phases are not EPIC specific yet, during the course of the project, each of these phases will receive an EPIC flavour as a result of close collaboration with the pilots and the other teams.

5.1 Vision Phase

In the Vision phase, the business case is defined for the city administrations for the provision of smart public services. The project definition, budget and master plan are developed in order to clearly define the goals and expected benefits, as well as describing the project approach, scope, and key milestones.
5.2 Plan Phase

In the Plan phase, the project management plan is developed for the implementation of smart public services on the EPIC Platform, including the work plan and deliverables log. The project management plan defines the project organisation, method scope, project tools,
and the processes for managing risks, issues, change requests, action items, decisions, deliverable acceptance, and budget and project status. A quality management plan is defined to address the project’s quality objectives and activities for quality assurance, control and support.

<table>
<thead>
<tr>
<th>Key Tasks</th>
<th>Work Products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Management</strong></td>
<td>Develop project management plan, Develop quality management plan</td>
</tr>
<tr>
<td><strong>Organisational Change &amp; Stakeholder Management</strong></td>
<td>Develop Communication Strategy</td>
</tr>
<tr>
<td><strong>Process &amp; Requirements Management</strong></td>
<td>Conduct business process and requirements validation and consensus sessions, Develop use cases based on business requirements, identify the roles required to support the new organisation</td>
</tr>
<tr>
<td><strong>Information Management</strong></td>
<td>Prepare design template, Identify and define potential gaps between desired integrations and system capabilities</td>
</tr>
<tr>
<td><strong>Technology Management</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job Roles</th>
<th>Development Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager, Team Lead, Business Lead, Process Analyst, Change/Communication Specialist, Technology Lead, Integration Lead</td>
<td>Stakeholder management best practices</td>
</tr>
</tbody>
</table>
5.3 Design Phase

In the Design phase, the business requirements are documented and a detailed design for the smart public services is created. In order to create a design, the business processes, software configuration, software gaps, change impacts, application security, and technical infrastructure are taken into account. A proof of concept prototype is developed to show how the city administrations and citizens/businesses will operate and use the smart public services on the EPIC Platform.

<table>
<thead>
<tr>
<th>Key Tasks</th>
<th>Work Products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Management</strong></td>
<td>Follow up project management plan &amp; Budget &amp; Quality</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Organisational Change &amp; Stakeholder Management</strong></td>
<td>Document business requirements</td>
</tr>
<tr>
<td></td>
<td>Create detailed process design for public service</td>
</tr>
<tr>
<td><strong>Process &amp; Requirements Management</strong></td>
<td>Develop data migration approach for loading data into new application, aligned with the deployment of appropriate user groups/roles</td>
</tr>
<tr>
<td></td>
<td>Map data elements between source system and target application – identify inconsistencies and work with business and application team to resolve</td>
</tr>
<tr>
<td><strong>Information Management</strong></td>
<td>Create detailed technology design for public service</td>
</tr>
<tr>
<td></td>
<td>Develop proof-of-concept prototype</td>
</tr>
</tbody>
</table>

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5.4 Build Phase

In the Build phase, the smart public services are implemented using the EPIC Platform based on the design. The testing of the smart public services is performed as is defined in the test management plan. Furthermore, end-user training materials and user guides are developed.

<table>
<thead>
<tr>
<th>Key Tasks</th>
<th>Work Products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Management</strong></td>
<td></td>
</tr>
<tr>
<td>Follow up project management plan &amp; budget &amp; quality</td>
<td>Project management plan</td>
</tr>
<tr>
<td></td>
<td>Project budget</td>
</tr>
<tr>
<td></td>
<td>Quality review</td>
</tr>
<tr>
<td><strong>Organisational Change &amp; Stakeholder Management</strong></td>
<td>End-user training materials</td>
</tr>
<tr>
<td>Develop end-user training materials</td>
<td></td>
</tr>
<tr>
<td>Develop user guides</td>
<td>User guides</td>
</tr>
<tr>
<td><strong>Process &amp; Requirements Management</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Information Management</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Technology Management</strong></td>
<td></td>
</tr>
<tr>
<td>Implement public service</td>
<td>Public service</td>
</tr>
<tr>
<td>Test public service</td>
<td></td>
</tr>
</tbody>
</table>
5.5 Deliver Phase

In the Deliver phase, the system and business transition to the new environment are prepared and executed. This includes conducting user-acceptance testing, performing end-user training, conducting go/no-go evaluations and establishing the support organisation to help the city administrations after transition.

<table>
<thead>
<tr>
<th>Job Roles</th>
<th>Development Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager, Team Lead, Business Lead, Process Analyst, Change/Communication Specialist, Technology Lead, Integration Lead, Application Functional Analyst, Application Developer, Data Analyst, Tester, Training Specialist</td>
<td>Templates for Test Scenario’s and End user Training</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Tasks</th>
<th>Work Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Management</td>
<td></td>
</tr>
<tr>
<td>Follow up project management plan &amp; budget &amp; quality</td>
<td>Project management plan</td>
</tr>
<tr>
<td>Conduct Go/No-Go evaluations</td>
<td>Project budget</td>
</tr>
<tr>
<td>Organisational Change &amp; Stakeholder Management</td>
<td>Quality review</td>
</tr>
<tr>
<td>Perform end-user training</td>
<td>Go/No-Go evaluation</td>
</tr>
<tr>
<td>Establish support organisation</td>
<td></td>
</tr>
<tr>
<td>Process &amp; Requirements Management</td>
<td></td>
</tr>
<tr>
<td>Information Management</td>
<td></td>
</tr>
<tr>
<td>Conduct user acceptance testing</td>
<td>User acceptance tests</td>
</tr>
<tr>
<td>Prepare and execute business transition</td>
<td>Business transition</td>
</tr>
<tr>
<td>Technology Management</td>
<td></td>
</tr>
</tbody>
</table>
5.6 Operate Phase

In the Operate phase, the readiness activities of the preproduction environment are being transitioned into actual business operations.

<table>
<thead>
<tr>
<th>Key Tasks</th>
<th>Work Products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Management</strong></td>
<td>Project management plan</td>
</tr>
<tr>
<td>Follow up project management plan &amp; Budget &amp; Quality</td>
<td>Project Budget</td>
</tr>
<tr>
<td>Perform actual business operations</td>
<td>Quality review</td>
</tr>
<tr>
<td><strong>Organisational Change &amp; Stakeholder Management</strong></td>
<td>Actual business operations</td>
</tr>
<tr>
<td><strong>Process &amp; Requirements Management</strong></td>
<td></td>
</tr>
<tr>
<td>Load required data into production environment to support Pilot launch</td>
<td>Data loaded into production environment to support Pilot launch</td>
</tr>
<tr>
<td>Support Pilot launch and resolve integration defects as required</td>
<td></td>
</tr>
<tr>
<td><strong>Information Management</strong></td>
<td></td>
</tr>
<tr>
<td>Perform actual business operations</td>
<td>Actual business operations</td>
</tr>
<tr>
<td><strong>Technology Management</strong></td>
<td>Deployed / updated pilot application (reflecting test feedback)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.7 Organisation, Roles & Responsibilities

In the course of this project, we will complete the roadmap with roles and responsibilities, and the recommended project organisation to implement smart services in a cloud environment.

In this base road roadmap, an overview is provided of the possible roles that are involved in the execution of the different tasks per discipline. Since not all cities will have the size, budget or capacity to have an extended team, we will also create a minimum project structure in the coming months.

However, if most of the roles will have to be filled in by somebody, one person can take up multiple roles, and not all roles have to be fulfilled by the city administration. (People from the Small and Medium Enterprise team can also be part of the team).

In the following table the main roles for performing the tasks in the EPIC roadmap are provided.

**Table 5 - Overview of Roles for Performing the Tasks in EPIC Roadmap**

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Roles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Management</strong></td>
<td>Project Partner</td>
</tr>
<tr>
<td></td>
<td>Program Lead</td>
</tr>
<tr>
<td></td>
<td>Project Manager</td>
</tr>
<tr>
<td><strong>Organisational Change &amp; Stakeholder Management</strong></td>
<td>Change/Communication Specialist</td>
</tr>
<tr>
<td></td>
<td>Training Specialist</td>
</tr>
<tr>
<td><strong>Process &amp; Requirements Management</strong></td>
<td>Business Lead</td>
</tr>
<tr>
<td></td>
<td>Process Analyst</td>
</tr>
<tr>
<td><strong>Information Management</strong></td>
<td>Integration Lead</td>
</tr>
<tr>
<td></td>
<td>Data Analyst</td>
</tr>
<tr>
<td><strong>Technology Management</strong></td>
<td>Technology Lead</td>
</tr>
<tr>
<td></td>
<td>Technical (Infrastructure) Architect</td>
</tr>
</tbody>
</table>
An example of a typical project organisation model is provided in the following figure.

Figure 13 - Example of Project Organisation
6 Conclusion

After defining the long term vision of the EPIC project, we focus in the Roadmap Development Strategy on the following points: key assumptions, scope of the Epic Roadmap and the development approach.

Based on the above we have created a high level Base Roadmap, which exists of a list of activities and deliverables per phase/discipline. This roadmap also indicates which are the typical project roles involved in this project by phase/discipline.

In the next months the roadmap will become more tangible and extensive, since we will work in close collaboration with the pilots to evaluate the tasks and deliverables, but also provide templates and complete deliverables examples.
7 References

## Annex I: List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPaaS</td>
<td>Business Process-as-a-Service</td>
</tr>
<tr>
<td>DEL</td>
<td>Deloitte</td>
</tr>
<tr>
<td>EPIC</td>
<td>European Platform for Intelligent Cities</td>
</tr>
<tr>
<td>IaaS</td>
<td>Infrastructure-as-a-Service</td>
</tr>
<tr>
<td>ICTPSP</td>
<td>ICT Policy Support Programme</td>
</tr>
<tr>
<td>IOC</td>
<td>Intelligent Operations Center</td>
</tr>
<tr>
<td>IoT</td>
<td>Internet of Things</td>
</tr>
<tr>
<td>IPR</td>
<td>Intellectual Property Rights</td>
</tr>
<tr>
<td>ISV</td>
<td>Independent Software Vendors</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>PaaS</td>
<td>Platform-as-a-Service</td>
</tr>
<tr>
<td>PM</td>
<td>Project Management</td>
</tr>
<tr>
<td>SaaS</td>
<td>Software-as-a-Service</td>
</tr>
<tr>
<td>SCE</td>
<td>SmartCloud Enterprise</td>
</tr>
<tr>
<td>SME</td>
<td>Small and Medium Enterprise</td>
</tr>
<tr>
<td>WP</td>
<td>Work Package</td>
</tr>
</tbody>
</table>
9 Annex II: High-Level Planning with Integration of Work Packages

Figure 14 - High-Level Planning of WP6 with Integration of Work Packages