DELIVERABLE

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Revision History

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Statement of originality:

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1. EPIC Vision Statement

EPIC will deliver a validated cloud computing-based platform for the provision of Smart eGovernment processes as a service and an accompanying roadmap that cities across Europe will be able to use to become smarter.   Unlike a typical cloud platform, EPIC is primarily driven by business rules and consolidates unique features by supporting natively semantic languages and IoT (Internet of Things). This approach makes 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.

EPIC believes that a truly 'Smart City' is one that is able to:

1. Benefit from the innovative developments of citizens, SMEs and other actors from across Europe rather than just within their own cities.
2. Leverage a service infrastructure that is capable of delivering 'one stop government' through the integration of services, interoperability of systems and use of actionable intelligence in service delivery.
3. Contribute to a multi-national service-oriented ecosystem by providing and sharing open business processes as services with other cities.

EPIC is predicated on the belief that a successful 'Smart City' approach needs to overcome the fragmentation and duplication that currently prevents innovative synergies between large technology and service providers, city administrators across Europe, small and medium-sized enterprises and end-users. EPIC provides a secure and trusted on-demand IT infrastructure, integrated web services and an implementation roadmap that will help deliver the necessary economies of scale and network effects to achieve high impact public service innovation in cost-efficient and effective manner.

EPIC will help stakeholders across the public service delivery chain to kick start innovation and work smarter:

1. **Cities**:
   a. Enhanced ability to provide more innovative, efficient and effective services at a reduced cost.
   b. New business models and working relationships with other cities and improved relationships with citizens and businesses.
2. **Citizens**:
   a. Access to more innovative, efficient and effective services.
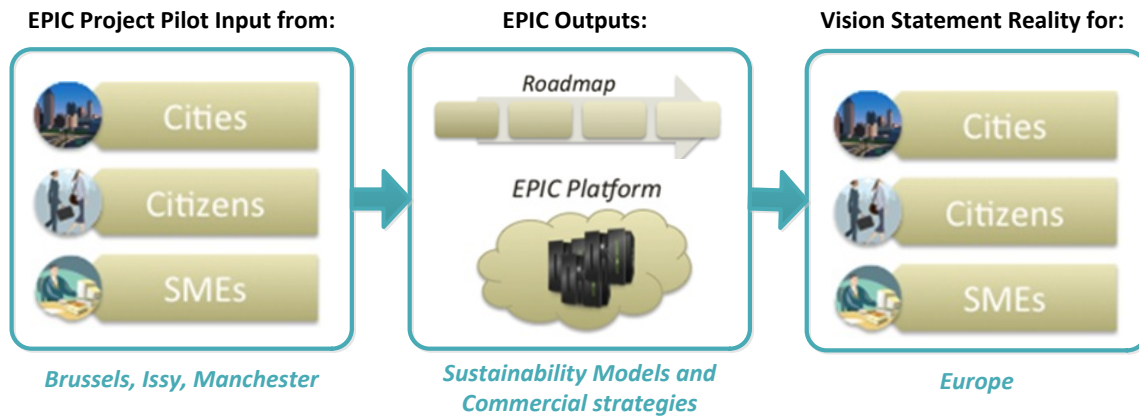   b. Enhanced ability to help improve public services.

3. **SMEs**:

    a. Greater access to local and international markets.

    b. Ability to work more cost-effectively via the **EPIC** cloud platform.

Therefore a summary of EPIC's vision statement can be condensed as follows:

"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".

2. EPIC Mission Statement

By 2013 the EPIC 'Intelligent City' vision will have begun to become a reality for Brussels, Manchester and Issy-les-Moulineaux through the creation, use and improvement of the implementation roadmap and EPIC platform. At the same time the project will focus on creating a strategy to deliver the EPIC vision further across Europe through the creation of sustainable commercial models that will continue offering services and benefits long after the end of the project.

EPIC Project Pilot Input from:	EPIC Outputs:	Vision Statement Reality for:
Cities	Roadmap	Cities
Citizens	EPIC Platform	Citizens
SMEs		SMEs
Brussels, Issy, Manchester	*Sustainability Models and Commercial strategies*	*Europe*

Figure 1: *Making the Vision Statement a Reality*

3. Vision Delivery

3.1 Objectives and Methodology

In order to deliver the vision, the EPIC project has been designed to examine the needs, requirements and added value of a pan-European 'Smart City' service delivery platform for leading ICT companies, specialist SMEs, Living Labs, and established and 'wannabe' Smart Cities.

The specific objective of the project is to explore the particular implementations of the cloud platform paradigm as the basis for a pan-European service delivery platform that will enable a more holistic approach to making cities smarter. Toward this end, the proposed solution is based on an innovative cloud platform that weds the new Living Lab methodology for public service reform to future-oriented technologies such as augmented reality and the Internet of Things.

Living Labs have become an established part of local and regional innovation systems. Living Labs research is particularly well-suited to improve R&D processes thanks to the way in which it specifically engages users to help tackle key issues concerning behavioural change and innovation, business modelling and impact assessments, organisational processes and structures, multi-stakeholder participation, and (multi-)cultural specificities. As such, the Living Lab approach has the potential to help advance 'Smart City' operations through 1) its focus on merging research and innovation processes with the daily, real-life context of people in their roles as citizens and consumers and 2) its ability to leverage the involvement of enterprises and SMEs in a manner that creates new business models and value networks.

The term 'Smart City' is rather broad and can include a variety of services that are offered to citizens and visitors as well as different concepts and objectives that vary from city to city, even in the same country. Therefore, a key objective of the project is to produce an empirically-based methodology to help cities become smart(er). This methodology will underpin a fundamental part of the solution, and will be based on the lessons learned by three cities - Brussels, Issy-les-Molineaux and Manchester - that are actively using the Living Lab focus on engaging end-users in service design to create new 'Smart City' services.

In Brussels, project partners will help to create a new Relocation Service for families moving to Brussels. The new application will be designed to help a family find a new place to live according to their specific requirements. Augmented reality will be used to visualise inquiry results, and citizens will ultimately be able to walk through their new neighbourhood and ask questions along the way. In Issy-les-Molineaux, a new Urban Planning service will create a virtual space for consultation and dialogue between public administrators, citizens and business on proposed urban developments. The application will combine rich media, 3D modelling, and symbolic information to enable users to experience planned developments for themselves. Thanks to state-of-the-art technology, users will be able to fly over a digital 3D model of a city and experience new developments for 'real'. Finally, in Manchester, a new

Environment Service will integrate new and existing RFID/IoT technologies to help households monitor their carbon consumption. IoT data collectors will measure environmental factors such as electricity usage, temperature and gas consumption to provide households with a snapshot of their energy use. Cities, in turn, will then be able to use the information gathered to influence policy and achieve carbon reduction targets.

The success of the EPIC in terms of its ability to use a cloud-based service platform to deploy cross-border 'smart' services will be tested through the deployment of the newly created services in the 'virgin' city of Tirgu Mures, Romania which is only just now beginning to introduce 'Smart City' concepts into its service delivery model. The ultimate validation for EPIC will lie in its ability to 1) help simplify the processes of developing and extending 'smart' services within the Living Lab environment and 2) use the cloud to deliver these 'smart' services in a sustainable cost effective manner to a pan-European (and possible worldwide) market.

3.2   Technology

Cloud computing is a common buzzword in eGovernment circles these days, and holds the potential to help European cities transfer and share innovative public sector applications amongst themselves. Despite all the hype, however, very few public administrations really understand the long-term benefits of cloud computing in terms of helping cities realise key strategic goals and work 'smarter'. Whilst many public sector bodies are beginning to understand that the cloud can help them to reduce cost and achieve economies of scale, uncertainty is rife in terms of how to migrate current systems to the 'cloud' let alone to 'future proof' for on-stream technological advances such as IoT. According to a recent global survey by Red Shift, only 23% of organizations in the public sector are actually using cloud computing, versus 42% of private-sector companies, whilst just only 25% of public-sector organizations considering use of the cloud at this point in time believe they have the necessary in-house expertise to do so.

In light of this current state of affairs, the EPIC platform is intentionally designed to combine cloud computing technology with more advanced features such as IoT middleware and semantic capabilities in a manner that facilitates easy implementation. In so doing, the EPIC technology solution aims to create a 'one-stop' pan-European service delivery ecosystem that public administrators can easily use to plug-and-play innovative new 'Smart City' services. The platform is comprised of three core elements:

EPIC Test and Development Cloud
At its core, EPIC will deploy IBM SmartCloud Enterprise as the basis for single point of access for European public administrators. This IBM SmartCloud Enterprise was chosen because it is designed to answer the current 'Smart City' need for a flexible and cost-efficient computing infrastructure and back office portal server that is accessible and relatively easy to use. The platform's self-service test environment, ease-of-use design, service request management, automated provisioning and configuration management are all intended to help overcome current public sector resistance to

innovative use of the cloud by providing on-demand access to both basic and pan-European 'Smart City' services.

Semantic Layer

The current fragmentation and hyper local nature of the European Living Lab environment means that is often difficult to promote, let alone share, innovation across the European public sector. This problem is further complicated by the numerous languages spoken throughout Europe. To address this challenge, EPIC includes a formal language (based on C2LG) to facilitate multi-lingual access to the service application and lay the foundations for easy cross-language adaptation and communication within the Cloud. To access and deliver innovation applications from across Europe via the cloud, all a 'Smart City' will need to do is to map information into the formal language, convert it into the target language and modify the ontology that represents the formal language's semantics for local usage.

IOT Middleware

One of the most innovative aspects of the EPIC platform is the use of the 'Internet of Things' (IoT) to provide common middleware for advance, future-oriented 'Smart City' services. IoT middleware will provide access to all kinds of geo-location and IoT technologies from 3D representations through to RFID sensors and Geo-tagging. The true value of the IoT is the combination of public services with sensor technology that enables connectivity between current and future devices. Under the EPIC 'Smart City' vision chosen objects will be able to "think", "feel" and "talk" with each other, making it possible for city administrators to monitor and control these objects everywhere and anytime and ultimately create an intelligent or 'smart' service. The platform will make it easier for third parties such as Living Labs and SMEs to develop and provide IoT "plug-ins" that will allow any device within reason to be connected to the cloud. This type of advanced service model 'hides' the complexity of the underlying cloud infrastructure whilst at the same time meeting complex public sector requirements for cloud such as security, heterogeneity, interoperability, scalability, extensibility and configurability.

Besides the aforementioned platform elements, a key outcome of the EPIC project is the development of the **roadmap** to be used as a guide for a pan-European exploitation of the platform. The roadmap will cover all aspects of EPIC and will describe the required steps for a successful exploitation of EPIC for both cities and businesses. It aims to encourage them to take up cloud computing for smarter working through adopting a practical, business-tested roadmap that will help to guide cities in harnessing new 'smart' technologies. It will also focus on working business models, including Public-Private Partnership (PPP). The business models are defined by specific assumptions concerning the involved participants, the functions they perform, the key terms between them, provided funding and ownership. Moreover, the defined business models and best practices are expected to meet specific needs for accessibility, security and authorization, regularity enablers and financial and technical viability of the EPIC solution across 'Smart City' stakeholders.

3.3   Benefit and Impact

One of the main objectives of the EPIC project is to offer public administrations an opportunity to reduce costs and drive innovation by providing them with access to a shared cloud computing infrastructure that facilitates rapid prototyping and testing as well as wide accessibility and availability. Upon completion it is envisioned that EPIC will accelerate the move towards 'Smart Cities' at both the service delivery and infrastructure level by creating an open, pan-European platform for public and 'intelligent' services that leverages the Living Labs approach and enables 'Smart Cities' to learn from one another and exchange practical working models in a real-life context.

Through EPIC, information, communication sources and applications, which are currently only available to specific city councils, will be adapted to the Cloud-service portal and offered as service to cities across Europe. At the same time, innovative new products that are created locally will be adapted for the cloud and made available using retributive models for the city and businesses. In this way, EPIC will help SMEs to significantly accelerate their business plans and upscale from the Living Lab environment to real-life urban deployment not just locally but throughout Europe.

By making it easier for cities to take advantage of Living Lab innovations, EPIC will help the public sector to collaborate more effectively with the private sector – and especially SMEs – in the creation of more personalized and customized services. By making it easier for them to use cloud computing and other cutting-edge technologies, it will help them to minimize the capital and operational costs for their own organizations. Finally, by providing a truly pan-European platform and an implementation roadmap, EPIC will help European Cities gain the agility and scalability they need to deliver 'intelligent' applications via the dynamic and on-demand provisioning of resources in a self-service context.