PEOPLE

Deliverable D3.1.4 – PEOPLE Scoreboard

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Dissemination Level		
PU	Public	x
PP	Restricted to other programme participants	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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1. Executive summary

1.1 Document purpose

This document is meant to provide for the PEOPLE scoreboard as part of the activities for benchmarking and synergies amongst pilots in the PEOPLE Monitoring Layer. As a continuous task active during the whole duration of the project with several iterative reports, the deliverable will define the scoreboard in order to reach a formal structured assessment of pilot smart urban ecosystems, useful for the definition of the impact of the PEOPLE project and ICT services on the pilots and the overall concept of Smart Cities.
In order to reach this objective, this second 3.1 deliverable will build upon the results of the first deliverable to define the final scoreboard indicators and framework for data collection and processing.
For this purpose section 2 is a revised version based on the first deliverable, stating the purpose of the scoreboard and the position of the deliverable as part of the PEOPLE project. Section 3 is a revised version of the first deliverable stating the general framework and guidelines for the scoreboard creation on the objectives and targets of the project. Section 4 gives the final scoreboard indicators that will be used to assess the impact of the project and pilots on the smart urban ecosystems. Section 5 give the framework for data collection and processing that will be implemented. Section 6 provides a detailed analysis of the means of collection that the Pilots will use for obtaining the values of the indicators. Finally, section 7 provides an insight of the strategy that will be used in the next deliverable for processing the data. The final section will give the general conclusions on the deliverable and the scoreboard.

2. Scoreboard introduction

The scoreboard will be determined and adapted throughout the PEOPLE project with the objective to reach a final PEOPLE scoreboard that will serve as a benchmarking tool for projects in the field of smart cities and research. There will be only one single scoreboard, valid for all pilots. This introductory section will define clearly the objectives and purpose of the PEOPLE Scoreboard and its place in the PEOPLE project.

2.1 Scoreboard purpose

The objective of the scoreboard is to demonstrate the impact of the PEOPLE Project and the ICT services on the PEOPLE pilots and society as Smart Cities and Smart Open Innovation Urban Ecosystems. The scoreboard will have the following purposes:

- The PEOPLE scoreboard will be used as an implementation tool for future innovation projects that define new ICT services in the PEOPLE pilots after the PEOPLE project end, providing an important sustainability tool to the pilots and the project results.
- The PEOPLE scoreboard will serve as a benchmarking tool between Smart Cities across boundaries, making it possible to define advancements of the Smart Cities concept in Europe.
- The PEOPLE scoreboard will consists of relevant indicators that can be used to show clear advantages and disadvantages for different ICT services, making it possible to use the scoreboard as a tool for defining successful ICT services in Smart Cities and their subsequent business models.
- Through the PEOPLE scoreboard indicators it will be possible to define the impact of user driven methodologies and the participation of end-users and stakeholders in the evolvement of the Smart Cities, giving precedence to future projects and initiatives.

The approach used for the development of the scoreboard in the project, will start with the definition of the Smart City according to the PEOPLE project. Based on this definition we will explain how the objectives of the PEOPLE project and ICT services are expected to create an impact on pilot sites as Smart Cities. Once we have defined these clear objectives and aims of the project, we can link them to specific indicators that can be measured. These indicators will form the scoreboard, demonstrating the impact of the pilots and ICT services on the Smart Cities and its citizens. Once the overall indicator scheme has been defined, an effort will be carried out to set numerical scales for each indicator throughout the project, making it possible to define a level of smartness in the cities that can be directly linked to the pilot actions. This will be done through bibliographic analysis, surveys and interviews with users via the network of ´activation agents, applying the highest level of automation possible in order to obtain a continuous input. Through the sustainable use of the scoreboard a progress in the pilots as Smart Cities can be detected in the future after the project ending.

2.2 The scoreboard as part of the PEOPLE project

The first version of this iterative document has set the overall theoretical framework of the project based on the Smart City concept. This framework, which is summarized in the following section, has made it possible to define the final indicators and scoreboard that will be used to measure the impact and which will be elaborated on in this second version. Additionally this version of the deliverable will define a framework for

data collection and processing, in order to start the assessment of the impact in parallel with the start of the first innovation cycle.[1]

D3.1.1 – Theoretical framework to define the targets and a set of preliminary indicators as a starting point for further discussion and debate.
D3.1.2 – Final indicator scheme for the scoreboard and the framework for data collection and processing to start the impact assessment as of month 12.
D3.1.3 – Update on the data collection and processing of the final indicator scheme for the scoreboard. Changes in the scoreboard can still be applied, based on the deployment of ICT services and synergies between the pilots.
D3.1.4 – Final PEOPLE Scoreboard and impact levels of the pilots.

Figure one demonstrates this timeline (see figure 1).

Deliverable Number	Contents	M6	12	18	24
D3.1a	Target framework and preliminary indicators				
D3.1b	Final indicators and framework for data collection and processing				
D3.3c	Update on data collection and processing				
D3.4d	Final PEOPLE Scoreboard				

1 PEOPLE Scoreboard definition during the PEOPLE project

To avoid confusion, the difference must be stressed between the activities for the PEOPLE scoreboard and the evaluation and monitoring of the People pilot activities that are recompiled in deliverable 1.7. Whereas the scoreboard has the objective to define the overall impact of the PEOPLE pilots and ICT services on the smart cities and society beyond the PEOPLE project, the evaluation and monitoring activities analyze the activities of the pilots and its effectiveness and efficiency as part of the PEOPLE project. The evaluation and monitoring activities use for this purpose a set of indicators that are adapted to each pilot´s reality and that take into consideration the particularities of the city and pilot objectives as explained and defined in D1.7a. It must be noted that synergies may arise between the two iterative tasks throughout the project duration, especially in the use of data and information that is generated. These synergies will lead however to fundamentally different objectives.

[1] The preparation cycle is an initial phase in the PEOPLE project and runs from month 1 until month 12. The first innovation cycle starts in month 12. For a further definition see the PEOPLE Wiki.

3. Theoretical Framework

In order to define the final the scoreboard indicators, the targets of the call, project, pilots and ICT services must be defined clearly. These targets will be placed in the framework of the Smart City concept, offering a theoretical framework for the indicator definition as described in this section.

3.1 Smart Cities in PEOPLE

The main objective of the PEOPLE project as stated in the DoW is:

´speeding up the uptake of smart cities through the rapid implementation, deployment and uptake of innovative internet-based services in order to allow facing the main challenges of developed cities at present and towards their future quality of life.´[2]

The impact of the PEOPLE project and services on the Smart City, can only be of value if the target is defined well. Therefore this section will define extensively the Smart City concept as used in the PEOPLE project.
Initially the concept of Smart Cities was mainly focused on the availability and quality of ICT infrastructures in a city. However important research has been carried out to give an overall definition and to identify factors and driving forces of Smart Cities. Sociology professor Robert Holland for example, sees an important role for citizens in driving Smart Cities, with a focus on education and innovation. He concludes that *Smart Cities are territories with a high capacity for learning and innovation, which is built-in to the creativity of their population, their institutions of knowledge creation and their digital infrastructure for communication (and are concerned) with people and the human capital side of the equation, rather than blindly believing that IT itself can automatically transform and improve cities.*[3] This definition is of great importance to the PEOPLE project as it situates citizens in the centre point of Smart Cities development. In the PEOPLE project this will be enabled by designing and implementing user-driven open innovation methodologies and processes, starting the process from the citizens. However PEOPLE is also using a wide variety of ICT services and data models to speed up the smart cities process, not contemplated in this definition.
A broader and updated definition of the Smart City is given by Caragliu et all, including such factors as transport, environment and policy in driving Smart Cities, stating that *a city is smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance.*[4]
Based on this broad definition we can conclude that all cities are **agglomerations of different systems and sectors.** Therefore in order to define the level of Smartness in a city, we need to define the dimensions that are covered by the PEOPLE project.

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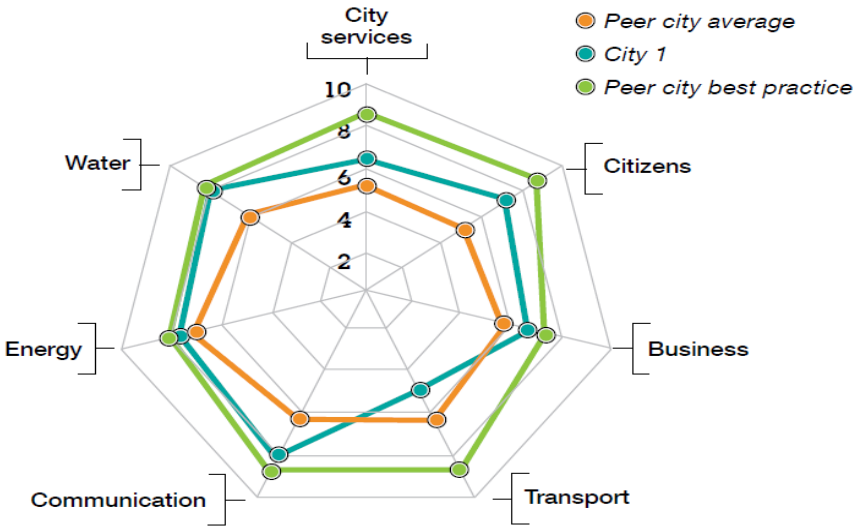
[2] PEOPLE DoW, version 4, page 5.
[3] Holland, R.G., *Will the real Smart City please stand up?* ´City´, (2008), 12 -3, 303-320, 315.
[4] Caragliu, et all. *Smart Cities in Europe*, ´3rd Central European Conference in Regional Science´, (2009) 45-59, 50.

IBM for example identifies in the Smarter Cities Roadmap some essential core systems represented in figure 3 (on the following page) that define whether a city is smart or not.



2 Smartness of a City based on IBM subsystem definition[5]

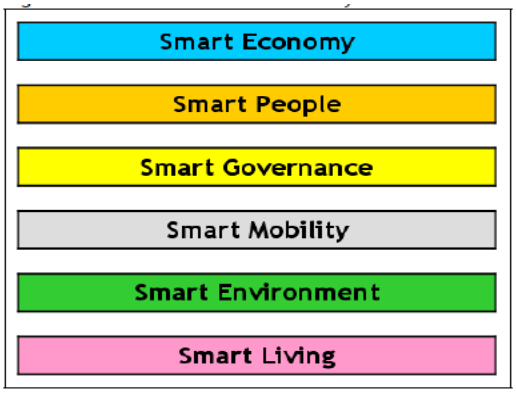
This definition of smart city as depicted here, consists of the following core systems:

- **City services** through e-government and use of ICT for service delivery and management by local government.
- **Citizens** that use ICT for human and social services related to education, health, housing and social aspects.
- **Businesses** that make use of an efficient business system with a high level of innovation and creation.
- **Transport systems** and the accessibility to and from cities.
- **Communication** through ICT infrastructures such as High-speed broadband and Wi-Fi.
- **Water** and the use smart technologies for water management and regulation.
- **Energy** and the presence of smart grids and use of smart metering for energy management.[6]

These sub sectors can also be linked to the definition given by the Centre of Regional Science in Vienna, providing for six dimensions of the Smart City. It takes into consideration different aspects of city

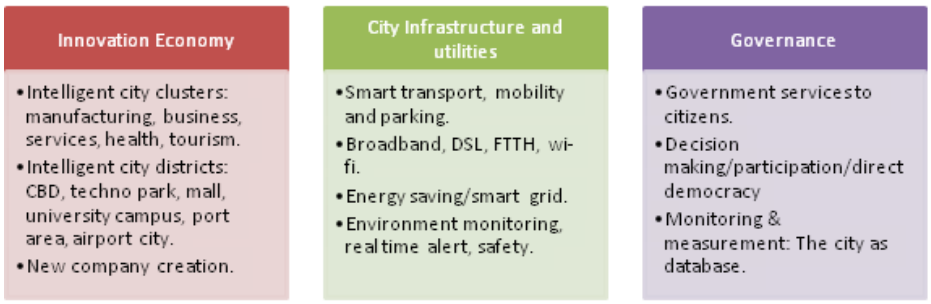
[5] Dirks, S., et all. *How Smart is your City? Helping cities measure progress* ´IBM Global Business Institute´, (2009) 5.
[6] Ibidem.

development, identifying six main axes or dimensions that together constitute a Smart City. These six dimensions depicted in figure 4 connect with traditional regional and neoclassical theories of urban growth and development. In particular, the axes are based - respectively - on theories of regional competitiveness, transport and ICT economics, natural resources, human and social capital, quality of life, and participation of citizens in the governance of cities.[7]



3 Dimensions of a Smart City by the Centre of Regional Science[8]

However this definition shows some weaknesses in overlapping between the different subsectors, making it difficult to use for the PEOPLE project objectives.
Hans Schaffers, Nicos Komninos, et. all divide ten different subsectors, such as economy, education, healthcare, culture, transport, environment, etc. into three main subareas, called, **Innovation Economy, City Infrastructure and Utilities and Governance,** as shown in figure 5.



4 Smart City sections Hans Schaffers et all.[9]

[7] Vienna Centre of Regional Science, (2007) *Smart Cities: ranking of European medium sized cities*, www.smart-cities.eu, 10
[8] Ibidem.

This final definition corresponds to the concept of smart cities as open and user-driven innovation environments, however it still fails to define properly the role and implication of citizens as end-users in the Smart City, one of the most important sections and objectives for the PEOPLE project.
Therefore the PEOPLE project will apply a compilation and extension of these different definitions and dimensions or axes that have been discussed here, making it possible to define the different axes of the Smart City in accordance to the main objectives of the project and the ICT services in order to determine the impact of the PEOPLE project and the PEOPLE ICT services in the different pilot sites.
The following section will define the PEOPLE dimensions based on the different definitions provided for in this section. These dimensions will be linked directly to the main objectives of the pilots and ICT services of PEOPLE. In section 4 indicators will be defined with methods for measurement in each of the dimensions, constituting the preliminary PEOPLE scoreboard.

3.2 PEOPLE Project objectives and services

As stated before the overall objective of PEOPLE is to speed up the uptake of smart cities through the implementation, deployment and uptake of innovative internet-based services, facing main challenges of developed cities and improve the quality of life of citizens.

This general objective responds to the following call objectives of the CIP ICT PSP work programme:

- Stimulating a wave of future internet-based services using innovative internet technologies
- Wider uptake of innovation ecosystems in cities through networking and sharing of experiences in planning and implementing smart cities concepts
- Reinforcing the role of the user/citizen in the innovation lifecycle, facilitating technological and also social innovation, and converging towards common standards and quality model and methodologies in user-driven open innovation
- Improving capacities for SME's, including micro-entrepreneurs, to develop, validate and integrate new ideas and rapidly scale-up for their services and products
- Accelerating the development of a sustainable, competitive, innovative and inclusive information society
- Bridging the gap between the development of internet-based technologies and their rapid uptake in new services

In order to obtain these objectives each pilot will implement and deploy innovative internet-based services. An overview of these preliminary services, proposed in the different PEOPLE pilots and dependent on the interests of stakeholders can be found in deliverable 1.2. It is expected that these services will have a direct impact on the obtainment of the project objectives and subsequently on the pilots as Smart Cities. As the services deployment will evolve and new services will be added through synergies between the pilots, the

[9] Schaffers, H., N. Komninos, et all, *Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation* ´FIA Book´ n10, 431-446, 435.

classification in the different Smart City dimensions makes it possible to maintain an overall overview of the pilot impact.

Smart Economy:

The Economy dimension in the PEOPLE Scoreboard uses smartness and innovative technologies to stimulate further progress in the economy related to entrepreneurship and business. It refers to an important level of innovative spirit and flexibility in an economy, embedded in an international spirit with high levels of import and export and that obtains high levels of productivity. In a Smart Economy, employment and the labor market is highly flexible and people can change easily between jobs, work part time or work from their home through ICT technologies.

Smart Economy is expected to show results in relation to the PEOPLE project objective to stimulate the capacities of SMEs to develop, validate and integrate new ideas, services and products. Therefore the dimension of Smart Economy relates to SMEs that use innovative technologies to improve their business making. SMEs are the main drivers of economic progress in many member states of the European Union and are therefore a priority of the Commission's economic policy. Subsequently, it is expected that the smartness of SMEs in a specific ecosystem, defined by their use of ICT services will give a clear indication on the Smart Economy.

If we look at the proposed ICT services in the different pilots, we can expect that for example the **Smart Scheduler** from the Bremen pilot has an impact on the Smart Economy and vice versa. This application, meant to bring people and companies together, that match certain characteristics, skills and preferences, improves knowledge and activities transparency on the demands and offers in the economy. Another service that is expected to have an impact on the Smart Economy of a pilot is the proposed **Virtual Marketplace and Business Directory** in the Thermi pilot with the objective to stimulate the local market within an online-environment.

Smart Infrastructures:

The Infrastructure dimension in the PEOPLE Scoreboard refers both to transport infrastructures and to ICT infrastructures. It is considered that the existence of an extensive ICT infrastructure system is a perquisite for the Smart City. Therefore in order to define the impact of PEOPLE on the pilots it is important to know the level of availability of wireless internet and broadband across the city. **It is expected that the PEOPLE project will have a positive effect on the availability of ICT infrastructures in the pilots.**

The public transport system of a Smart City offers a high level of quality, access and safety through the use of innovative technologies. It also refers to the road infrastructure of a city, the accessibility of a city by highways, the congestion of traffic and parking spaces, but also to the facilities for the use of bicycles (bicycle paths and parking) as transport means. These aspects also show clear connections to environment and air pollution, stimulating the use of more environmental friendly transport.

There are several proposed ICT services that will possibly have an impact on the level of Smart Infrastructures. For example the **Parking Spaces Availability** by the Thermi pilot that will facilitate a smooth parking system. The **Indoor navigation** service will facilitate the mobility in public buildings as well as the **Instant message service** and **NFC access control for buildings** are expected to facilitate mobility in a

Smart City. The **Smart Bus Stops** proposed by the Vitry Pilot will have an impact on the level of quality of the public transport system.
These ICT services will increase the Smart Infrastructures, at the same time when infrastructures are improving and more data is available, the mobility will also grow in parallel improving the **further uptake of innovation**.

Smart Governance

Smart Governance relates to the role of public authorities in order to push the innovation process in the Smart City further through specific R&D programs and incentives. It also relates to the level of transparent governance through innovative technologies. **Therefore it is also expected that dimension among others will demonstrate the PEOPLE objective to accelerate the development of a sustainable, competitive, innovative and inclusive information society.** Public information can be made easily accessible to the larger audience by using the internet, increasing the transparency for the citizens and improving inclusiveness. The availability and mobility of public data coming from the urban ecosystem without restrictions from copyrights or other mechanisms of control will help **to provide a data model that will be the basis for a rapid uptake of internet-based services in the city,** one of the main objectives of the PEOPLE project.
Smart Governance also refers to the use of technologies in order to facilitate high quality public and social services from authorities. This can have a wide range from the use of ICT technologies for better health services, education, transport, tourism, etc. **Through the involvement of public authorities as important stakeholders in the project, the innovation ecosystems** in cities will be further stimulated.
If we look at the different ICT services proposed we can detect various possibilities that can influence Smart Governance. The **public authority and citizens portal** proposed by the Vitry pilot is a clear example of improving the information transparency. The **GEOCUR Service** in Bilbao facilitates information from public associations that give trainings and the **3D Virtual tour** facilitate public services towards tourists. The **Citizen Request** proposed by the Thermi pilot will stimulate the citizen participation in public processes by giving specific requests to the public administration. Finally the Bremen pilot proposes different services for the improvement of public services and information transparency in the University, improving the education services towards students, such as the **Borrow Books in the Library** service, the **FAQ App** and **Examination Regulation Support Service.**

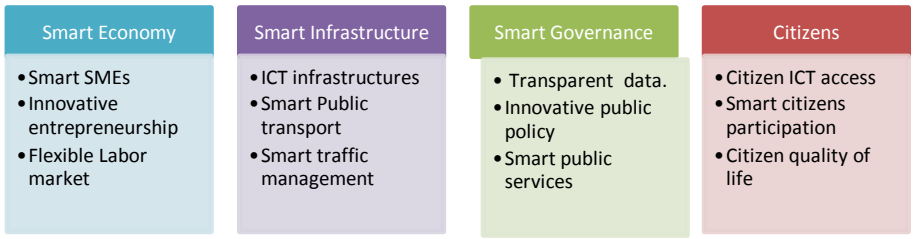
Citizens in Smart Cities

In its most basic and general interpretation, the idea behind a Smart City should be an increase in quality of life for its citizens and travelers.[10] Therefore the PEOPLE dimension of Citizens is considered as essential in the evolution of Smart Cities for the uptake and implementation of ICT services. The PEOPLE project starts from the assumption that citizens will enable the design of the Smart Cities from a user-centric perspective,

[10] Net!Works European Technology Platform Working Group ´Smart Cities Applications and Requirements´ *White Paper* (2011), 10.

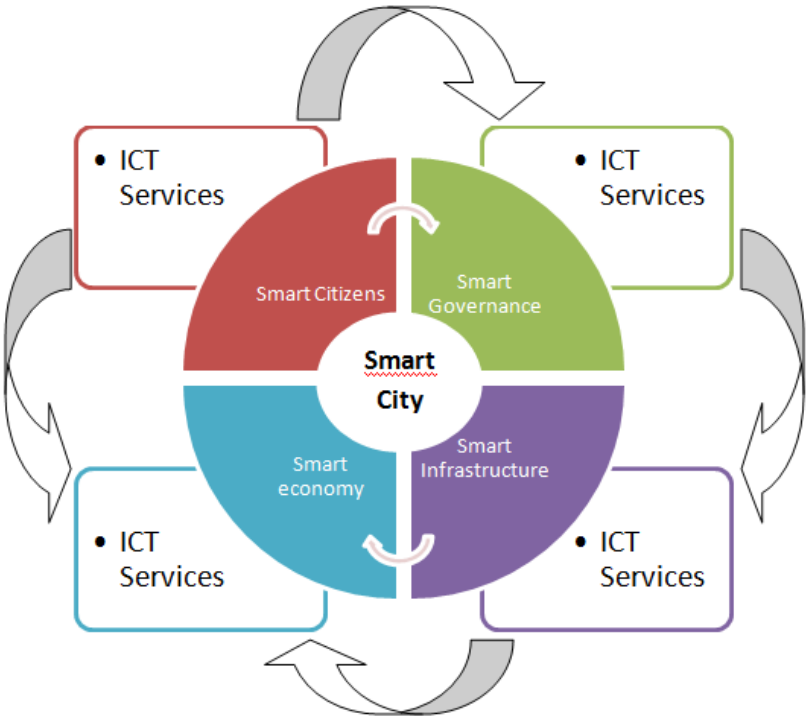
starting from their demands and requirements and feeding on a constant user feedback regarding ICT services. Therefore the possibilities for citizens to access ICT services must be clear in order to determine the impact on the Smart City. The use of innovative technologies by citizens often depends on such issues as the level of education, age, the open mindedness of persons and their participation in society. This dimension therefore determines also the use of innovative technologies for everyday activities and interactions by citizens, for example buying on the internet or arranging and organizing leisure and touristic activities and managing public services. The improvement of quality of life of citizens can be reached by increasing the efficiency and efficacy of government, of better infrastructures and by stimulating the economic progress. Therefore in this dimension the level of satisfaction of citizens must be determined in the different dimensions. Citizens are seen as the main end-users of all ICT services and it is therefore expected that this dimension will give indicators related to all the ICT services that will be deployed in PEOPLE. **This dimension will measure the role of the user/citizen in the innovation lifecycle and the driving of Smart Cities, facilitating technological and also social innovation, and converging towards common standards and quality model and methodologies in user-driven open innovation.**

These four dimensions have been defined as the most important drivers for new and innovative ICT services in the PEOPLE project. At the same time it is expected that they will show the highest impact as a result of the implementation of the ICT services in PEOPLE. Other factors that are of high importance for the general Smart City concept, such as for example environment and health have not been included, as they do not relate to the specific PEOPLE objectives. It is considered that by limiting the dimensions of the PEOPLE Scoreboard, the usefulness of the scoreboard will increase, focusing only on the most important aspects for the project. The following figure summarizes the PEOPLE dimensions.



5 PEOPLE Scoreboard dimensions

The progress in the different dimensions is stimulated through further integration of innovative technologies in the pilots, creating a reciprocal process in stimulating and reinforcing the Smart City. At the same time there exists a reciprocal process between the different dimensions; smarter infrastructures, will in the end, also have effects on smart economy, smart governance and smart citizens. This process represented in figure 7, reflects the PEOPLE objective of **bridging the gap between the development of internet based technologies and their rapid uptake in new services**, creating synergies between all dimensions of the Smart City through ICT services.



6 Interactions and synergies between the PEOPLE Scoreboard dimensions and ICT services

This definition in different dimensions and the different processes and interactions will make it possible to define specific indicators that measure the impact of the ICT services and the pilots on the Smart Cities in the following section.

4. Scoreboard Indicators

As indicated in the section above, the scoreboard consists of a set of indicators. By giving concrete values to these indicators, the impact of different actions in Smart Cities can be defined and the pilots can be compared through a process of benchmarking. This section will firstly elaborate on how the final indicators have been defined and secondly give the final indicators scheme with the help of the defined dimensions in the above section.

4.1 Indicator selection

The definition of the scoreboard consists first of all of the actual limitation and selection of the indicators during the preparation cycle. An important tool in the indicator limitation and definition is the **PEOPLE Wiki.** The Wiki contributes to knowledge sharing and to the creation of synergies among pilots that are reflected in the scoreboard. The final scoreboard indicator scheme has been published on the PEOPLE wiki.

The process of indicator selection will also favor the usability of the scoreboard beyond the project as a benchmarking tool for smart cities in general, responding to a wide range of needs and characteristics and at the same time giving a sufficient level of debt to the scoreboard.
This process has been performed, taking into account the following issues:

- **ICT services.** During the preparation phase, the final ICT services have been implemented. These ICT services were still adapted to the needs of the stakeholders and user feedback. The final definition of the ICT services during the past few months have made it possible to give a clearer indication on the final indicators that must be implemented.
- **Data availability.** Another important point for the final indicator scheme is the data availability. Based on research it has resulted that some data could not be obtained in the specific scenarios. This has led to the deletion of some of the preliminary indicators.
- **Pilot differences.** There will be only one scoreboard scheme applicable to all pilots. Extensive debate has been made between the different pilots in order to reach a compromise for the inclusion of the final indicators that reflect all pilots responding to the specific needs and characteristics of each of them.

4.2 Smart Economy

The Smart Economy dimension in the PEOPLE Scoreboard uses smartness and innovative technologies to stimulate further progress in the economy related to entrepreneurship, businesses, innovation and labor flexibility. These following indicators of the Smart Economy will be measured:

Indicator: Businesses in Smart Cities
Rationale: Businesses in the EU are the key driver for economic growth, innovation, employment and social integration. The project has the objective to improve the competitiveness of businesses in the Smart Cities

through the use of innovative ICT. Therefore this indicator will demonstrate the impact of the uptake of innovative technologies and services by businesses in order to increase productivity and revenue.

Measurement:

- **Number of companies involved in the project (pilot).**

The amount of companies that are using the ICT services for their activities will demonstrate the acceptance of the concept among businesses. The amount of businesses that are involved in the pilot through different ways, giving feedback and requirements, will express the degree of influence of the companies on the service creation and improvement.

- **Number of businesses adopting or using the projects ICT services as part of their activity.** This measurement will give an indication on the acceptance of businesses of the Smart City concept and innovative ICT services.

Indicator: Smart Services and Products

Rationale: The objective of the project is to end with a portfolio of ICT services that are really integrated, composed, adapted and deployed, based on the city's most important needs, challenges and priorities. These services use the data coming from the urban ecosystem into which they are implemented. The services are focused on overcoming/alleviating some of the critical challenges faced by cities nowadays that will make participant citizens perceive that they live better, demonstrating the advantages of the internet-based services deployed and of smart cities (and gearing cultural change towards their uptake)[11].

Measurement:

- **Number of developed and conceptualized commercial services that can be transferred/uptaken by businesses.** The number of conceptualized commercial services that are collected by the project and that have a business model can be scaled up by companies, demonstrating an impact on the Smart Economy of the Smart City.

Indicator: Innovative entrepreneurship

Rationale: The objective of the PEOPLE pilots is to stimulate entrepreneurship and to improve capacities for entrepreneurs to develop, validate and integrate new ideas and rapidly scale-up for their services and products. This indicator will demonstrate the impact on the development of new ideas, services and products in the Smart Economy.

Measurement:

- **The number of licenses defined**. In order to measure the level of entrepreneurship of the results of the project and the capacities to develop new products and services based on these results that will determine the competitive advantage and the progress in the Smart Economy, the number of protective measures that have been defined in the Smart Cities as a result from the project.
- **Number of companies that express interest in open data availability.** The number of companies that express interest in open data availability through the project demonstrates the potential for further innovative entrepreneurship. It reflects the level of exploitability of the results of the project and its

[11] DoWv4, page 7.

interest towards businesses. This will constitute an impact on the smart economy and the smart city in general.

- **Number of innovative technological business registrations based on the project results.** . In order to define the level of innovative entrepreneurship, the new business registrations over a certain period will be analyzed that can be linked directly to the results of the project. A higher share of innovative new companies reflects a higher level of innovative activities and a smarter economy.
- **Number of entrepreneurs using the project´s ICT services**: This indicator looks at the activity of individuals in the Smart Economy, using ICT services to offer their professional services and to look for commercial collaboration.

4.3 Smart Infrastructures

The Infrastructure dimension in the PEOPLE Scoreboard refers both to transport infrastructures and to ICT infrastructures, giving a complete overview of the effects of ICT services on these different types of infrastructures.

Indicator: ICT infrastructures
Rationale: The availability of ICT infrastructures, such as broadband access, DSL, FTTH and wi-fi is in many cases a condition for the use of innovative and inclusive ICT services across the Smart City. The availability of ICT infrastructures accelerates the development of a sustainable, competitive, innovative and inclusive information society. The indicator on ICT infrastructures will therefore give a direct image of Smartness of Cities.
Measurement:

- **Percentage of the city area covered by public wifi access.** This measurement will give a clear picture on the availability of ICT infrastructures across a city, facilitated by public authorities and private companies. It does not look at the amount of users that have access to internet through their private internet access, which is covered for in the dimension on smart citizens.
- **Percentage of area covered by UMTS.** This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.
- **Percentage of area covered by LTE.** This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.

Indicator: Smart Transport
Rationale: Traffic congestions and the sustainability agenda has brought renewed focus on public transport (buses, trains, metro, etc.) utilization in cities. Access to high quality information is of increasing importance as the transport becomes ever more dense, giving more control to the users and enable them to make decisions about the commute, helping them to manage their time and experience. ICT technologies facilitate payments, give mobile and station based information on transport and durations and improve the quality of transport.
Measurement:

- **Amount of innovative ICT services that facilitate transport in the city.** The amount of ICT services resulting from the project that facilitate transport can consist of real time information facilities, automatic payments, intelligent bus stops, etc. and demonstrate the impact on the smart infrastructure of the city.

Indicator: Smart Public Infrastructures:
Rationale: The use of innovative ICT services by public infrastructures provides for an increased amount of data. It gives the opportunity to deploy new innovative ICT services based on these smart infrastructures in smart buildings. This indicator also reflects the use of smart technologies in the smart city and the embeddedness in the society.
Measurement:

- **Percentage of public buildings that support indoor navigation**. The amount of public buildings that support indoor navigation will demonstrate the use of innovative technologies in infrastructures, offering possibilities for the deployment of innovative ICT services for indoor navigation.
- **Percentage of public infrastructures (public buildings, buses, parkings, transport systems, etc) equipped with NFC systems.** The amount of infrastructures that are equipped with NFC systems will accelerate the deployment and uptake of new innovative ICT services.
- **Percentage of public infrastructures (public buildings, buses, parkings, etc.) equipped with smart cameras.** The amount of infrastructures that are equipped with smart cameras will accelerate the deployment and uptake of new innovative ICT services.
- **Percentage of public infrastructures (public buildings, buses, parkings, etc) equipped with sensors.** The amount of infrastructures that are equipped with sensors will accelerate the deployment and uptake of new innovative ICT services.

4.4 Smart Governance

Smart Governance relates to the role of public authorities in order to push the innovation process in the Smart City further. It also relates to the level of transparent governance through innovative technologies and the accessibility of data. Smart Governance also refers to the use of technologies in order to facilitate high quality public and social services from authorities. This can have a wide range from the use of ICT technologies for better health services, education, transport, tourism, etc

Indicator: Transparent data
Rationale: The availability of different types of data makes it possible to base new innovative ICT services and the creation of a data model, one of the main objectives of the PEOPLE project. Public authorities have a large amount of data available that can be used effectively, such as measurements on the quality of air, touristic information, public transport information, health information, etc. that can be exploited through new business perspectives.
Measurement:

- **Amount of data available from public authorities that can be used effectively for new services.** This measurement will give a clear view on public data that is available for free or for compensation in

order to design new ICT services based on this information. These new services will actively stimulate smart governance, smart economy and the smart city in general.

- **Number of project services that use open data.** This indicator reflects the actual use of the open data in the project and for the deployment of the ICT services.

Indicator: Innovative public policy

Rationale: Effective public policy to stimulate innovation in a city will have a large impact on the level of smartness in a city. Policy is essential for making the transaction to a knowledge based economy, as well as for improving production technologies and stimulating growth.

Measurement:

- **Amount of public R&D expenditures as percentage of overall expenditures of a city.** This measurement will define all R&D expenditures of the government sector in a city and the higher education sector. R&D expenditures is one of the main tools of public policy to drive innovation processes and provides therefore key indications on the level of public involvement to stimulate the smart city.

Indicator: Smart public services

Rationale: The indicator relates to governments commitment to offer more effective and efficient public services, through innovative technologies. Governments can make administrative processes easier for citizens and businesses through online applications and transactions. This will at the same time improve data quality as more information is validated online directly. Smart cards can be used to safely identify users of public services and facilitate payments and control. This will have effects on all dimensions related to the Smart City, such as Smart Governance, Smart Economy, Smart Citizens and Smart Infrastructures.

Method of measurement:

- **Number of project´s ICT services that solve or complement public services:** Large part of ICT services solve problems related to public services, such as in education and transportation. Other services solve more general issues, like those for social integration or local resource management. The number of services directly improving education, health services, transport services, etc. is an indicator of the spreading of ICT services into the public domain.

Indicator: Public governance implication

Rationale: The implication of public authorities in progress of Smart Cities is of crucial importance. Public authorities and decision makers can facilitate the deployment of ICT services, set regulations for their use and provide for a wider dissemination towards citizens. This indicator therefore demonstrates the level of integration of ICT services and smart governance in the smart city and shows the acceptance by its decision makers.

Method of measurement:

- **Number of public organizations and department involved** : this measurement will indicate the level participation and acceptance of public authorities through their direct involvement in the project.
- **Number of public organizations and departments that use the project´s ICT service**. By measuring the amount of organizations and departments that actually use the service, whether it is as a data provider, administrator or user gives a clear indication on the level of acceptance.

4.5 Citizens in Smart Cities

The dimension of Smart Citizens relates to the use of innovative technologies by citizens. The use of innovative technologies must be first defined by the access that citizens have to these technologies. Then the level of involvement in the innovation process must be measured in order to define the citizens contribution in the push towards further smartness in the pilots and Smart Cities. Also the level of implication in the governance process must be defined in order to have an indication on the involvement of citizens in a city in general. Finally based on the experiences of the citizens the improvement of quality of life will be measured by asking the citizens their level of satisfaction with the different PEOPLE dimensions.

Indicator: Citizen ICT access

This indicator will indicate the level of ICT availability for citizens in the smart city in order to use the ICT services. The availability of ICT is made possible through PCs and mobile phone and requires an internet connection through broadband or through the mobile phone. This is considered as a prerequisite in order to define the impact on the smart city.

Method of measurement:

- **Percentage of citizens that have an internet subscription.**

Indicator: Citizens and ICT services

Rationale: High citizens' participation levels give an indication on the level of engagement of citizens in the Smart City concept. ICT services can facilitate the citizen participation through offering platforms for opinion sharing and to hear new proposals. Interactions with citizens are opportunities to share information and improve lives. The user driven methodology will imply a higher involvement of citizens to enable design and ICT services to be more citizens-centric and aligned with their real needs. Citizens need to be both more demanding and more willing to get involved in the design process.

Method of measurement:

- **Amount of citizens that participate in the project,** by giving requirements, feedback or any type of suggestion regarding ICT services. This measurement will analyze the level of implication of citizens in driving the Smart City and determine the level of implication of the user driven methodology in the project. .
- **Amount of citizens using the project ICT services.** This measurement indicates the role of the citizens in the innovation lifecycle by analyzing whether citizens are using the ICT service that are the result of the project for their daily activities.
    - Amount of citizens using the projects ICT services for the Smart Economy (virtual marketplace, smart scheduler).
    - Amount of citizens using ICT services for Smart Infrastructures. (Intelligent bus stops, parking service, indoor navigation, access control NFC, Hosrespiro)
    - Amount of citizens using ICT services for Smart Governance (Citizen´s portal, 3D tourism, courses.
- **Amount of citizens that used the ICT services more than once:** This indicator will demonstrate the level of interest of citizens to repeat the use of the ICT service.

- **Amount of time that citizens are using the ICT services:** This indicator will demonstrate the level of interest of citizens in a service by measuring the amount of time they spend in using it.

Indicator: Citizens level of satisfaction

Rationale: The final objective of the Smart City can be defined as the improvement of life of citizens. A smart City makes a conscious effort to use innovative ICT based solutions to improve conditions of living and working and to support a more inclusive and sustainable urban environment.ICT can be used as a tool to ameliorate daily life, through better public services, a healthier economy and more convenient transport. Quality of life is defined here through the level of satisfaction with the ICT services deployed

Measurement:

- **Citizens´ level of satisfaction with ICT services:** this measurement will be given through a survey after and will give an idea on the impact of the ICT services. Depending on the service the survey would consist of some questions related to the user friendliness, the innovativeness, the quality and whether the service would be recommended to colleagues and friends.
- **Citizens´ perception on impact of innovative services on quality of life:** this measurement will show whether citizens perceive that the project´s ICT services have an impact on their quality of life, i.e. makes certain aspects, tasks or activities easier and facilitates an added value to their daily activities.
- **ICT success rate:** the amount of offers, search and uses that ended with a positive results, i.e. offers that had a demand and requests that were met. This will demonstrate the impact of the service and its effectiveness, making it possible to compare this with the citizens' level of satisfaction.
  - **Success rate through surveys**
  - **Success rate through web analytics**
  - **Success rate through other measurements**

4.6 Final Scoreboard Schema

№	Smart Economy	Relating to which project objective	Method of measurement
1	Businesses in Smart Cities	Businesses in the EU are the key driver for economic growth, innovation, employment and social integration. The project has the objective to improve the competitiveness of businesses in the Smart Cities through the use of innovative ICT. Therefore this indicator will demonstrate the impact of the uptake of innovative technologies and services by businesses in order to increase productivity and revenue.	Number of companies involved in the project (pilot).
			Number of businesses adopting or using the projects ICT services as part of their activity.
2	Smart Services and Products	The objective of the project is to end with a portfolio of ICT services that are really integrated, composed, adapted and deployed, based on the city's most important needs, challenges and priorities. These services use the data coming from the urban ecosystem into which they are implemented. The services are focused on overcoming/alleviating some of the critical challenges faced by cities nowadays that will make participant citizens perceive that they live better, demonstrating the advantages of the internet-based services deployed and of smart cities (and gearing cultural change towards their uptake	Number of developed and conceptualized commercial services that can be transferred/uptaken by businesses.
3	Innovative entrepreneurship	The objective of the PEOPLE pilots is to stimulate entrepreneurship and to improve capacities for entrepreneurs to develop, validate and integrate new ideas and rapidly scale-up for their services and products. This indicator will demonstrate the impact on the development of new ideas, services and products in the Smart Economy.	The number of licenses defined.
			Number of companies that express interest in open data availability.
			Number of innovative technological business registrations based on the project results.
			Number of entrepreneurs using the project´s ICT services.
№	Smart Infrastructures	Relating to which project objective	Method of measurement
4	ICT infrastructures	The availability of ICT infrastructures, such as broadband access, DSL, FTTH and wi-fi is in many cases a condition for the use of innovative and inclusive ICT services across the Smart City. The availability of ICT infrastructures accelerates the development of a sustainable, competitive, innovative and inclusive information society. The indicator on ICT infrastructures will therefore give	Percentage of the city area covered by public wifi access.
			Percentage of area covered by UMTS.
			Percentage of area covered by LTE.

		a direct image of Smartness of Cities	
5	Smart Transport	Traffic congestions and the sustainability agenda has brought renewed focus on public transport (buses, trains, metro, etc.) utilization in cities. Access to high quality information is of increasing importance as the transport becomes ever more dense, giving more control to the users and enable them to make decisions about the commute, helping them to manage their time and experience. ICT technologies facilitate payments, give mobile and station based information on transport and durations and improve the quality of transport.	Amount of innovative ICT services that facilitate transport in the city.
6	Smart Public Infrastructures	The use of innovative ICT services by public infrastructures provides for an increased amount of data. It gives the opportunity to deploy new innovative ICT services based on these smart infrastructures in smart buildings. This indicator also reflects the use of smart technologies in the smart city and the embeddedness in the society.	Percentage of public buildings that support indoor navigation.
			Percentage of public infrastructures (public buildings, buses, parkings, transport systems, etc) equipped with NFC systems.
			Percentage of public infrastructures (public buildings, buses, parkings, etc.) equipped with smart cameras.
			Percentage of public infrastructures (public buildings, buses, parkings, etc) equipped with sensors.
№	Smart Governance	Relating to which project objective	Method of measurement
7	Transparent data	The availability of different types of data makes it possible to base new innovative ICT services and the creation of a data model, one of the main objectives of the PEOPLE project. Public authorities have a large amount of data available that can be used effectively, such as measurements on the quality of air, touristic information, public transport information, health information, etc. that can be exploited through new business perspectives.	Amount of data available from public authorities that can be used effectively for new services
			Number of project services that use open data.
8	Innovative public policy	Effective public policy to stimulate innovation in a city will have a large impact on the level of smartness in a city. Policy is essential for making the transaction to a knowledge based economy, as well as for improving production technologies and stimulating growth.	Amount of public R&D expenditures as percentage of overall expenditures of a city
9	Smart public	The indicator relates to governments commitment	Number of project´s ICT services

	services	to offer more effective and efficient public services, through innovative technologies. Governments can make administrative processes easier for citizens and businesses through online applications and transactions. This will at the same time improve data quality as more information is validated online directly. Smart cards can be used to safely identify users of public services and facilitate payments and control. This will have effects on all dimensions related to the Smart City, such as Smart Governance, Smart Economy, Smart Citizens and Smart Infrastructures.	that solve or complement public services:
10	Public governance implication	The implication of public authorities in progress of Smart Cities is of crucial importance. Public authorities and decision makers can facilitate the deployment of ICT services, set regulations for their use and provide for a wider dissemination towards citizens. This indicator therefore demonstrates the level of integration of ICT services and smart governance in the smart city and shows the acceptance by its decision makers.	Number of public organizations and department involved Number of public organizations and departments that use the project´s ICT service
№	Citizens in Smart Cities	Relating to which project objective	Method of measurement
11	Citizen ICT access	This indicator will indicate the level of ICT availability for citizens in the smart city in order to use the ICT services. The availability of ICT is made possible through PCs and mobile phone and requires an internet connection through broadband or through the mobile phone. This is considered as a prerequisite in order to define the impact on the smart city.	Percentage of citizens that have an internet subscription.
12	Citizens and ICT services	High citizens' participation levels give an indication on the level of engagement of citizens in the Smart City concept. ICT services can facilitate the citizen participation through offering platforms for opinion sharing and to hear new proposals. Interactions with citizens are opportunities to share information and improve lives. The user driven methodology will imply a higher involvement of citizens to enable design and ICT services to be more citizens-centric and aligned with their real needs. Citizens need to be both more demanding and more willing to get involved in the design process.	Amount of citizens that participate in the project Amount of citizens using the project ICT services. Amount of citizens that used the ICT services more than once Average amount of time that citizens are using the ICT services
13	Citizens level of satisfaction	The final objective of the Smart City can be defined as the improvement of life of citizens. A smart City makes a conscious effort to use innovative ICT	Citizens´ level of satisfaction with ICT services

	based solutions to improve conditions of living and working and to support a more inclusive and sustainable urban environment.ICT can be used as a tool to ameliorate daily life, through better public services, a healthier economy and more convenient transport. Quality of life is defined here through the level of satisfaction with the ICT services deployed	Citizens´ perception on impact of innovative services on quality of life
		ICT success rate

5. Data collection and processing framework

5.1 Data collection

The corresponding data related to the indicators will be acquired through various channels depending on the nature of the indicator. The following channels have been identified and will be used to collect data:

Desk top research

It is expected that some of the data for the scoreboard will be acquired through desktop research, analyzing primary and secondary data from different sources of statistical data. The advantage is that this data is easy accessible, as there exists a large variety of public databases with a large variety of information. However in many cases this information is not always updated and demonstrates normally data of a year. Additionally it is very difficult to connect this data to the specific objectives and impact of the project, as these will only show an impact on the long term. In order to confront these disadvantages the following actions will be undertaken:

- The obtainment of this data will be automatic through data mining tools, making it possible to reflect in a very short time range the changes in the scoreboard.
- Various data sources will be analyzed and compared on different levels (European, national and local).

The Eurostat database that covers a large amount of topics such as population, economy and technology is one of these data sources. However it is expected that a more updated and precise information related to the PEOPLE objectives can be found in local databases. In Bilbao a good example for the obtainment of local statistical information is Geobilbao portal (www.geobilbao.net) where the City Council is collecting relevant information on the Smart City with specific information on the deployment of ICT infrastructures, transport and environment. For Thermi an important source of data is the Watch System of the Greek Ministry of Regional Development and Competitiveness with free and online information on the economy, infrastructures, etc.

It is expected that a large part of this data obtainment can be automated through data mining techniques, making it possible to obtain an update view on the indicator on a continuous basis. Data sources will be consulted at European, national and local level.

Survey research

Survey analysis is one of the most commonly used research methods. Scholars, market researchers and organizations of all sizes use surveys to measure public opinion, gauge customer satisfaction and study a wide range of social and cultural issues. Through the use of surveys in PEOPLE data will be obtained on the level of satisfaction of citizens, companies and other stakeholders. The aim is to maintain small and concrete surveys focused on a specific objective related to the scoreboard in order to obtain responses with statistical value. These surveys will be mainly obtained through the internet, linked to the ICT service, making it possible to receive answers from users on the service, while the actual use is still fresh in mind. The surveys will be developed with online survey tools such as http://www.netq-survey.co.uk/ and http://www.surveybuilder.com/. These tools will permit for the design of the survey and the gathering of the data that is generated. In annex 1 some simple surveys are defined for the Citizens´ level of satisfaction.

The information obtained from the surveys will be treated with some basic statistical techniques to analyze the data drawn from the surveys and fit them into the scoreboard.

Data gathering tools

Also there will be different tools used for the monitoring of services use, such as data logging and social networks. This information will be generated automatically on a continuous basis, giving a good overview of the use of the ICT services and its effectiveness from the end-users themselves.

Most of the deployed ICT services will require log-in information by registered users; this will give initial information on the profile of the user (company, public administration, citizens, etc.) Log files of the services will only be used up to a limited level for this purpose, taking into account ethical principles in the use of this information.

For a more in debt analysis of the use of the ICT services the pilots will use Piwik http://piwik.org/ a downloadable, open source real time web analytics software program. This tool provides detailed reports on the visitors, search engines, keywords, languages, amount of use, etc. It is a program that can be easily installed easily on the web server and permits for the use of the ICT services with reports generated in real time.

5.2 Data processing

Different **statistical and database tools** will be used to gather the collected data and process it during the project. The **PEOPLE Wiki** will also store other project results such as outcomes from benchmarking activities. Therefore, it will compile most of the knowledge generated during the project (vertical and cross-pilot). In terms of the relevance for the scoreboard, an analysis of such indicators, their values, evolution and knowledge compiled will be carried out in order to identify relevant factors to be included and monitored through the Scoreboard. The final scoreboard will be published on the Wiki, as public information, accessible as a tool for businesses and policy makers.

To compare the different indicators and their evolvement during the project life and after, it is necessary to **standardize** the values. One method, which has been also applied by the Vienna Centre of Regional Sciences, to standardize is by z- transformation (see figure 2).[12] The z-transformation is a linear transformation that transforms a raw score to a Z-score. Regardless of what the raw score values are, the Z-transformation will provide a standard measure. This method transforms all indicator values into standardized values with an average 0 and a standard deviation 1. It has the advantage to consider the heterogeneity within groups and maintain its metric information. Furthermore a high sensitivity towards changes is achieved. This method will especially be interesting in order to compare the four PEOPLE pilots between each other and define synergies in the PEOPLE project.

[12] Vienna Centre of Regional Science, *Smart Cities: ranking of European medium sized cities*, www.smart-cities.eu, (2007), 5

$$z = \frac{X - \mu}{\sigma}$$

- 7 Formula of the Z-transformation

For statistical calculations different tools will be used, according to their level of usefulness. An example is SISA (Simple Interactive Statistical Analysis http://www.quantitativeskills.com/sisa/), a simple method for doing common statistical calculations on the internet. The result is instantly displayed, accompanied by any relevant charts and graphs. SISA also displays any information that may be relevant to the results, such as possible data errors that may invalidate the results

5.3 Pilot differences

By defining the PEOPLE scoreboard methodology jointly amongst all pilots, leveraging the joint knowledge with an emphasis in the specification of requirements for collaborative innovation and identifying opportunities for interconnecting Pilots (sharing data model(s) and databases, setting communications between hardware components and/or infrastructures, transferring services from one Pilot to the other, etc.), interesting results are expected regarding impact assessment of ICT services on Smart Cities.
Therefore the objective is to define one single scoreboard that can be used to define the impact obtained in relation to Smart Cities in the four different pilots. Each pilot has specific characteristics and services. This means that some indicators will be more appropriate for a pilot than others. It is expected that especially this difference in services and characteristics will give interesting feedback on the scoreboard results, making it possible to have further far reaching conclusions on the pilots as Smart Cities.
Therefore there will be intensive synergies between the pilots for the definition of the scoreboard and at the end of the project the impact can be defined in each pilot with a single tool, demonstrating the specific characteristics of the pilots but also the synergies. Through the comparison between the cities it will be possible to determine the impact of specific services.
By means of weightings, the relative importance of a set of indicators can be given, in order to reflect the pilot priorities, having a direct impact on the results. Each pilot can prioritize one set of indicators that are considered a priority with a high weighting and one set of indicators that are considered as no priority at all with a low weighting. The other indicators are considered as normal indicators and will be weighted normally. Based on the outcomes the impact of the PEOPLE project and services can be measured.

6. Data Gathering mechanisms per Pilot

6.1 Introduction

Following the framework previously defined the different PEOPLE's Pilot have define its strategy in order to gather the values of the different indicators included in the Scoreboard. In the next version of this deliverable (D3.1.4) the actual values for the Scoreboard Indicators will be gathered. In this section we will present the strategy that the different Pilots will follow in order to obtain these values following the framework defined in D3.1.2.

6.2 Bilbao

Smart Economy

The Smart Economy dimension in the PEOPLE Scoreboard uses smartness and innovative technologies to stimulate further progress in the economy related to entrepreneurship, businesses, innovation and labor flexibility. These following indicators of the Smart Economy will be measured:

Indicator: Businesses in Smart Cities

Rationale: Businesses in the EU are the key driver for economic growth, innovation, employment and social integration. The project has the objective to improve the competitiveness of businesses in the Smart Cities through the use of innovative ICT. Therefore this indicator will demonstrate the impact of the uptake of innovative technologies and services by businesses in order to increase productivity and revenue.

Measurement:

- **Number of companies involved in the project (pilot).**

  Description

  The amount of companies that are using the ICT services for their activities will demonstrate the acceptance of the concept among businesses. The amount of businesses that are involved in the pilot through different ways, giving feedback and requirements, will express the degree of influence of the companies on the service creation and improvement.

  Means of Gathering

  Desktop Research: Bilbao services are oriented to citizens and visitors. Companies are indirectly involved by the services scope, mainly in tourism activities. A list of travel agencies and hotels can be found in http://www.bilbao.net/bilbaoturismo/. Additionally EUSTAT offers the data of number of commerce companies in Bilbao. (www.eustat.es). An automatic data mining of these information sources can be obtain though the information provided by www.eustat.es and www.bilbao.net/bilbaoturismo/

- **Number of businesses adopting or using the projects ICT services as part of their activity.**

Description

This measurement will give an indication on the acceptance of businesses of the Smart City concept and innovative ICT services.

Means of Gathering

Desktop Research: Statistical data is provided by EUSTAT: http://www.eustat.es/elementos/ele0004300/ti_Establecimientos_Innovadores_y_establecimientos_EIN_del_sector_TIC_por_territorio_historico_y_subsectores_2007-2009/tbl0004386_c.html#axzz27OcDzZB6 and can be used for implementing an automatic data mining of these information.

Indicator: Smart Services and Products

Rationale: The objective of the project is to end with a portfolio of ICT services that are really integrated, composed, adapted and deployed, based on the city's most important needs, challenges and priorities. These services use the data coming from the urban ecosystem into which they are implemented. The services are focused on overcoming/alleviating some of the critical challenges faced by cities nowadays that will make participant citizens perceive that they live better, demonstrating the advantages of the internet-based services deployed and of smart cities (and gearing cultural change towards their uptake)[13].

Measurement:

- **Number of developed and conceptualized commercial services that can be transferred/uptaken by businesses.**

  Description

  The number of conceptualized commercial services that are collected by the project and that have a business model can be scaled up by companies, demonstrating an impact on the Smart Economy of the Smart City.

  Means of Gathering

  Desktop Research People services catalogue developed as open source projects can be transferred/uptaken by businesses. The Data base available for obtaining this information is the People services catalogue.

Indicator: Innovative entrepreneurship

Rationale: The objective of the PEOPLE pilots is to stimulate entrepreneurship and to improve capacities for entrepreneurs to develop, validate and integrate new ideas and rapidly scale-up for their services and

[13] DoWv4, page 7.

products. This indicator will demonstrate the impact on the development of new ideas, services and products in the Smart Economy.

Measurement:

- **The number of licenses defined**.

  Description

  In order to measure the level of entrepreneurship of the results of the project and the capacities to develop new products and services based on these results that will determine the competitive advantage and the progress in the Smart Economy, the number of protective measures that have been defined in the Smart Cities as a result from the project.

  Means of Gathering

  Desktop Research There isn't available a database containing this information. Services are released under open licenses.

- **Number of companies that express interest in open data availability.**

  Description

  The number of companies that express interest in open data availability through the project demonstrates the potential for further innovative entrepreneurship. It reflects the level of exploitability of the results of the project and its interest towards businesses. This will constitute an impact on the smart economy and the smart city in general.

  Means of Gathering

  Desktop Research There isn't available a database containing this information. Services are released under open licenses.

- **Number of innovative technological business registrations based on the project results.**

  Description

  In order to define the level of innovative entrepreneurship, the new business registrations over a certain period will be analyzed that can be linked directly to the results of the project. A higher share of innovative new companies reflects a higher level of innovative activities and a smarter economy.

  Means of Gathering

  Desktop Research There isn't available a database containing this information. Services are released under open licenses.

- **Number of entrepreneurs using the project´s ICT services**:

  Description

  This indicator looks at the activity of individuals in the Smart Economy, using ICT services to offer their professional services and to look for commercial collaboration.

Means of Gathering

Desktop Research There isn't available a database containing this information. Services are released under open licenses.

Smart Infrastructures

The Infrastructure dimension in the PEOPLE Scoreboard refers both to transport infrastructures and to ICT infrastructures, giving a complete overview of the effects of ICT services on these different types of infrastructures.

Indicator: ICT infrastructures

Rationale: The availability of ICT infrastructures, such as broadband access, DSL, FTTH and wi-fi is in many cases a condition for the use of innovative and inclusive ICT services across the Smart City. The availability of ICT infrastructures accelerates the development of a sustainable, competitive, innovative and inclusive information society. The indicator on ICT infrastructures will therefore give a direct image of Smartness of Cities.

Measurement:

- **Percentage of the city area covered by public wifi access.**

  Description

  This measurement will give a clear picture on the availability of ICT infrastructures across a city, facilitated by public authorities and private companies. It does not look at the amount of users that have access to internet through their private internet access, which is covered for in the dimension on smart citizens.

  Means of Gathering

  Desktop Research Data Base of City Council for free WIFI access can be found in: http://www.bilbao.net/cs/Satellite?cid=3000022983&language=es&pagename=Bilbaonet%2FPage%2FBIO_contenidoFinal and can be used for automatically gathering the data.

- **Percentage of area covered by UMTS.**

  Description

  This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.

  Means of Gathering

  Desktop Research This information will be obtained through coverage indicators provided by CMT via periodic reports**.**

- **Percentage of area covered by LTE.**

  Description

  This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.

  Means of Gathering

  Desktop Research This information will be obtained through coverage indicators provided by CMT via periodic reports**.**

Indicator: Smart Transport

Rationale: Traffic congestions and the sustainability agenda has brought renewed focus on public transport (buses, trains, metro, etc.) utilization in cities. Access to high quality information is of increasing importance as the transport becomes ever more dense, giving more control to the users and enable them to make decisions about the commute, helping them to manage their time and experience. ICT technologies facilitate payments, give mobile and station based information on transport and durations and improve the quality of transport.

Measurement:

- **Amount of innovative ICT services that facilitate transport in the city.**

Description

The amount of ICT services resulting from the project that facilitate transport can consist of real time information facilities, automatic payments, intelligent bus stops, etc. and demonstrate the impact on the smart infrastructure of the city.

Means of Gathering

Desktop Research Not such data base available. ICT services research will be done manually.

Indicator: Smart Public Infrastructures:

Rationale: The use of innovative ICT services by public infrastructures provides for an increased amount of data. It gives the opportunity to deploy new innovative ICT services based on these smart infrastructures in smart buildings. This indicator also reflects the use of smart technologies in the smart city and the embeddedness in the society.

Measurement:

- **Percentage of public buildings that support indoor navigation**.

Description

The amount of public buildings that support indoor navigation will demonstrate the use of innovative technologies in infrastructures, offering possibilities for the deployment of innovative ICT services for indoor navigation.

Means of Gathering

Desktop Research Not such data base available. ICT services research will be done manually.

- **Percentage of public infrastructures (public buildings, buses, parkings, transport systems, etc) equipped with NFC systems.**

Description

The amount of infrastructures that are equipped with NFC systems will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research Not such data base available. ICT services research will be done manually.

- **Percentage of public infrastructures (public buildings, buses, parkings, etc.) equipped with smart cameras.**

Description

The amount of infrastructures that are equipped with smart cameras will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research Not such data base available. ICT services research will be done manually.

- **Percentage of public infrastructures (public buildings, buses, parkings, etc) equipped with sensors.**

Description

The amount of infrastructures that are equipped with sensors will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research Not such data base available. ICT services research will be done manually.

Smart Governance

Smart Governance relates to the role of public authorities in order to push the innovation process in the Smart City further. It also relates to the level of transparent governance through innovative technologies and the accessibility of data. Smart Governance also refers to the use of technologies in order to facilitate high quality public and social services from authorities. This can have a wide range from the use of ICT technologies for better health services, education, transport, tourism, etc

Indicator: Transparent data

Rationale: The availability of different types of data makes it possible to base new innovative ICT services and the creation of a data model, one of the main objectives of the PEOPLE project. Public authorities have a large amount of data available that can be used effectively, such as measurements on the quality of air, touristic information, public transport information, health information, etc. that can be exploited through new business perspectives.

Measurement:

- **Amount of data available from public authorities that can be used effectively for new services.**

Description

This measurement will give a clear view on public data that is available for free or for compensation in order to design new ICT services based on this information. These new services will actively stimulate smart governance, smart economy and the smart city in general.

Means of Gathering

Desktop Research. This information can be obtained from the Euskadi open data infrastructure (http://opendata.euskadi.net). This information can be gathered automatically

- **Number of project services that use open data.**

Description

This indicator reflects the actual use of the open data in the project and for the deployment of the ICT services.

Means of Gathering

Desktop Research. This information will be obtained from the catalogue of PEOPLE services.

Indicator: Innovative public policy

Rationale: Effective public policy to stimulate innovation in a city will have a large impact on the level of smartness in a city. Policy is essential for making the transaction to a knowledge based economy, as well as for improving production technologies and stimulating growth.

Measurement:

- **Amount of public R&D expenditures as percentage of overall expenditures of a city.**

Description

This measurement will define all R&D expenditures of the government sector in a city and the higher education sector. R&D expenditures is one of the main tools of public policy to drive innovation processes and provides therefore key indications on the level of public involvement to stimulate the smart city.

Means of Gathering

Desktop Research. There isn't a database containing this Information. It will be gathered from reports elaborated by public authorities.

Indicator: Smart public services

Rationale: The indicator relates to governments commitment to offer more effective and efficient public services, through innovative technologies. Governments can make administrative processes easier for citizens and businesses through online applications and transactions. This will at the same time improve data quality as more information is validated online directly. Smart cards can be used to safely identify users of public services and facilitate payments and control. This will have effects on all dimensions related to the Smart City, such as Smart Governance, Smart Economy, Smart Citizens and Smart Infrastructures.

Measurement:

- **Number of project´s ICT services that solve or complement public services:**

Description

Large part of ICT services solve problems related to public services, such as in education and transportation. Other services solve more general issues, like those for social integration or local resource management. The number of services directly improving education, health services, transport services, etc. is an indicator of the spreading of ICT services into the public domain.

Means of Gathering

Desktop Research. This information will be obtained from the catalogue of PEOPLE services.

Indicator: Public governance implication

Rationale: The implication of public authorities in progress of Smart Cities is of crucial importance. Public authorities and decision makers can facilitate the deployment of ICT services, set regulations for their use and provide for a wider dissemination towards citizens. This indicator therefore demonstrates the level of integration of ICT services and smart governance in the smart city and shows the acceptance by its decision makers.

Measurement:

- **Number of public organizations and department involved**:

Description

This measurement will indicate the level participation and acceptance of public authorities through their direct involvement in the project.

Means of Gathering

Desktop Research. This information can be obtained from Report on Stakeholders activation (D1.1.x)

- **Number of public organizations and departments that use the project´s ICT service**.

Description

By measuring the amount of organizations and departments that actually use the service, whether it is as a data provider, administrator or user gives a clear indication on the level of acceptance.

Means of Gathering

Desktop Research. This information can be obtained from Report on Stakeholders activation (D1.1.x)

Citizens in Smart Cities

The dimension of Smart Citizens relates to the use of innovative technologies by citizens. The use of innovative technologies must be first defined by the access that citizens have to these technologies. Then the level of involvement in the innovation process must be measured in order to define the citizens contribution in the push towards further smartness in the pilots and Smart Cities. Also the level of implication in the governance process must be defined in order to have an indication on the involvement of citizens in a city in general. Finally based on the experiences of the citizens the improvement of quality of life will be measured by asking the citizens their level of satisfaction with the different PEOPLE dimensions.

Indicator: Citizen ICT access

This indicator will indicate the level of ICT availability for citizens in the smart city in order to use the ICT services. The availability of ICT is made possible through PCs and mobile phone and requires an internet connection through broadband or through the mobile phone. This is considered as a prerequisite in order to define the impact on the smart city.

Measurement:

- **Percentage of citizens that have an internet subscription.**

Means of Gathering

Desktop Research This information will be obtained through coverage indicators provided by CMT via periodic reports**.**

Indicator: Citizens and ICT services

Rationale: High citizens' participation levels give an indication on the level of engagement of citizens in the Smart City concept. ICT services can facilitate the citizen participation through offering platforms for opinion sharing and to hear new proposals. Interactions with citizens are opportunities to share information and improve lives. The user driven methodology will imply a higher involvement of citizens to enable design and ICT services to be more citizens-centric and aligned with their real needs. Citizens need to be both more demanding and more willing to get involved in the design process.

Measurement:

- **Amount of citizens that participate in the project,**

Description

by giving requirements, feedback or any type of suggestion regarding ICT services. This measurement will analyze the level of implication of citizens in driving the Smart City and determine the level of implication of the user driven methodology in the project. .

Means of Gathering

Desktop Research. This information can be obtained from Report on Stakeholders activation (D1.1.x)

- **Amount of citizens using the project ICT services.**

Description

This measurement indicates the role of the citizens in the innovation lifecycle by analyzing whether citizens are using the ICT service that are the result of the project for their daily activities.

  - Amount of citizens using the projects ICT services for the Smart Economy (virtual marketplace, smart scheduler).
  - Amount of citizens using ICT services for Smart Infrastructures. (Intelligent bus stops, parking service, indoor navigation, access control NFC, Hoyrespiro)
  - Amount of citizens using ICT services for Smart Governance (Citizen´s portal, 3D tourism, courses.

Means of Gathering

Desktop Research. This information can be obtained from Report on Stakeholders activation (D1.1.x)

Indicator: Citizens level of satisfaction

Rationale: The final objective of the Smart City can be defined as the improvement of life of citizens. A smart City makes a conscious effort to use innovative ICT based solutions to improve conditions of living and working and to support a more inclusive and sustainable urban environment.ICT can be used as a tool to ameliorate daily life, through better public services, a healthier economy and more convenient transport. Quality of life is defined here through the level of satisfaction with the ICT services deployed

Measurement:

- **Citizens´ level of satisfaction with ICT services:**

Description

This measurement will be given through a survey after and will give an idea on the impact of the ICT services. Depending on the service the survey would consist of some questions related to the user friendliness, the innovativeness, the quality and whether the service would be recommended to colleagues and friends.

Means of Gathering

Survey Research. By surveys embedded in the PEOPLE Services

- **Citizens´ perception on impact of innovative services on quality of life:**

Description

This measurement will show whether citizens perceive that the project´s ICT services have an impact on their quality of life, i.e. makes certain aspects, tasks or activities easier and facilitates an added value to their daily activities.

Means of Gathering

Survey Research. By surveys embedded in the PEOPLE Services

- **ICT success rate:**

Description

The amount of offers, search and uses that ended with a positive results, i.e. offers that had a demand and requests that were met. This will demonstrate the impact of the service and its effectiveness, making it possible to compare this with the citizens' level of satisfaction.

Means of Gathering

Desktop Research Not such data base available. This research will be done manually.

6.3 Vitry sur Seine

Smart Economy

The Smart Economy dimension in the PEOPLE Scoreboard uses smartness and innovative technologies to stimulate further progress in the economy related to entrepreneurship, businesses, innovation and labor flexibility. These following indicators of the Smart Economy will be measured:

Indicator: Businesses in Smart Cities

Rationale: Businesses in the EU are the key driver for economic growth, innovation, employment and social integration. The project has the objective to improve the competitiveness of businesses in the Smart Cities through the use of innovative ICT. Therefore this indicator will demonstrate the impact of the uptake of innovative technologies and services by businesses in order to increase productivity and revenue.

Measurement:

- **Number of companies involved in the project (pilot).**

  Description

The amount of companies that are using the ICT services for their activities will demonstrate the acceptance of the concept among businesses. The amount of businesses that are involved in the pilot through different ways, giving feedback and requirements, will express the degree of influence of the companies on the service creation and improvement.

Means of Gathering

Survey Research: Surveying companies that are interested or testing the pilot services

Data Gathering Tools: Collecting the data from comments on Facebook pilot page

- **Number of businesses adopting or using the projects ICT services as part of their activity.**

  Description

  This measurement will give an indication on the acceptance of businesses of the Smart City concept and innovative ICT services.

  Means of Gathering

  Survey Research: Surveying companies that are using the pilot services

Indicator: Smart Services and Products

Rationale: The objective of the project is to end with a portfolio of ICT services that are really integrated, composed, adapted and deployed, based on the city's most important needs, challenges and priorities. These services use the data coming from the urban ecosystem into which they are implemented. The services are focused on overcoming/alleviating some of the critical challenges faced by cities nowadays that will make participant citizens perceive that they live better, demonstrating the advantages of the internet-based services deployed and of smart cities (and gearing cultural change towards their uptake)[14].

Measurement:

- **Number of developed and conceptualized commercial services that can be transferred/uptaken by businesses.**

  Description

  The number of conceptualized commercial services that are collected by the project and that have a business model can be scaled up by companies, demonstrating an impact on the Smart Economy of the Smart City.

  Means of Gathering

  Survey Research: Surveying companies that are interested by pilot services

[14] DoWv4, page 7.

Indicator: Innovative entrepreneurship

Rationale: The objective of the PEOPLE pilots is to stimulate entrepreneurship and to improve capacities for entrepreneurs to develop, validate and integrate new ideas and rapidly scale-up for their services and products. This indicator will demonstrate the impact on the development of new ideas, services and products in the Smart Economy.

Measurement:

- **The number of licenses defined**.

  Description

  In order to measure the level of entrepreneurship of the results of the project and the capacities to develop new products and services based on these results that will determine the competitive advantage and the progress in the Smart Economy, the number of protective measures that have been defined in the Smart Cities as a result from the project.

  Means of Gathering

  Desktop Research: This information is available in PEOPLE'S deliverables.

- **Number of companies that express interest in open data availability.**

  Description

  The number of companies that express interest in open data availability through the project demonstrates the potential for further innovative entrepreneurship. It reflects the level of exploitability of the results of the project and its interest towards businesses. This will constitute an impact on the smart economy and the smart city in general.

  Means of Gathering

  Survey Research: Surveying companies.

- **Number of innovative technological business registrations based on the project results.**

  Description

  In order to define the level of innovative entrepreneurship, the new business registrations over a certain period will be analyzed that can be linked directly to the results of the project. A higher share of innovative new companies reflects a higher level of innovative activities and a smarter economy.

  Means of Gathering

  Desktop Research: This information can be obtained through the City Council.

- **Number of entrepreneurs using the project´s ICT services**:

  Description

  This indicator looks at the activity of individuals in the Smart Economy, using ICT services to offer their professional services and to look for commercial collaboration.

  Means of Gathering

  Survey Research: Surveying entrepreneurs.

Smart Infrastructures

The Infrastructure dimension in the PEOPLE Scoreboard refers both to transport infrastructures and to ICT infrastructures, giving a complete overview of the effects of ICT services on these different types of infrastructures.

Indicator: ICT infrastructures

Rationale: The availability of ICT infrastructures, such as broadband access, DSL, FTTH and wi-fi is in many cases a condition for the use of innovative and inclusive ICT services across the Smart City. The availability of ICT infrastructures accelerates the development of a sustainable, competitive, innovative and inclusive information society. The indicator on ICT infrastructures will therefore give a direct image of Smartness of Cities.

Measurement:

- **Percentage of the city area covered by public wifi access.**

  Description

  This measurement will give a clear picture on the availability of ICT infrastructures across a city, facilitated by public authorities and private companies. It does not look at the amount of users that have access to internet through their private internet access, which is covered for in the dimension on smart citizens.

  Means of Gathering

  Desktop Research Statistics will be obtained, concerning the Antena deployment from the economic department of the municipality

- **Percentage of area covered by UMTS.**

  Description

  This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.

  Means of Gathering

Desktop Research Statistics will be obtained, concerning the Antena deployment from the economic department of the municipality

Percentage of area covered by LTE.

Description

This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.

Means of Gathering

Desktop Research Statistics will be obtained, concerning the Antena deployment from the economic department of the municipality

Indicator: Smart Transport

Rationale: Traffic congestions and the sustainability agenda has brought renewed focus on public transport (buses, trains, metro, etc.) utilization in cities. Access to high quality information is of increasing importance as the transport becomes ever more dense, giving more control to the users and enable them to make decisions about the commute, helping them to manage their time and experience. ICT technologies facilitate payments, give mobile and station based information on transport and durations and improve the quality of transport.

Measurement:

- **Amount of innovative ICT services that facilitate transport in the city.**

Description

The amount of ICT services resulting from the project that facilitate transport can consist of real time information facilities, automatic payments, intelligent bus stops, etc. and demonstrate the impact on the smart infrastructure of the city.

Means of Gathering

Desktop Research This information can be obtained through the Municipality registry.

Survey Research: Surveying the Municipality

Indicator: Smart Public Infrastructures:

Rationale: The use of innovative ICT services by public infrastructures provides for an increased amount of data. It gives the opportunity to deploy new innovative ICT services based on these smart infrastructures in smart buildings. This indicator also reflects the use of smart technologies in the smart city and the embeddedness in the society.

Measurement:

- **Percentage of public buildings that support indoor navigation**.

Description

The amount of public buildings that support indoor navigation will demonstrate the use of innovative technologies in infrastructures, offering possibilities for the deployment of innovative ICT services for indoor navigation.

Means of Gathering

Desktop Research This information can be obtained through the Municipality registry.

Survey Research: Surveying the Municipality

- **Percentage of public infrastructures (public buildings, buses, parkings, transport systems, etc) equipped with NFC systems.**

Description

The amount of infrastructures that are equipped with NFC systems will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research This information can be obtained through the Municipality registry.

Survey Research: Surveying the Municipality

- **Percentage of public infrastructures (public buildings, buses, parkings, etc.) equipped with smart cameras.**

Description

The amount of infrastructures that are equipped with smart cameras will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research This information can be obtained through the Municipality registry.

Survey Research: Surveying the Municipality

- **Percentage of public infrastructures (public buildings, buses, parkings, etc) equipped with sensors.**

Description

The amount of infrastructures that are equipped with sensors will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research This information can be obtained through the Municipality registry.

Survey Research: Surveying the Municipality

Smart Governance

Smart Governance relates to the role of public authorities in order to push the innovation process in the Smart City further. It also relates to the level of transparent governance through innovative technologies and the accessibility of data. Smart Governance also refers to the use of technologies in order to facilitate high quality public and social services from authorities. This can have a wide range from the use of ICT technologies for better health services, education, transport, tourism, etc

Indicator: Transparent data

Rationale: The availability of different types of data makes it possible to base new innovative ICT services and the creation of a data model, one of the main objectives of the PEOPLE project. Public authorities have a large amount of data available that can be used effectively, such as measurements on the quality of air, touristic information, public transport information, health information, etc. that can be exploited through new business perspectives.

Measurement:

- **Amount of data available from public authorities that can be used effectively for new services.**

Description

This measurement will give a clear view on public data that is available for free or for compensation in order to design new ICT services based on this information. These new services will actively stimulate smart governance, smart economy and the smart city in general.

Desktop Research Collection of data from open databases

Survey Research: Surveying the Open Innovation communitiy

- **Number of project services that use open data.**

Description

This indicator reflects the actual use of the open data in the project and for the deployment of the ICT services.

Desktop Research This information is available in PEOPLE's deliverables

Indicator: Innovative public policy

Rationale: Effective public policy to stimulate innovation in a city will have a large impact on the level of smartness in a city. Policy is essential for making the transaction to a knowledge based economy, as well as for improving production technologies and stimulating growth.

Measurement:

- **Amount of public R&D expenditures as percentage of overall expenditures of a city.**

Description

This measurement will define all R&D expenditures of the government sector in a city and the higher education sector. R&D expenditures is one of the main tools of public policy to drive innovation processes and provides therefore key indications on the level of public involvement to stimulate the smart city.

Means of Gathering

Desktop Research Collection of the data from open databases
Survey Research: Surveying the Municipality

Indicator: Smart public services

Rationale: The indicator relates to governments commitment to offer more effective and efficient public services, through innovative technologies. Governments can make administrative processes easier for citizens and businesses through online applications and transactions. This will at the same time improve data quality as more information is validated online directly. Smart cards can be used to safely identify users of public services and facilitate payments and control. This will have effects on all dimensions related to the Smart City, such as Smart Governance, Smart Economy, Smart Citizens and Smart Infrastructures.

Measurement:

- **Number of project´s ICT services that solve or complement public services:**

Description

Large part of ICT services solve problems related to public services, such as in education and transportation. Other services solve more general issues, like those for social integration or local resource management. The number of services directly improving education, health services, transport services, etc. is an indicator of the spreading of ICT services into the public domain.

Means of Gathering

Desktop Research This information is available in PEOPLE's deliverables

Indicator: Public governance implication

Rationale: The implication of public authorities in progress of Smart Cities is of crucial importance. Public authorities and decision makers can facilitate the deployment of ICT services, set regulations for their use and provide for a wider dissemination towards citizens. This indicator therefore demonstrates the level of integration of ICT services and smart governance in the smart city and shows the acceptance by its decision makers.

Measurement:

- **Number of public organizations and department involved**:

Description

This measurement will indicate the level participation and acceptance of public authorities through their direct involvement in the project.

Means of Gathering

Survey Research: Surveying the Municipality

- **Number of public organizations and departments that use the project´s ICT service**.

Description

By measuring the amount of organizations and departments that actually use the service, whether it is as a data provider, administrator or user gives a clear indication on the level of acceptance.

Means of Gathering

Survey Research: Surveying the Municipality

Citizens in Smart Cities

The dimension of Smart Citizens relates to the use of innovative technologies by citizens. The use of innovative technologies must be first defined by the access that citizens have to these technologies. Then the level of involvement in the innovation process must be measured in order to define the citizens contribution in the push towards further smartness in the pilots and Smart Cities. Also the level of implication in the governance process must be defined in order to have an indication on the involvement of citizens in a city in general. Finally based on the experiences of the citizens the improvement of quality of life will be measured by asking the citizens their level of satisfaction with the different PEOPLE dimensions.

Indicator: Citizen ICT access

This indicator will indicate the level of ICT availability for citizens in the smart city in order to use the ICT services. The availability of ICT is made possible through PCs and mobile phone and requires an internet connection through broadband or through the mobile phone. This is considered as a prerequisite in order to define the impact on the smart city.

Measurement:

- **Percentage of citizens that have an internet subscription.**

Means of Gathering

Desktop Research Collecting the data from open databases

Indicator: Citizens and ICT services

Rationale: High citizens' participation levels give an indication on the level of engagement of citizens in the Smart City concept. ICT services can facilitate the citizen participation through offering platforms for opinion sharing and to hear new proposals. Interactions with citizens are opportunities to share information and improve lives. The user driven methodology will imply a higher involvement of citizens to enable design and ICT services to be more citizens-centric and aligned with their real needs. Citizens need to be both more demanding and more willing to get involved in the design process.

Measurement:

- **Amount of citizens that participate in the project,**

Description

by giving requirements, feedback or any type of suggestion regarding ICT services. This measurement will analyze the level of implication of citizens in driving the Smart City and determine the level of implication of the user driven methodology in the project. .

Means of Gathering

Survey research. Online survey

Data gathering tools: Collecting data from social media

- **Amount of citizens using the project ICT services.**

Description

This measurement indicates the role of the citizens in the innovation lifecycle by analyzing whether citizens are using the ICT service that are the result of the project for their daily activities.

  - Amount of citizens using the projects ICT services for the Smart Economy (virtual marketplace, smart scheduler).
  - Amount of citizens using ICT services for Smart Infrastructures. (Intelligent bus stops, parking service, indoor navigation, access control NFC, Hoyrespiro)
  - Amount of citizens using ICT services for Smart Governance (Citizen´s portal, 3D tourism, courses.

Means of Gathering

Desktop research: Extracting information from the reports of the validation activities

Survey Research. Online survey

Data gathering tools: Collecting data from social media

Indicator: Citizens level of satisfaction

Rationale: The final objective of the Smart City can be defined as the improvement of life of citizens. A smart City makes a conscious effort to use innovative ICT based solutions to improve conditions of living and working and to support a more inclusive and sustainable urban environment.ICT can be used as a tool to ameliorate daily life, through better public services, a healthier economy and more convenient transport. Quality of life is defined here through the level of satisfaction with the ICT services deployed

Measurement:

- **Citizens´ level of satisfaction with ICT services:**

Description

This measurement will be given through a survey after and will give an idea on the impact of the ICT services. Depending on the service the survey would consist of some questions related to the user friendliness, the innovativeness, the quality and whether the service would be recommended to colleagues and friends.

Means of Gathering

Desktop research: Extracting information from the reports of the validation activities

Survey Research. Online survey

Data gathering tools: Collecting data from social media

- **Citizens´ perception on impact of innovative services on quality of life:**

Description

This measurement will show whether citizens perceive that the project´s ICT services have an impact on their quality of life, i.e. makes certain aspects, tasks or activities easier and facilitates an added value to their daily activities.

Means of Gathering

Desktop research: Extracting information from the reports of the validation activities

Survey Research. Online survey

Data gathering tools: Collecting data from social media

- **ICT success rate:**

Description

The amount of offers, search and uses that ended with a positive results, i.e. offers that had a demand and requests that were met. This will demonstrate the impact of the service and its effectiveness, making it possible to compare this with the citizens' level of satisfaction.

Means of Gathering

Desktop research: Extracting information from the reports of the validation activities

Survey Research. Online survey

Data gathering tools: Collecting data from social media

6.4 Thermi

Smart Economy

The Smart Economy dimension in the PEOPLE Scoreboard uses smartness and innovative technologies to stimulate further progress in the economy related to entrepreneurship, businesses, innovation and labor flexibility. These following indicators of the Smart Economy will be measured:

Indicator: Businesses in Smart Cities

Rationale: Businesses in the EU are the key driver for economic growth, innovation, employment and social integration. The project has the objective to improve the competitiveness of businesses in the Smart Cities through the use of innovative ICT. Therefore this indicator will demonstrate the impact of the uptake of innovative technologies and services by businesses in order to increase productivity and revenue.

Measurement:

- **Number of companies involved in the project (pilot).**

  Description

  The amount of companies that are using the ICT services for their activities will demonstrate the acceptance of the concept among businesses. The amount of businesses that are involved in the pilot through different ways, giving feedback and requirements, will express the degree of influence of the companies on the service creation and improvement.

  Means of Gathering

  Desktop Research: the catalogue with the professionals which has been given by the Association of Professional Traders of Thermi. Not all of these enterprises actively participate in the project in the form of providing offers and other material but are involved in the pilot due to the information that the Association has provided to its members. The number of registered companies listed in the professional catalogue of Thermi's Virtual Marketplace. This catalogue can be use for automatically gathering this information

  Survey Research: No surveys are needed to obtain data. However for the purpose of updating the application with changes in the data of the enterprises (which occur annually or biannually), recent information should be provided by the Association of Professional Traders. This info includes the openning/closing of companies, changes in the address/name etc.

  Data Gathering Tools: all companies listed in the virtual marketplace can be registered with a unique number. The numbers of registries will provide the number of companies involved in the project. A tool counting the registries can be applied in the application.

- **Number of businesses adopting or using the projects ICT services as part of their activity.**

  Description

This measurement will give an indication on the acceptance of businesses of the Smart City concept and innovative ICT services.

Means of Gathering

Desktop Research: There is no database containing this information

Survey Research: Surveys can be used additionally to obtain further information on other characteristics of the indicator (type of business, level of ICT knowledge, level of satisfaction from the service etc). The survey can be performed online (when the business has logged-in in the service) or by e-mail.

Data Gathering Tools: Number of companies which are using the application (have logged in and submitted an offer or changed the details (description, logo etc) of their company) can be obtained through the server logs information. A tool counting the number of accounts which have been created through the application can be developed.

Indicator: Smart Services and Products

Rationale: The objective of the project is to end with a portfolio of ICT services that are really integrated, composed, adapted and deployed, based on the city's most important needs, challenges and priorities. These services use the data coming from the urban ecosystem into which they are implemented. The services are focused on overcoming/alleviating some of the critical challenges faced by cities nowadays that will make participant citizens perceive that they live better, demonstrating the advantages of the internet-based services deployed and of smart cities (and gearing cultural change towards their uptake)[15].

Measurement:

- **Number of developed and conceptualized commercial services that can be transferred/uptaken by businesses.**

  Description

  The number of conceptualized commercial services that are collected by the project and that have a business model can be scaled up by companies, demonstrating an impact on the Smart Economy of the Smart City.

  Means of Gathering

  Desktop Research: There is no statistical database, however, such information can be accessed by visiting the first page of smart city Thermi and counting the number of services that exist so far.

  Survey Research: Information can be provided by the ICT service of the municipality of Thermi

Indicator: Innovative entrepreneurship

[15] DoWv4, page 7.

Rationale: The objective of the PEOPLE pilots is to stimulate entrepreneurship and to improve capacities for entrepreneurs to develop, validate and integrate new ideas and rapidly scale-up for their services and products. This indicator will demonstrate the impact on the development of new ideas, services and products in the Smart Economy.

Measurement:

- **The number of licenses defined**.

  Description

  In order to measure the level of entrepreneurship of the results of the project and the capacities to develop new products and services based on these results that will determine the competitive advantage and the progress in the Smart Economy, the number of protective measures that have been defined in the Smart Cities as a result from the project.

  Means of Gathering

  Desktop Research: There is no statistical database. The type of licence is writen in the directory of the application but cannot be extracted automatically

- **Number of companies that express interest in open data availability.**

  Description

  The number of companies that express interest in open data availability through the project demonstrates the potential for further innovative entrepreneurship. It reflects the level of exploitability of the results of the project and its interest towards businesses. This will constitute an impact on the smart economy and the smart city in general.

  Means of Gathering

  Desktop Research: No interest has been expressed yet, and therefore, no such database exists. However, almost all of the applications create open data in the form of statistical indicators (parking and atmospheric monitoring) or complete reports (parking, improve my city, marketplace). This information could be accessed after requesting authorization from the administrator. This information can be automatically gathered by counting the number of companies requested authorization to download data and reports by the applications.

  Data Gathering Tools: All interested parties in accessing the open data produced by the applications will have to fill in a predetermined form describing their identity (companies/individuals) and the way they intend to use the data. A tool that will count the number of requests expressed by companies can be developed

- **Number of innovative technological business registrations based on the project results.**

  Description

In order to define the level of innovative entrepreneurship, the new business registrations over a certain period will be analyzed that can be linked directly to the results of the project. A higher share of innovative new companies reflects a higher level of innovative activities and a smarter economy.

Means of Gathering

Desktop Research: There is no database containing this information

Survey Research: This information can be obtained only through surveys

Data Gathering Tools: There is no way to obtain this information in an automatic way.

- **Number of entrepreneurs using the project´s ICT services**:

  Description

  This indicator looks at the activity of individuals in the Smart Economy, using ICT services to offer their professional services and to look for commercial collaboration.

  Means of Gathering

  Desktop Research: There is no such statistical database. There is no enterprise using the ICT services, however, there is a research unit of CERTH which has used the improve my city code and has developed a mobile version for the application.

Smart Infrastructures

The Infrastructure dimension in the PEOPLE Scoreboard refers both to transport infrastructures and to ICT infrastructures, giving a complete overview of the effects of ICT services on these different types of infrastructures.

Indicator: ICT infrastructures

Rationale: The availability of ICT infrastructures, such as broadband access, DSL, FTTH and wi-fi is in many cases a condition for the use of innovative and inclusive ICT services across the Smart City. The availability of ICT infrastructures accelerates the development of a sustainable, competitive, innovative and inclusive information society. The indicator on ICT infrastructures will therefore give a direct image of Smartness of Cities.

Measurement:

- **Percentage of the city area covered by public wifi access.**

  Description

  This measurement will give a clear picture on the availability of ICT infrastructures across a city, facilitated by public authorities and private companies. It does not look at the amount of users that have access to internet through their private internet access, which is covered for in the dimension on smart citizens.

Means of Gathering

Desktop Research: There is no database containing this information

Survey Research: Data regarding the wi-fi spots and the level of coverage is available only through the technical service of the municipality and can be obtained by contact them.

Data Gathering Tools: Since there is not link to the internal data of the Municipality, there is no way to obtain this information in an automatic way

- **Percentage of area covered by UMTS.**

  Description

  This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.

  Means of Gathering

  Desktop Research: There is no database containing this information

  Survey Research: Such data could be obtained only through the National Regulatory Authority of Telecommunications after a request.

  Data Gathering Tools: Since there is not link to the internal data of the Municipality, there is no way to obtain this information in an automatic way

- **Percentage of area covered by LTE.**

  Description

  This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.

  Means of Gathering

  Desktop Research: There is no database containing this information

  Survey Research: Such data could be obtained after a survey at the techical service of the municipality

  Data Gathering Tools: Since there is not link to the internal data of the Municipality, there is no way to obtain this information in an automatic way.

Indicator: Smart Transport

Rationale: Traffic congestions and the sustainability agenda has brought renewed focus on public transport (buses, trains, metro, etc.) utilization in cities. Access to high quality information is of increasing importance as the transport becomes ever more dense, giving more control to the users and enable them to make decisions

about the commute, helping them to manage their time and experience. ICT technologies facilitate payments, give mobile and station based information on transport and durations and improve the quality of transport.

Measurement:

- **Amount of innovative ICT services that facilitate transport in the city.**

Description

The amount of ICT services resulting from the project that facilitate transport can consist of real time information facilities, automatic payments, intelligent bus stops, etc. and demonstrate the impact on the smart infrastructure of the city.

Means of Gathering

Desktop Research: There is no such statistical database. The pilot created an application regarding parking finding, and this is the only service regarding parking in the city of Thermi. Another application that exists regarding local buses routes is available for the whole area of Thessaloniki (including Thermi).

Indicator: Smart Public Infrastructures:

Rationale: The use of innovative ICT services by public infrastructures provides for an increased amount of data. It gives the opportunity to deploy new innovative ICT services based on these smart infrastructures in smart buildings. This indicator also reflects the use of smart technologies in the smart city and the embeddedness in the society.

Measurement:

- **Percentage of public buildings that support indoor navigation**.

Description

The amount of public buildings that support indoor navigation will demonstrate the use of innovative technologies in infrastructures, offering possibilities for the deployment of innovative ICT services for indoor navigation.

Means of Gathering

Desktop Research: There is no database containing this information. No such infrastructures exist in the area,

- **Percentage of public infrastructures (public buildings, buses, parkings, transport systems, etc) equipped with NFC systems.**

Description

The amount of infrastructures that are equipped with NFC systems will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research: There is no database containing this information. No such infrastructures exist in the area,

- **Percentage of public infrastructures (public buildings, buses, parkings, etc.) equipped with smart cameras.**

Description

The amount of infrastructures that are equipped with smart cameras will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research: There is no database containing this information. No such infrastructures exist in the area,

- **Percentage of public infrastructures (public buildings, buses, parkings, etc) equipped with sensors.**

Description

The amount of infrastructures that are equipped with sensors will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research: There is no database containing this information. Sensors are used in two of the pilot's applications but there is not an automatic way to retrieve the number of public infrastructures equiped with sensors compared to the overall number of infrastructures that exist in the area.

Survey Research: This information could be retrieved through a survey at the Technical Service of the Municipality of Thermi or after an in situ monitoring activity.

Data Gathering Tools: So far, there is no way to obtain this information in an automatic way.

Smart Governance

Smart Governance relates to the role of public authorities in order to push the innovation process in the Smart City further. It also relates to the level of transparent governance through innovative technologies and the accessibility of data. Smart Governance also refers to the use of technologies in order to facilitate high quality public and social services from authorities. This can have a wide range from the use of ICT technologies for better health services, education, transport, tourism, etc

Indicator: Transparent data

Rationale: The availability of different types of data makes it possible to base new innovative ICT services and the creation of a data model, one of the main objectives of the PEOPLE project. Public authorities have a large amount of data available that can be used effectively, such as measurements on the quality of air,

touristic information, public transport information, health information, etc. that can be exploited through new business perspectives.

Measurement:

- **Amount of data available from public authorities that can be used effectively for new services.**

Description

This measurement will give a clear view on public data that is available for free or for compensation in order to design new ICT services based on this information. These new services will actively stimulate smart governance, smart economy and the smart city in general.

Means of Gathering

Desktop Research: There are no such data yet.

- **Number of project services that use open data.**

Description

This indicator reflects the actual use of the open data in the project and for the deployment of the ICT services.

Means of Gathering

Desktop Research: So far, none of the services use open data but they produce open data

Survey Research: If project services will start using open data, then this information can be only acquired through a survey

Indicator: Innovative public policy

Rationale: Effective public policy to stimulate innovation in a city will have a large impact on the level of smartness in a city. Policy is essential for making the transaction to a knowledge based economy, as well as for improving production technologies and stimulating growth.

Measurement:

- **Amount of public R&D expenditures as percentage of overall expenditures of a city.**

Description

This measurement will define all R&D expenditures of the government sector in a city and the higher education sector. R&D expenditures is one of the main tools of public policy to drive innovation processes and provides therefore key indications on the level of public involvement to stimulate the smart city.

Means of Gathering

Desktop Research: This information is not collected in a systematic way, therefore there is no database containing this information.

Survey Research: The information could be obtained through the General Secretariat of Research and Technology (GSRT) which is the national authority for promoting research, through the Ministry of Development in national accounts or by collecting separately information from the Universities of the area and the research institutes which operate in Thermi

Data Gathering Tools: So far, there is no way to obtain this information in an automatic way.

Indicator: Smart public services

Rationale: The indicator relates to governments commitment to offer more effective and efficient public services, through innovative technologies. Governments can make administrative processes easier for citizens and businesses through online applications and transactions. This will at the same time improve data quality as more information is validated online directly. Smart cards can be used to safely identify users of public services and facilitate payments and control. This will have effects on all dimensions related to the Smart City, such as Smart Governance, Smart Economy, Smart Citizens and Smart Infrastructures.

Measurement:

- **Number of project´s ICT services that solve or complement public services:**

Description

Large part of ICT services solve problems related to public services, such as in education and transportation. Other services solve more general issues, like those for social integration or local resource management. The number of services directly improving education, health services, transport services, etc. is an indicator of the spreading of ICT services into the public domain.

Means of Gathering

Desktop Research: There is no database containing this information. So far, all services of the project solve or complement public services with different however degree of complementarity.

Survey Research: Such information can be only retrieved through a qualitative survey at the Municipality of Thermi/ or/and through a survey sent to the citizens of Thermi.

Indicator: Public governance implication

Rationale: The implication of public authorities in progress of Smart Cities is of crucial importance. Public authorities and decision makers can facilitate the deployment of ICT services, set regulations for their use and provide for a wider dissemination towards citizens. This indicator therefore demonstrates the level of integration of ICT services and smart governance in the smart city and shows the acceptance by its decision makers.

Measurement:

- **Number of public organizations and department involved**:

Description

This measurement will indicate the level participation and acceptance of public authorities through their direct involvement in the project.

Means of Gathering

Desktop Research: So far this information is only provided at the project's deliverables in a descriptive way, and more specifically in the D. 1.1 Activation of stakeholders.

Survey Research: The information could be obtained only through surveys

Data Gathering Tools: There is no way of obtaining this information in an automatic way. The involvement of a stakeholder may not be so obvious in the operation of a survey but may be significant at its design/or in other stages of app development.

- **Number of public organizations and departments that use the project´s ICT service**.

Description

By measuring the amount of organizations and departments that actually use the service, whether it is as a data provider, administrator or user gives a clear indication on the level of acceptance.

Means of Gathering

Desktop Research: There is no database containing this information. Information on this could be retrieved only regarding the back-end use of the ICT services.

Survey Research: Information regarding the front end can be accessed only through surveys

Data Gathering Tools: Information regarding the back-end use of the ICT services could be automatically retrieved through the administration accounts created.

Citizens in Smart Cities

The dimension of Smart Citizens relates to the use of innovative technologies by citizens. The use of innovative technologies must be first defined by the access that citizens have to these technologies. Then the level of involvement in the innovation process must be measured in order to define the citizens contribution in the push towards further smartness in the pilots and Smart Cities. Also the level of implication in the governance process must be defined in order to have an indication on the involvement of citizens in a city in general. Finally based on the experiences of the citizens the improvement of quality of life will be measured by asking the citizens their level of satisfaction with the different PEOPLE dimensions.

Indicator: Citizen ICT access

This indicator will indicate the level of ICT availability for citizens in the smart city in order to use the ICT services. The availability of ICT is made possible through PCs and mobile phone and requires an internet connection through broadband or through the mobile phone. This is considered as a prerequisite in order to define the impact on the smart city.

Measurement:

- **Percentage of citizens that have an internet subscription.**

Means of Gathering

Desktop Research: There is no database containing this information

Survey Research: This information can be retrieved through the telecommunication companies or the National Statistical Authority (available only for census years).

Indicator: Citizens and ICT services

Rationale: High citizens' participation levels give an indication on the level of engagement of citizens in the Smart City concept. ICT services can facilitate the citizen participation through offering platforms for opinion sharing and to hear new proposals. Interactions with citizens are opportunities to share information and improve lives. The user driven methodology will imply a higher involvement of citizens to enable design and ICT services to be more citizens-centric and aligned with their real needs. Citizens need to be both more demanding and more willing to get involved in the design process.

Measurement:

- **Amount of citizens that participate in the project,**

Description

by giving requirements, feedback or any type of suggestion regarding ICT services. This measurement will analyze the level of implication of citizens in driving the Smart City and determine the level of implication of the user driven methodology in the project.

Means of Gathering

Desktop Research: There is no database containing this information. However it could be created by collecting the log files of the users entering the application

Survey Research: Qualitative data on the profiles of citizens that use the applications (age, sex, level of education etc.) can be obtained through online surveys, as there is no request for personal information (apart from name and e-mail) in order to create a user account for the applications.

Data Gathering Tools: Data can be collected automatically through the log files of the users.

- **Amount of citizens using the project ICT services.**

Description

This measurement indicates the role of the citizens in the innovation lifecycle by analyzing whether citizens are using the ICT services that are the result of the project for their daily activities.

  - Amount of citizens using the projects ICT services for the Smart Economy (virtual marketplace, smart scheduler).
  - Amount of citizens using ICT services for Smart Infrastructures. (Intelligent bus stops, parking service, indoor navigation, access control NFC, Hoyrespiro)

- Amount of citizens using ICT services for Smart Governance (Citizen´s portal, 3D tourism, courses.

Means of Gathering

Desktop Research: There is no database containing this information.

Data Gathering Tools: Data can be collected automatically through the log files of the users

Indicator: Citizens level of satisfaction

Rationale: The final objective of the Smart City can be defined as the improvement of life of citizens. A smart City makes a conscious effort to use innovative ICT based solutions to improve conditions of living and working and to support a more inclusive and sustainable urban environment.ICT can be used as a tool to ameliorate daily life, through better public services, a healthier economy and more convenient transport. Quality of life is defined here through the level of satisfaction with the ICT services deployed

Measurement:

- **Citizens´ level of satisfaction with ICT services:**

Description

This measurement will be given through a survey after and will give an idea on the impact of the ICT services. Depending on the service the survey would consist of some questions related to the user friendliness, the innovativeness, the quality and whether the service would be recommended to colleagues and friends.

Means of Gathering

Desktop Research: So far such information exists only for a very limited number of users which have participated in online surveys and validation sessions. These data cannot form a database yet.

Survey Research: Such information can be collected through an online survey

- **Citizens´ perception on impact of innovative services on quality of life:**

Description

This measurement will show whether citizens perceive that the project´s ICT services have an impact on their quality of life, i.e. makes certain aspects, tasks or activities easier and facilitates an added value to their daily activities.

Means of Gathering

Desktop Research: There is no database containing this information.

Survey Research: Such information can be collected through an online survey

- **ICT success rate:**

Description

The amount of offers, search and uses that ended with a positive results, i.e. offers that had a demand and requests that were met. This will demonstrate the impact of the service and its effectiveness, making it possible to compare this with the citizens' level of satisfaction.

Means of Gathering

Desktop Research: No such statistical database exists. All services developed have been accepted and used by Thermi's citizens. However, at the development of the scenario for Thermi pilot, a number of other services have been proposed and were asked by Thermi citizens (e.g. bike sharing and digital calendar of events) which were not possible to implement within the framework of PEOPLE project.

6.5 Bremen

Smart Economy

The Smart Economy dimension in the PEOPLE Scoreboard uses smartness and innovative technologies to stimulate further progress in the economy related to entrepreneurship, businesses, innovation and labor flexibility. These following indicators of the Smart Economy will be measured:

Indicator: Businesses in Smart Cities

Rationale: Businesses in the EU are the key driver for economic growth, innovation, employment and social integration. The project has the objective to improve the competitiveness of businesses in the Smart Cities through the use of innovative ICT. Therefore this indicator will demonstrate the impact of the uptake of innovative technologies and services by businesses in order to increase productivity and revenue.

Measurement:

- **Number of companies involved in the project (pilot).**

  Description

  The amount of companies that are using the ICT services for their activities will demonstrate the acceptance of the concept among businesses. The amount of businesses that are involved in the pilot through different ways, giving feedback and requirements, will express the degree of influence of the companies on the service creation and improvement.

  Means of Gathering

  Desktop Research: Counting partners (no database). BIBA, TZI, data-quest GmbH, Uni-Bremen, Sparkasse Bremen, Facebook, Twitter, Apple, Google

- **Number of businesses adopting or using the projects ICT services as part of their activity.**

  Description

This measurement will give an indication on the acceptance of businesses of the Smart City concept and innovative ICT services.

Means of Gathering

Desktop Research: Data-quest GmbH (Stud.IP), Apple, Google

Indicator: Smart Services and Products

Rationale: The objective of the project is to end with a portfolio of ICT services that are really integrated, composed, adapted and deployed, based on the city's most important needs, challenges and priorities. These services use the data coming from the urban ecosystem into which they are implemented. The services are focused on overcoming/alleviating some of the critical challenges faced by cities nowadays that will make participant citizens perceive that they live better, demonstrating the advantages of the internet-based services deployed and of smart cities (and gearing cultural change towards their uptake)[16].

Measurement:

- **Number of developed and conceptualized commercial services that can be transferred/uptaken by businesses.**

  Description

  The number of conceptualized commercial services that are collected by the project and that have a business model can be scaled up by companies, demonstrating an impact on the Smart Economy of the Smart City.

  Means of Gathering

  Desktop Research: All project services. Module-Guide, Mobile Stud.IP, iOS App, eStudent LBS, NFC Access Control; Weitere Services die evt. folgen: Group Builder, Digital Blackboard, Indoor Navigation

Indicator: Innovative entrepreneurship

Rationale: The objective of the PEOPLE pilots is to stimulate entrepreneurship and to improve capacities for entrepreneurs to develop, validate and integrate new ideas and rapidly scale-up for their services and products. This indicator will demonstrate the impact on the development of new ideas, services and products in the Smart Economy.

Measurement:

- **The number of licenses defined**.

  Description

[16] DoWv4, page 7.

In order to measure the level of entrepreneurship of the results of the project and the capacities to develop new products and services based on these results that will determine the competitive advantage and the progress in the Smart Economy, the number of protective measures that have been defined in the Smart Cities as a result from the project.

Means of Gathering

Desktop Research: Each application one license: Module-Guide, Mobile Stud.IP, iOS App, eStudent LBS

- **Number of companies that express interest in open data availability.**

  Description

  The number of companies that express interest in open data availability through the project demonstrates the potential for further innovative entrepreneurship. It reflects the level of exploitability of the results of the project and its interest towards businesses. This will constitute an impact on the smart economy and the smart city in general.

  Means of Gathering

  Desktop Research: Counting (no database) - data-quest GmbH (Stud.IP). This information can be obtained automatically from Sparkasse Bremen: http://www.unifiliale.de/mit-der-smartphone-app-gut-informiert-uber-den-campus-schlendern/

- **Number of innovative technological business registrations based on the project results.**

  Description

  In order to define the level of innovative entrepreneurship, the new business registrations over a certain period will be analyzed that can be linked directly to the results of the project. A higher share of innovative new companies reflects a higher level of innovative activities and a smarter economy.

  Means of Gathering

  Data Gathering Tools: Registered businesses in Bremen sorted by business sector; statistics office Bremen; only till January 2012; http://www.statistik.bremen.de/sixcms/detail.php?gsid=bremen02.c.730.de

- **Number of entrepreneurs using the project´s ICT services**:

  Description

  This indicator looks at the activity of individuals in the Smart Economy, using ICT services to offer their professional services and to look for commercial collaboration.

  Means of Gathering

Data Gathering Tools: Technologiepark Bremen: http://www.technologiepark-bremen.de/de/techpark-news-detail?sv%5Bid%5D=266547; Sparkasse Bremen: http://www.unifiliale.de/mit-der-smartphone-app-gut-informiert-uber-den-campus-schlendern/

Smart Infrastructures

The Infrastructure dimension in the PEOPLE Scoreboard refers both to transport infrastructures and to ICT infrastructures, giving a complete overview of the effects of ICT services on these different types of infrastructures.

Indicator: ICT infrastructures

Rationale: The availability of ICT infrastructures, such as broadband access, DSL, FTTH and wi-fi is in many cases a condition for the use of innovative and inclusive ICT services across the Smart City. The availability of ICT infrastructures accelerates the development of a sustainable, competitive, innovative and inclusive information society. The indicator on ICT infrastructures will therefore give a direct image of Smartness of Cities.

Measurement:

- **Percentage of the city area covered by public wifi access.**

  Description

  This measurement will give a clear picture on the availability of ICT infrastructures across a city, facilitated by public authorities and private companies. It does not look at the amount of users that have access to internet through their private internet access, which is covered for in the dimension on smart citizens.

  Means of Gathering

  Desktop Research: Search number of free hotspots and make relation to area of bremen. http://www.freie-hotspots.de/result.php?country=%25&id=spotdata_sda.town_sda&content=Bremen; http://www.hotspot-locations.de/modules.php?name=HotSpots&op=hotspot_query&hsl_countryhs=DE&hs_state=Bremen&hs_city=&hs_operator=&hsl_type=&hs_access_box=on&search=Suchen

- **Percentage of area covered by UMTS.**

  Description

  This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.

  Means of Gathering

  Data Gathering Tools: coverage per provider adding up and in relation to area of bremen. Not very precise but data is difficult to get anyways for this; http://www.elektronik-kompendium.de/sites/kom/1307081.htm

- **Percentage of area covered by LTE.**

  Description

  This measurement will give a clear picture on innovativeness of the availability of ICT infrastructures across a city, facilitated by public authorities and private companies.

  Means of Gathering

  Data Gathering Tools: Coverage per provider adding up and in relation to area of bremen. Not very precise but data is difficult to get anyways for this; http://www.elektronik-kompendium.de/sites/kom/1307081.htm

Indicator: Smart Transport

Rationale: Traffic congestions and the sustainability agenda has brought renewed focus on public transport (buses, trains, metro, etc.) utilization in cities. Access to high quality information is of increasing importance as the transport becomes ever more dense, giving more control to the users and enable them to make decisions about the commute, helping them to manage their time and experience. ICT technologies facilitate payments, give mobile and station based information on transport and durations and improve the quality of transport.

Measurement:

- **Amount of innovative ICT services that facilitate transport in the city.**

Description

The amount of ICT services resulting from the project that facilitate transport can consist of real time information facilities, automatic payments, intelligent bus stops, etc. and demonstrate the impact on the smart infrastructure of the city.

Means of Gathering

Desktop Research: Counting/Service descriptions with tag/keywords "transport". eStudent LBS -> public transport

Indicator: Smart Public Infrastructures:

Rationale: The use of innovative ICT services by public infrastructures provides for an increased amount of data. It gives the opportunity to deploy new innovative ICT services based on these smart infrastructures in smart buildings. This indicator also reflects the use of smart technologies in the smart city and the embeddedness in the society.

Measurement:

- **Percentage of public buildings that support indoor navigation**.

Description

The amount of public buildings that support indoor navigation will demonstrate the use of innovative technologies in infrastructures, offering possibilities for the deployment of innovative ICT services for indoor navigation.

Means of Gathering

Data Gathering Tools: Indoor plans by Google by country. Germany is currently not supported. http://support.google.com/gmm/bin/answer.py?hl=en&topic=1685871&answer=1685827

- **Percentage of public infrastructures (public buildings, buses, parkings, transport systems, etc) equipped with NFC systems.**

Description

The amount of infrastructures that are equipped with NFC systems will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Desktop Research: Not really searchable. Estimation can be made for buildings; e.g. university and education facilities, airport; Statistics office Bremen http://www.statistik.bremen.de/sixcms/detail.php?gsid=bremen02.c.730.de

- **Percentage of public infrastructures (public buildings, buses, parkings, etc.) equipped with smart cameras.**

Description

The amount of infrastructures that are equipped with smart cameras will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Data Gathering Tools: Public cameras in Bremen; Statistics Office of Bremen; http://www.standorte-videoueberwachung.bremen.de/sixcms/detail.php?gsid=bremen02.c.734.de

- **Percentage of public infrastructures (public buildings, buses, parkings, etc) equipped with sensors.**

Description

The amount of infrastructures that are equipped with sensors will accelerate the deployment and uptake of new innovative ICT services.

Means of Gathering

Data Gathering Tools: Brepark has parking space equipped with sensors. BSAG provides data about buses (positioning, schedules) http://www.brepark.de; http://www.bsag.de

Smart Governance

Smart Governance relates to the role of public authorities in order to push the innovation process in the Smart City further. It also relates to the level of transparent governance through innovative technologies and the accessibility of data. Smart Governance also refers to the use of technologies in order to facilitate high quality public and social services from authorities. This can have a wide range from the use of ICT technologies for better health services, education, transport, tourism, etc

Indicator: Transparent data

Rationale: The availability of different types of data makes it possible to base new innovative ICT services and the creation of a data model, one of the main objectives of the PEOPLE project. Public authorities have a large amount of data available that can be used effectively, such as measurements on the quality of air, touristic information, public transport information, health information, etc. that can be exploited through new business perspectives.

Measurement:

- **Amount of data available from public authorities that can be used effectively for new services.**

Description

This measurement will give a clear view on public data that is available for free or for compensation in order to design new ICT services based on this information. These new services will actively stimulate smart governance, smart economy and the smart city in general.

Means of Gathering

Desktop Research: NFC Access Control: Floor plans of public buildings; Stud.IP Mobile Version: Education Management at the University of Bremen and potential other universities using Stud.IP; http://studip.de;

- **Number of project services that use open data.**

Description

This indicator reflects the actual use of the open data in the project and for the deployment of the ICT services.

Means of Gathering

Desktop Research: Alle Apps: NFC Access Control (floor plans); Stud.IP Mobile Version (course plans); LBS App (maps, bus schedules, etc.); iOS App; Module Guide (study regulation at Uni Bremen)

Indicator: Innovative public policy

Rationale: Effective public policy to stimulate innovation in a city will have a large impact on the level of smartness in a city. Policy is essential for making the transaction to a knowledge based economy, as well as for improving production technologies and stimulating growth.

Measurement:

- **Amount of public R&D expenditures as percentage of overall expenditures of a city.**

Description

This measurement will define all R&D expenditures of the government sector in a city and the higher education sector. R&D expenditures is one of the main tools of public policy to drive innovation processes and provides therefore key indications on the level of public involvement to stimulate the smart city.

Means of Gathering

Data Gathering Tools: Public Data by "Senatorin Für Finanzen"; http://www.finanzen.bremen.de/sixcms/detail.php?gsid=bremen53.c.1692.de

Indicator: Smart public services

Rationale: The indicator relates to governments commitment to offer more effective and efficient public services, through innovative technologies. Governments can make administrative processes easier for citizens and businesses through online applications and transactions. This will at the same time improve data quality as more information is validated online directly. Smart cards can be used to safely identify users of public services and facilitate payments and control. This will have effects on all dimensions related to the Smart City, such as Smart Governance, Smart Economy, Smart Citizens and Smart Infrastructures.

Measurement:

- **Number of project´s ICT services that solve or complement public services:**

Description

Large part of ICT services solve problems related to public services, such as in education and transportation. Other services solve more general issues, like those for social integration or local resource management. The number of services directly improving education, health services, transport services, etc. is an indicator of the spreading of ICT services into the public domain.

Means of Gathering

Desktop Research: Apps for the University to support the education service as such: Module Guide, Stud.IP Mobile Version, LBS App, iOS App

Indicator: Public governance implication

Rationale: The implication of public authorities in progress of Smart Cities is of crucial importance. Public authorities and decision makers can facilitate the deployment of ICT services, set regulations for their use and provide for a wider dissemination towards citizens. This indicator therefore demonstrates the level of

integration of ICT services and smart governance in the smart city and shows the acceptance by its decision makers.

Measurement:

- **Number of public organizations and department involved**:

Description

This measurement will indicate the level participation and acceptance of public authorities through their direct involvement in the project.

Means of Gathering

Desktop Research: Counting partners (stakeholder list). BIBA, TZI, Studentenwerk Bremen, ZMML, SUUB (library)

- **Number of public organizations and departments that use the project´s ICT service**.

Description

By measuring the amount of organizations and departments that actually use the service, whether it is as a data provider, administrator or user gives a clear indication on the level of acceptance.

Means of Gathering

Desktop Research: Uni-Bremen consisting of many organizations. Count number of institutes at universities with mobile Stud.IP users. Sometimes there is an index of institutes http://www.uni-bremen.de/de/universitaet/die-uni-im-ueberblick/organisationsstruktur/a-z-liste-aller-institutionen.html

Citizens in Smart Cities

The dimension of Smart Citizens relates to the use of innovative technologies by citizens. The use of innovative technologies must be first defined by the access that citizens have to these technologies. Then the level of involvement in the innovation process must be measured in order to define the citizens contribution in the push towards further smartness in the pilots and Smart Cities. Also the level of implication in the governance process must be defined in order to have an indication on the involvement of citizens in a city in general. Finally based on the experiences of the citizens the improvement of quality of life will be measured by asking the citizens their level of satisfaction with the different PEOPLE dimensions.

Indicator: Citizen ICT access

This indicator will indicate the level of ICT availability for citizens in the smart city in order to use the ICT services. The availability of ICT is made possible through PCs and mobile phone and requires an internet connection through broadband or through the mobile phone. This is considered as a prerequisite in order to define the impact on the smart city.

Measurement:

- **Percentage of citizens that have an internet subscription.**

Means of Gathering

Desktop Research: Availability of broad band internet to households in Bremen: http://de.statista.com/statistik/daten/studie/28554/umfrage/verfuegbarkeit-von-breitbandinternet-in-bremen/; Households with Internet: http://www.initiatived21.de/themen

Indicator: Citizens and ICT services

Rationale: High citizens' participation levels give an indication on the level of engagement of citizens in the Smart City concept. ICT services can facilitate the citizen participation through offering platforms for opinion sharing and to hear new proposals. Interactions with citizens are opportunities to share information and improve lives. The user driven methodology will imply a higher involvement of citizens to enable design and ICT services to be more citizens-centric and aligned with their real needs. Citizens need to be both more demanding and more willing to get involved in the design process.

Measurement:

- **Amount of citizens that participate in the project,**

Description

by giving requirements, feedback or any type of suggestion regarding ICT services. This measurement will analyze the level of implication of citizens in driving the Smart City and determine the level of implication of the user driven methodology in the project.

Means of Gathering

Desktop Research: Estimation from different sources: Workshops, Surveys, Fans on Facebook

- **Amount of citizens using the project ICT services.**

Description

This measurement indicates the role of the citizens in the innovation lifecycle by analyzing whether citizens are using the ICT services that are the result of the project for their daily activities.

- Amount of citizens using the projects ICT services for the Smart Economy (virtual marketplace, smart scheduler).
- Amount of citizens using ICT services for Smart Infrastructures. (Intelligent bus stops, parking service, indoor navigation, access control NFC, Hoyrespiro)
- Amount of citizens using ICT services for Smart Governance (Citizen´s portal, 3D tourism, courses.

Means of Gathering

Desktop Research: Estimation from different sources: Workshops, Surveys, Fans on Facebook.

Indicator: Citizens level of satisfaction

Rationale: The final objective of the Smart City can be defined as the improvement of life of citizens. A smart City makes a conscious effort to use innovative ICT based solutions to improve conditions of living and working and to support a more inclusive and sustainable urban environment.ICT can be used as a tool to ameliorate daily life, through better public services, a healthier economy and more convenient transport. Quality of life is defined here through the level of satisfaction with the ICT services deployed

Measurement:

- **Citizens´ level of satisfaction with ICT services:**

Description

This measurement will be given through a survey after and will give an idea on the impact of the ICT services. Depending on the service the survey would consist of some questions related to the user friendliness, the innovativeness, the quality and whether the service would be recommended to colleagues and friends.

Means of Gathering

Survey Research: Survey results and qualitative analysis of given feedback (formal and informal)

- **Citizens´ perception on impact of innovative services on quality of life:**

Description

This measurement will show whether citizens perceive that the project´s ICT services have an impact on their quality of life, i.e. makes certain aspects, tasks or activities easier and facilitates an added value to their daily activities.

Means of Gathering

Survey Research: Survey results and qualitative analysis of given feedback (formal and informal)

- **ICT success rate:**

Description

The amount of offers, search and uses that ended with a positive results, i.e. offers that had a demand and requests that were met. This will demonstrate the impact of the service and its effectiveness, making it possible to compare this with the citizens' level of satisfaction.

Means of Gathering

Desktop Research: Could be extracted from above surveys and feedback

7. Data processing strategy

In deliverable 3.1.4 the actual values for the different indicators will be collected. This information will be standardized in order to allow the comparison between Pilots at the end of the project and to make possible the comparison of the performance of the cities along time (beyond the end of the project.)

As we have mentioned previously, the information will be standardized using the z-transformation method or z-score.

$$z = \frac{X - \mu}{\sigma}$$

X stands for the indicator value obtained

μ stands for the mean of the values obtained for that indicator (along the different pilots o along different moments in the city, depending on the type of comparison required)

σ stands for standard deviation that is calculated as the square root of the variance. The standard deviation shows how far from the mean a value is still considered “normal”.

In D3.1.4, after the collection of the values for all the indicators the following calculations will be performed for the 4-values sets obtained per indicator:

- Calculation of the mean (average of the four values)
- Calculation of the Variance
- Calculation of the Standard deviation
- Calculation of the z-score.

By doing this we will obtain standardized values with an average 0 and a standard deviation 1, meaning that every value below -1 and above 1 can be considered “non standard”. This procedure allows an easy comparison between values and facilitates the creation of an overall score where weights can be implemented prioritizing Smart Cities dimensions according to the Pilots interests.

We will consider the possibility of implementing an automatic method for obtaining z-scores integrated in the wiki, in particular in the Scoreboard section. This way, any change on the indicators values will be reflected in a new z-score allowing the automatic re-arrangement of any implemented index.

8. Privacy Issues

Following we present a summary of the privacy issues that have arisen in the Pilots and the strategy that has been followed in order to deal with them.

8.1 Bilbao

"Hoyrespiro" service:

This service uses sources of open data from public entities. There are not personal data included in the implementation. Consultation of information is always anonymous and no private data of any kind are used.

"3DWalkingTour" service:

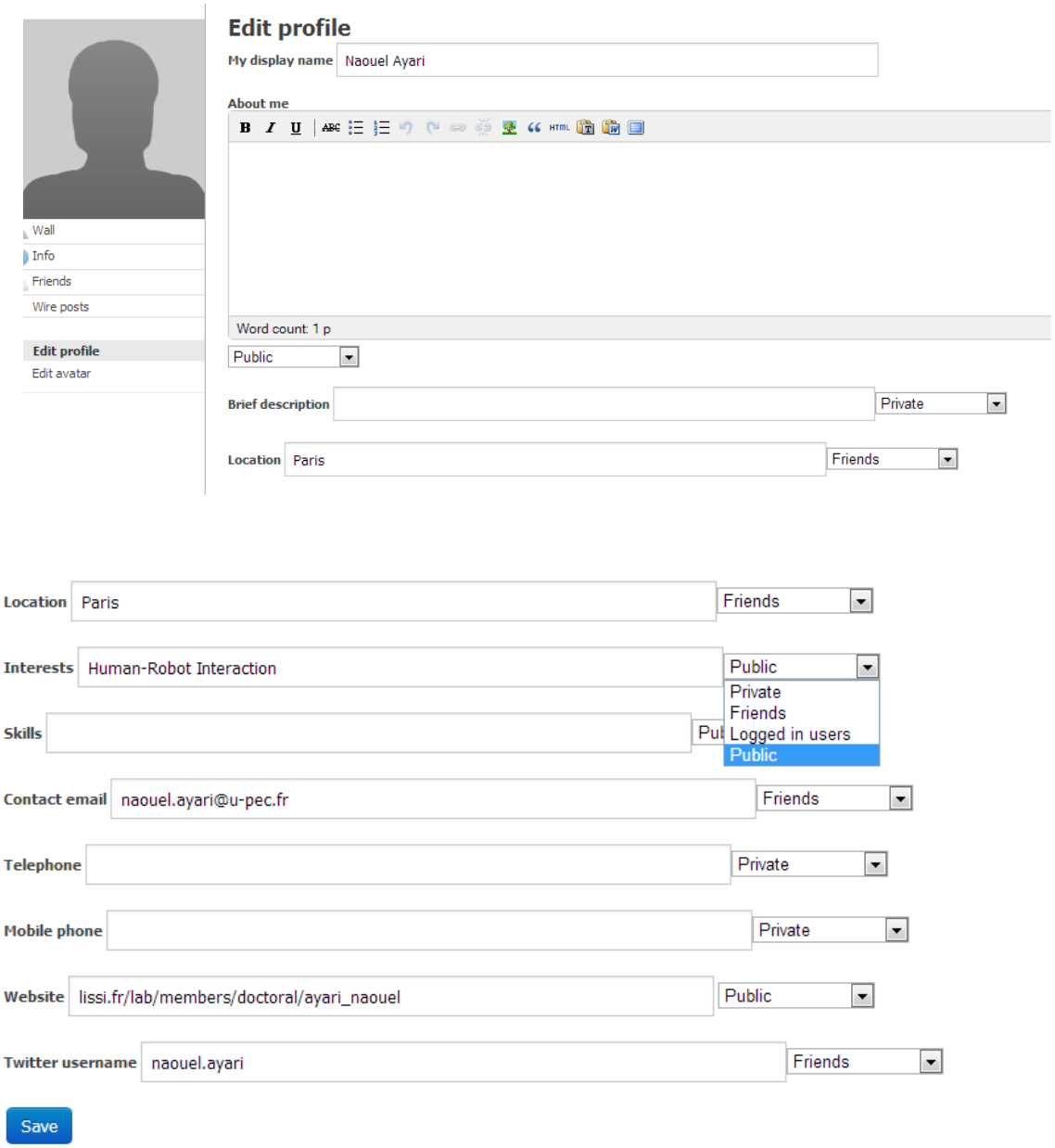
This service uses external images of buildings within the city. Images have been selected avoiding to include recognizable faces. There are not personal data included in the implementation. Consultation of information is always anonymous and no private data of any kind are used.

"Geocur" service:

This service uses and provides public information on the learning, training and cultural offer of Bilbao City Council. There are not personal data included in the implementation. Consultation of information is always anonymous and no private data of any kind are used.

8.2 Vitry Sur Seine

One key feature that distinguishes Vitry pilote services from similar tools is that the privacy management concept is done according user-centered approach. The privacy management is based on the Elgg middleware. The key feature of Elgg is that it provides reasonable support for privacy control at a fairly granular level that other tools simply don't have. The user can define her/his privacy preferences by selecting the authorized disclosure group. By default the middleware allow only four groups: Public means any person registered in the people services platform, Friends of the user, any person registered and currently logged in the system and private share.



The artifacts stored in the elgg data base have a wide variety, ranging from personal profile, location to private or between friends discussions. From interviews that have conducted with lead users, who have experience with facebook, twitter, forums, and weblogs, during the monitoring sessions. The first issue that is rised by the users concerns the self control of private data against the collection of long-term service use data and their exploitation by third party without agreement from users.

To handle this issue the recovery solution is the integration of extension layer ontop of elgg called Clique (http://clique.primelife.eu). This latter is a modification of the Elgg standard platform that provides users with capabilities to keep control over their privacy. This includes, for example, fine grained access control and configuration of multiple faces (e.g. family, personal, professional) that can be used for interactions with other users. When posting a data item, e.g., name, birthday or profile photo on the site, the user can define for every single other user whether they should be able to see it or not.
The second issue that is of crucial importance is how to give user control during realtime access to their private data. Users expect to trust the system category may be targeted to a different group of audiences that are not necessarily static. Thus the users expect that privacy control system can be dynamic in order to take the context of the use. The third issue expressed by users concerns people's attitude when they want to disclose certain artefacts. The user fear is that artifacts might be interpreted out of context.

For the best of our knowledge there is no reliable system that can be used to deal with this issues in the very short term. The users should define their privacy rules by defining the common criteria of group based sharing. Users should be trained to do that and must read the service use guide.

8.3 Thermi

The services developed create datasets with personal information in two separate cases:

a) businesses that participate in the Virtual Marketplace application (smart economy) either by entering information on their profession/enterprise or by submitting a deal valid for a specific time period.

b) people that use the applications (citizens in smart cities) by creating an account i.e. for rating businesses and their services (Virtual Marketplace), submitting an issue or commenting on one (Improve my City), downloading environmental data (Sense the City) or adding a place of interest in Thermi area (Virtual Tour). In this case, users have to provide a username and an e-mail account, which remain private, and in some case a phone number.

The operation of the services also develops secondary information regarding governance (smart governance), yet this should be combined with one of the previous two datasets in order to create privacy issues.

Privacy issues regarding user registration in Virtual Marketplace, Improve my City, Virtual City Tour and Sense the City are addressed in the following way:

- Registration and Login process take place under HTTPS (secure http) which provides authentication of the web site and associated web server that one is communicating with, which protects against Man-in-the-middle attacks. Additionally, it provides bidirectional encryption of communications between a client and server, which protects against eavesdropping and tampering with and/or forging the contents of the communication.
- Users credentials are stored on database not as plain text, but using MD5 encryption. MD5 is a widely used cryptographic hash function that produces a 128-bit (16-byte) hash value.

- Concerning interaction of the services with 3rd party tools (like mobile applications) on top of the other (1,2) a unique private 16bit key is used to authenticate securely the transactions.

8.4 Bremen

For Bremen, the biggest concern about privacy was the abuse of personal data of students and lecturers related to the Stud.IP service. The means for mobile access had to be carefully discussed with the ZMML and realized thoroughly (which takes a long time and several iterations).
Within our Stud.IP client we do not store any private data. There is one exception: the storage of the username and password. As it is somehow hard to enter a username followed with “@uni-bremen.de” every time we decided to offer a checkbox “store username and PW”, which enters this data in the dialog for the next access. This data are stored in the protected memory area of the App. It is not mirrored to no server and cannot be read out by any other app. Of course, there is no final guaranty that there is no way to spy out this data. But this ways are complicated and in relation to the value of the data beneath notice.

9. Final Scoreboard values and z-scores

8.1 Final scoreboard values

Nº	Smart Economy	Relating to which project objective	Method of measurement	Bilbao	Vitry	Thermi	Bremen
1	Businesses in Smart Cities	Businesses in the EU are the key driver for economic growth, innovation, employment and social integration. The project has the objective to improve the competitiveness of businesses in the Smart Cities through the use of innovative ICT. Therefore this indicator will demonstrate the impact of the uptake of innovative technologies and services by businesses in order to increase productivity and revenue.	Number of companies involved in the project (pilot).	6	5	420	3
			Number of businesses adopting or using the projects ICT services as part of their activity.	6	1	75	1
2	Smart Services and Products	The objective of the project is to end with a portfolio of ICT services that are really integrated, composed, adapted and deployed, based on the city's most important needs, challenges and priorities. These services use the data coming from the urban ecosystem into which they are implemented. The services are focused on overcoming/alleviating some of the critical challenges faced by cities nowadays that will make participant citizens perceive that they live better, demonstrating the advantages of the internet-based services deployed and of smart cities (and gearing cultural change towards their uptake	Number of developed and conceptualized commercial services that can be transferred/uptaken by businesses.	3	3	6	2
3	Innovative entrepreneurship	The objective of the PEOPLE pilots is to stimulate entrepreneurship and to improve capacities for entrepreneurs to develop, validate and integrate new ideas and rapidly scale-up for their services and products. This indicator will demonstrate the impact on the development of new ideas, services and products in the Smart Economy.	The number of licenses defined.	3	3	6	2
			Number of companies that express interest in open data availability.	6	6	0	0
			Number of innovative technological business registrations based on the project results.	N/A	0	N/A	0
			Number of entrepreneurs using the	5	1	N/A	0

			project´s ICT services.				
№	Smart Infrastructures	Relating to which project objective	Method of measurement	Bilbao	Vitry	Thermi	Bremen
4	ICT infrastructures	The availability of ICT infrastructures, such as broadband access, DSL, FTTH and wi-fi is in many cases a condition for the use of innovative and inclusive ICT services across the Smart City. The availability of ICT infrastructures accelerates the development of a sustainable, competitive, innovative and inclusive information society. The indicator on ICT infrastructures will therefore give a direct image of Smartness of Cities	Percentage of the city area covered by public wifi access.	5	30	N/A	20
			Percentage of area covered by UMTS.	100	80	N/A	N/A
			Percentage of area covered by LTE.	0	N/A	N/A	N/A
5	Smart Transport	Traffic congestions and the sustainability agenda has brought renewed focus on public transport (buses, trains, metro, etc.) utilization in cities. Access to high quality information is of increasing importance as the transport becomes ever more dense, giving more control to the users and enable them to make decisions about the commute, helping them to manage their time and experience. ICT technologies facilitate payments, give mobile and station based information on transport and durations and improve the quality of transport.	Amount of innovative ICT services that facilitate transport in the city.	3	2	2	2
6	Smart Public Infrastructures	The use of innovative ICT services by public infrastructures provides for an increased amount of data. It gives the opportunity to deploy new innovative ICT services based on these smart infrastructures in smart buildings. This indicator	Percentage of public buildings that support indoor navigation.	N/A	N/A	0	N/A
			Percentage of public infrastructures (public buildings, buses, parkings, transport systems, etc) equipped with	N/A	90	0	N/A

		also reflects the use of smart technologies in the smart city and the embeddedness in the society.	NFC systems.			
			Percentage of public infrastructures (public buildings, buses, parkings, etc.) equipped with smart cameras.	10	90	0	15
			Percentage of public infrastructures (public buildings, buses, parkings, etc) equipped with sensors.	1	90	N/A	10
№	Smart Governance	Relating to which project objective	Method of measurement	Bilbao	Vitry	Thermi	Bremen
7	Transparent data	The availability of different types of data makes it possible to base new innovative ICT services and the creation of a data model, one of the main objectives of the PEOPLE project. Public authorities have a large amount of data available that can be used effectively, such as measurements on the quality of air, touristic information, public transport information, health information, etc. that can be exploited through new business perspectives.	Amount of data available from public authorities that can be used effectively for new services	4	Little	2	Medium
			Number of project services that use open data.	1	2	N/A	1
8	Innovative public policy	Effective public policy to stimulate innovation in a city will have a large impact on the level of smartness in a city. Policy is essential for making the transaction to a knowledge based economy, as well as for improving production technologies and stimulating growth.	Amount of public R&D expenditures as percentage of overall expenditures of a city	1	4	N/A	3,8
9	Smart public services	The indicator relates to governments commitment to offer more effective and efficient public services, through innovative technologies. Governments can	Number of project´s ICT services that solve or complement public services:	3	2	5	1

		make administrative processes easier for citizens and businesses through online applications and transactions. This will at the same time improve data quality as more information is validated online directly. Smart cards can be used to safely identify users of public services and facilitate payments and control. This will have effects on all dimensions related to the Smart City, such as Smart Governance, Smart Economy, Smart Citizens and Smart Infrastructures.					
10	Public governance implication	The implication of public authorities in progress of Smart Cities is of crucial importance. Public authorities and decision makers can facilitate the deployment of ICT services, set regulations for their use and provide for a wider dissemination towards citizens. This indicator therefore demonstrates the level of integration of ICT services and smart governance in the smart city and shows the acceptance by its decision makers.	Number of public organizations and department involved	6	4	8	2
			Number of public organizations and departments that use the project´s ICT service	6	2	7	2
№	Citizens in Smart Cities	Relating to which project objective	Method of measurement	Bilbao	Vitry	Thermi	Bremen
11	Citizen ICT access	This indicator will indicate the level of ICT availability for citizens in the smart city in order to use the ICT services. The availability of ICT is made possible through PCs and mobile phone and requires an internet connection through broadband or through the mobile phone. This is considered as a prerequisite in order to define the impact on the	Percentage of citizens that have an internet subscription.	62,9	30	N/A	77

		smart city.					
12	Citizens and ICT services	High citizens' participation levels give an indication on the level of engagement of citizens in the Smart City concept. ICT services can facilitate the citizen participation through offering platforms for opinion sharing and to hear new proposals. Interactions with citizens are opportunities to share information and improve lives. The user driven methodology will imply a higher involvement of citizens to enable design and ICT services to be more citizens-centric and aligned with their real needs. Citizens need to be both more demanding and more willing to get involved in the design process.	Amount of citizens that participate in the project	2400	90	1.500	50
			Amount of citizens using the project ICT services.	1854	450	4.500	2000
			Amount of citizens that used the ICT services more than once	1088	200	1956	1500
			Average amount of time that citizens are using the ICT services	606	450	398	NA
13	Citizens level of satisfaction	The final objective of the Smart City can be defined as the improvement of life of citizens. A smart City makes a conscious effort to use innovative ICT based solutions to improve conditions of living and working and to support a more inclusive and sustainable urban environment.ICT can be used as a tool to ameliorate daily life, through better public services, a healthier economy and more convenient transport. Quality of life is defined here through the level of satisfaction with the ICT services deployed	Citizens´ level of satisfaction with ICT services	70	96	80	80
			Citizens´ perception on impact of innovative services on quality of life	67%	Improve Mobility and save time	Positive impact	N/A
			ICT success rate	50	80	N/A	N/A

Thermi Pilot's description of the indicator's values

Smart economy

Businesses in Smart Cities: Regarding data on smart economy, the value of the first indicator (number of companies involved in the project) comes from the catalogue of the professionals of Thermi. This catalogue is developed by the Association of Professional Traders of Thermi Municipality, according to the subscriptions made. The number provided here, consists of the registered professionals/enterprises which were given an id code for creating an account for the application.

The second indicator (number of businesses adopting or using the projects ICT services as part of their activity) refers to the enterprises who have completed their registration to Virtual Marketplace application, and can be automatically retrieved by the number of accounts which have been created through the application. Given that the training of professionals was conducted until the end of January, this indicator value is still low.

Smart services and products: Regarding smart services and products, the number of developed and conceptualised commercial services that can be transferred/uptaken by businesses comes from the number of applications which belong to the smart city services of Thermi, in addition to the mobile version of 'Improve my city' application. The location of the services in the same platform has the purpose of establishing an integrated set of ICT services based on the needs of the area.

Innovative entrepreneurship: So far, there is no automated way in collecting the number of licenses defined and the number of companies expressing interest in open data availability. However, especially in the case of the second indicator, a tool could be developed for submitting a request on the retrieval of the data created by 'sense the city' application (i.e. values of pollutants over a significant time period). This tool could count the number of requests expressed by companies.
Unfortunately, there is no information regarding the two other indicators of innovative entrepreneurship, nor is a way to obtain such info in an automatic way.

Smart infrastructure

ICT infrastructures: No data are available for the indicators regarding ICT infrastructures. For acquiring such information, even in a non-automatic way, the technical service of the Municipality of Thermi would need to re-organise itself drastically.

Smart transport: Given that applications regarding smart transport services are not provided by the same authority and can be found by various sources, it is difficult to find an automatic way for collecting this information. This deficiency is also strengthened by the fact that jurisdictions on transport are found in more than one organisation (responsible for the bus routes in Thessaloniki area is OASTH, for the bus routes in the wider area is KTEL, responsible for the public passenger transport and the transport system in general in Thessaloniki is SASTH etc). So far, apart from parking spaces availability, there is also another application regarding local buses routes available for the whole area of Thessaloniki (including Thermi).

Smart public infrastructures: Given that no such infrastructures exist in the area for most of the cases (NFC, smart cameras, indoor navigation) there is no such statistical database. The use of sensors for the two applications 'sense the city' and 'parking spaces availability' is the first implementation of smart public infrastructures in the area. This indicator can only be calculated for a specific type of public infrastructures; we can measure, for example, that 100% of fenced or organised public parking spaces are equipped with

sensors, but we cannot calculate the percentage of public buildings equipped with sensors, given that there is not an organised database registering public buildings.

Smart governance

Transparent data: All developed services produce open data. However, 'Improve my city' and 'Sense the city' applications provide data which can be used effectively for new services; the citizens issues for the improvement of quality of life and the data on atmospheric pollution in Thermi area.

Innovative public policy: Information on this indicator is not available and cannot be collected in an automated way. The information could be obtained through the General Secretariat of Research and Technology (GSRT) which is the national authority for promoting research, through the Ministry of Development in national accounts or by collecting separately information from the Universities of the area and the research institutes which operate in Thermi. Although potentially feasible, the collection of such information is extremely time consuming. In addition, there is a significant risk that the data collected from separate sources will be difficult to be normalised.

Smart public services: All of the ICT services developed in Thermi pilot solve or complement public services, with different however degree of effectiveness. The degree of effectiveness can be measured dually, both from the perspective of citizens (through surveys) and from the perspective of public administration using more measurable variables.

Public governance implication: Given the information collected in the Activation of stakeholders and users deliverable, the total number of public organisations and departments involved is 8; 6 municipal departments are involved in improve my city application, plus the officials from parking authority and the IT department that is responsible for the whole management of the services.

Regarding the number of public organisations and departments that use the project's ICT service, information can be retrieved based on the back end use of the services (so far, 6 departments and the parking clerks use the services). Unfortunately, for both indicators, there is no automatic way of retrieving this info; it can only be collected either by the administrators of the services, or through the conduction of surveys.

Citizens in smart cities

Citizen ICT access: This indicator can be easily retrieved from the statistical databases of the Hellenic Statistical Authority (EL.STAT.); although such data most usually refer to the census years. Unfortunately, given that the ELSTAT has not published yet the results from the 2011 census, information on this indicator is unavailable.

Citizens and ICT services: The amount of citizens that participate in the project (according to the respective indicator of the scoreboard is 1.500 – see D.1.7.4). In addition, based on the log files of the five developed services, the number of citizens that participate in the project is more than 4500 (3.603 unique visitors for improve my city application, 438 unique visitors for Virtual Maketplace, 275 unique visitors of Virtual Tour, 13 unique visitors of Sense the city and 116 unique visitors of Parking spaces availability application). Finally,

given the statistics retrieved from google analytics, the amount of citizens that used the ICT services more than once can be directly calculated by the percentage of returning visitors (43.5%), while the average time that citizens use the applications is 6 minutes and 38 seconds.

Citizens' level of satisfaction: Based on the data collected so far from the surveys and interviews over the three innovation cycles, the citizens' level of satisfaction is more than 80% for all developed services.

Here it should be mentioned that indicators measuring citizens' level of satisfaction from using the ICT services can only be collected through surveys in frequent time periods. Especially in the case of the last two indicators (citizens' perception on impact of innovative services on quality of life and ICT success rate) measure qualitative issues and cannot be measured easily. Based on the above, there is no way of retrieving this information automatically, although pop ups questioning the satisfaction/success of each service can be created and applied for each one of them.

8.2 Standardized values

Nº	Smart Economy	Method of measurement	Mean	Variance	Standard Deviation	Z-Scores			
						Bilbao	Vitry	Thermi	Bremen
1	Businesses in Smart Cities	Number of companies involved in the project (pilot).	108,50	43127,00	207,67	-0,49	-0,50	1,50	-0,51
		Number of businesses adopting or using the projects ICT services as part of their activity.	20,75	1313,58	36,24	-0,41	-0,54	1,50	-0,54
	AVERAGE					**-0,45**	**-0,52**	**1,50**	**-0,53**
2	Smart Services and Products	Number of developed and conceptualized commercial services that can be transferred/uptaken by businesses.	3,50	3,00	1,73	-0,29	-0,29	1,44	-0,87
	AVERAGE					**-0,29**	**-0,29**	**1,44**	**-0,87**
3	Innovative entrepreneurship	The number of licenses defined.	3,50	3,00	1,73	-0,29	-0,29	1,44	-0,87
		Number of companies that express interest in open data availability.	3,00	12,00	3,46	0,87	0,87	-0,87	-0,87
		Number of innovative technological business registrations based on the project results.	0,00	0,00	0,00	N/A	0,00	N/A	0,00
		Number of entrepreneurs using the project´s ICT services.	2,00	7,00	2,65	1,13	-0,38	N/A	-0,76
	AVERAGE					**1,00**	**0,16**	**-0,87**	**-0,54**

Nº	Smart Infrastructures	Method of measurement	Mean	Variance	Standard Deviation	Bilbao	Vitry	Thermi	Bremen
4	ICT infrastructures	Percentage of the city area covered by public wifi access.	18,33	158,33	12,58	-1,06	0,93	N/A	0,13

		Percentage of area covered by UMTS.	90,00	200,00	14,14	0,71	-0,71	N/A	N/A
		Percentage of area covered by LTE.	0,00	0,00	0,00	0,00	0,00	N/A	N/A
	AVERAGE					**-0,12**	**0,07**		**0,13**
5	Smart Transport	Amount of innovative ICT services that facilitate transport in the city.	2,25	0,25	0,50	1,50	-0,50	-0,50	-0,50
	AVERAGE					**1,50**	**-0,50**	**-0,50**	**-0,50**
6	Smart Public Infrastructures	Percentage of public buildings that support indoor navigation.	0,00	0,00	0,00	N/A	N/A	0,00	N/A
		Percentage of public infrastructures (public buildings, buses, parkings, transport systems, etc) equipped with NFC systems.	45,00	4050,00	63,64	N/A	0,71	-0,71	N/A
		Percentage of public infrastructures (public buildings, buses, parkings, etc.) equipped with smart cameras.	28,75	1706,25	41,31	-0,45	1,48	-0,70	-0,33
		Percentage of public infrastructures (public buildings, buses, parkings, etc) equipped with sensors.	33,67	2400,33	48,99	-0,67	1,15	N/A	-0,48
	AVERAGE					**-0,56**	**1,11**	**-0,47**	**-0,41**

Nº	Smart Governance	Method of measurement	Mean	Variance	Standard Deviation	Bilbao	Vitry	Thermi	Bremen
7	Transparent data	Amount of data available from public authorities that can be used effectively for new services	3,00	2,00	1,41	0,71	N/A	-0,71	N/A
		Number of project services that use open data.	1,33	0,33	0,58	-0,58	1,15	N/A	-0,58
	AVERAGE					**0,06**	**1,15**	**-0,71**	**-0,58**
8	Innovative public policy	Amount of public R&D expenditures as percentage of overall expenditures of a city	2,93	2,81	1,68	-1,15	0,64	N/A	0,52
	AVERAGE					**-1,15**	**0,64**	**N/A**	**0,52**
9	Smart public services	Number of project´s ICT services that solve or complement public services:	2,75	2,92	1,71	0,15	-0,44	1,32	-1,02
	AVERAGE					**0,15**	**-0,44**	**1,32**	**-1,02**
10	Public governance implication	Number of public organizations and department involved	5,00	6,67	2,58	0,39	-0,39	1,16	-1,16

		Number of public organizations and departments that use the project´s ICT service	4,25	6,92	2,63	0,67	-0,86	1,05	-0,86
	AVERAGE					**0,53**	**-0,62**	**1,10**	**-1,01**

№	Citizens in Smart Cities	Method of measurement	Mean	Variance	Standard Deviation	Bilbao	Vitry	Thermi	Bremen
11	Citizen ICT access	Percentage of citizens that have an internet subscription.	56,63	581,70	24,12	0,26	-1,10	N/A	0,84
	AVERAGE					**0,26**	**-1,10**	**N/A**	**0,84**
12	Citizens and ICT services	Amount of citizens that participate in the project	1010,00	1313400,00	1146,04	1,21	-0,80	0,43	-0,84
		Amount of citizens using the project ICT services.	2201,00	2837404,00	1684,46	-0,21	-1,04	1,36	-0,12
		Amount of citizens that used the ICT services more than once	1186,00	557765,33	746,84	-0,13	-1,32	1,03	0,42
		Average amount of time that citizens are using the ICT services	383,50	27069,38	164,53	1,35	0,40	0,09	N/A
	AVERAGE					**0,56**	**-0,69**	**0,73**	**-0,18**

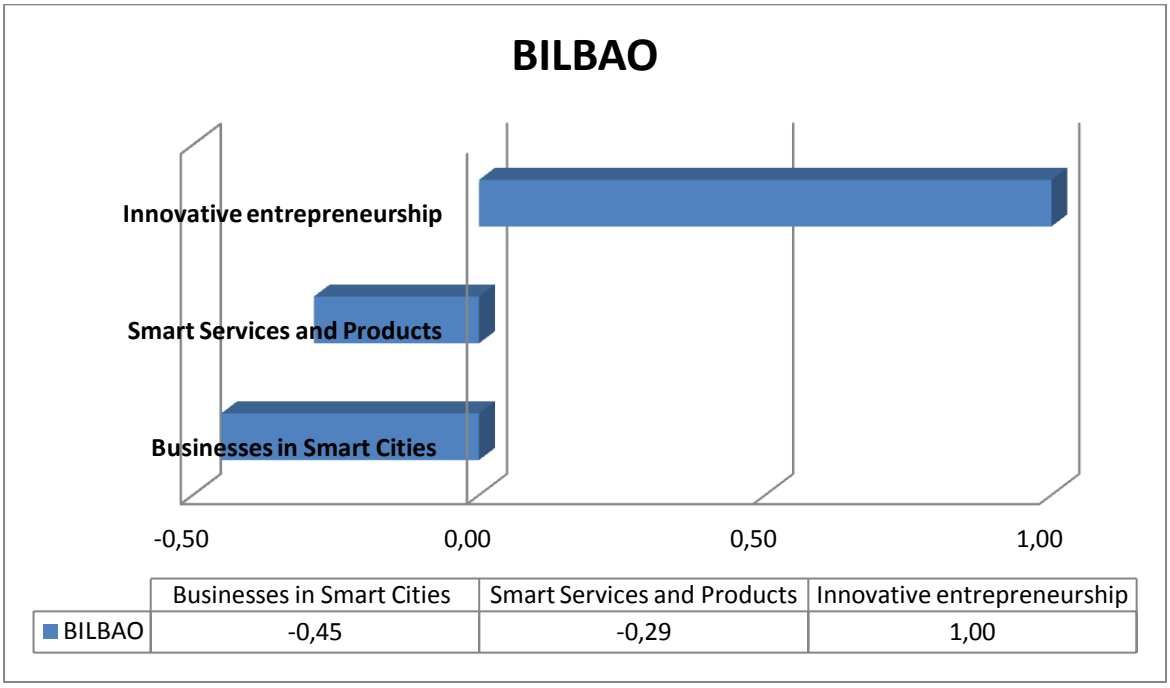
	Citizens level of satisfaction	Citizens´ level of satisfaction with ICT services	82,00	116,00	10,77	-1,11	1,30	-0,19	-0,19
13		Citizens´ perception on impact of innovative services on quality of life		0,45	0,67	1,00	Improve Mobility and save time	Positive impact	N/A
		ICT success rate	65,00	450,00	21,21	-0,71	0,71	N/A	N/A
	AVERAGE					**-0,27**	**1,00**	**-0,19**	**-0,19**

8.3 Comparisons

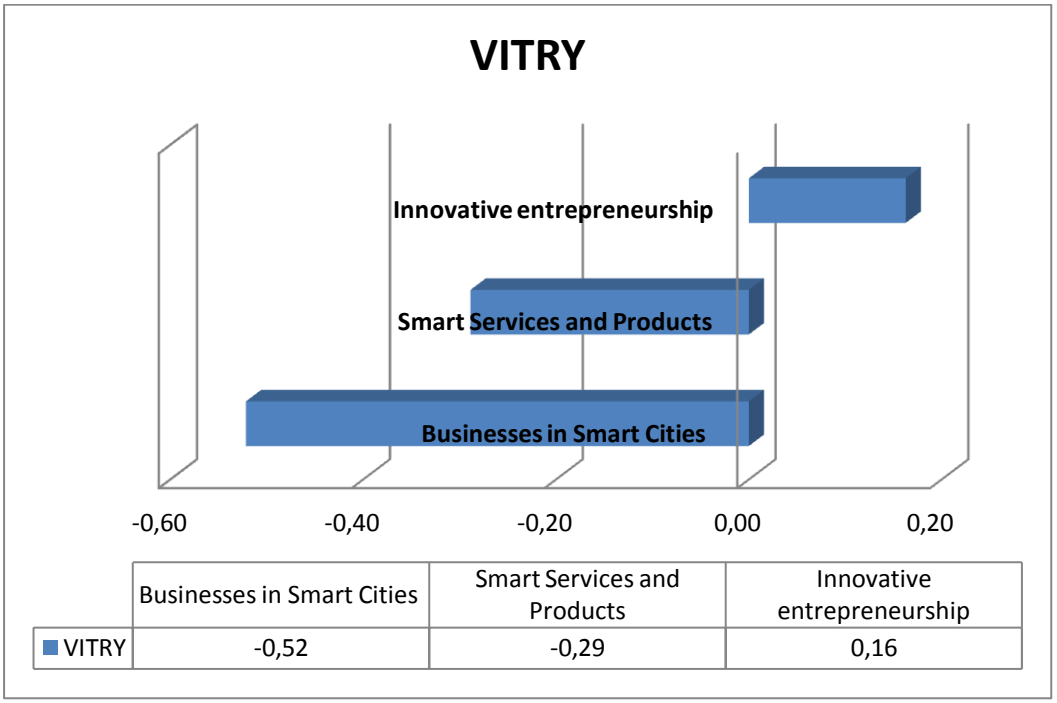
To be able to compare results on the level of the 13 factors and categories and to be able to compare finally the cities it is necessary to aggregate the values on the indicator level. The problem of using a direct addition is that not all the cities have available all the information requested in the indicators so it would lead to biased results. We are following the methodology proposed by the Vienna University of Technology in the model that they proposed for the ranking of 70 cities (http://www.smart-cities.eu/model.html): we are using the addition of the values for each factor but divided by the number of values added (the average). They used this method for allowing the inclusion of cities which do not cover all indicators.

In the following graphics we present the performance of the cities in the four categories of the Scoreboard:

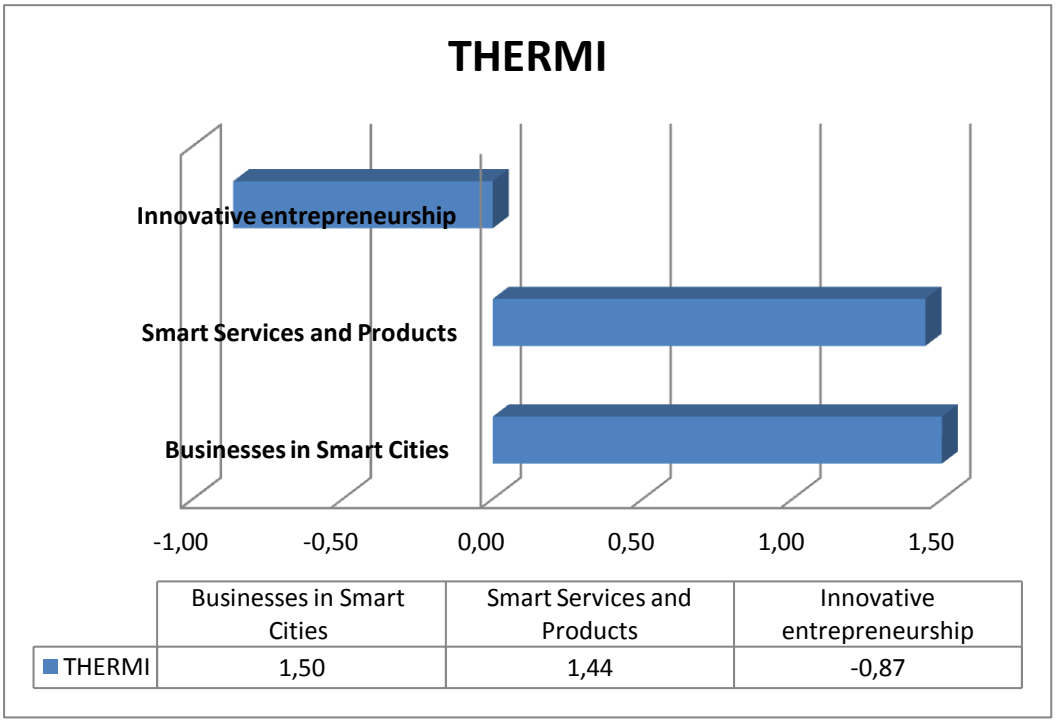
Smart Economy



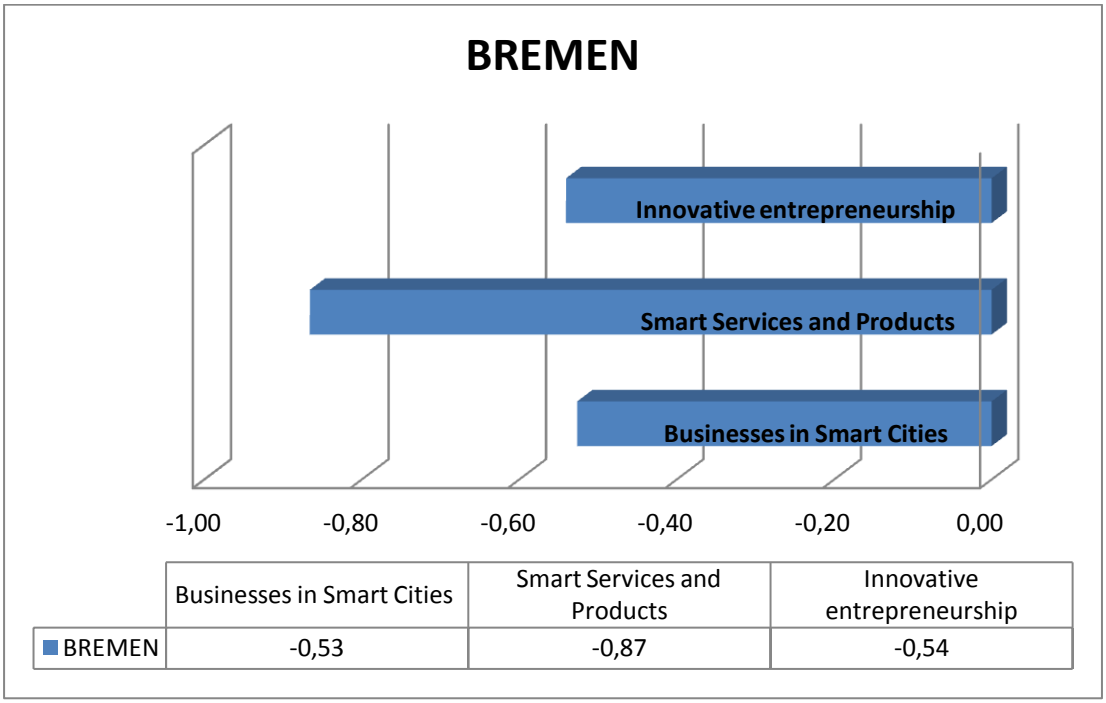
	Businesses in Smart Cities	Smart Services and Products	Innovative entrepreneurship
BILBAO	-0,45	-0,29	1,00



	Businesses in Smart Cities	Smart Services and Products	Innovative entrepreneurship
VITRY	-0,52	-0,29	0,16

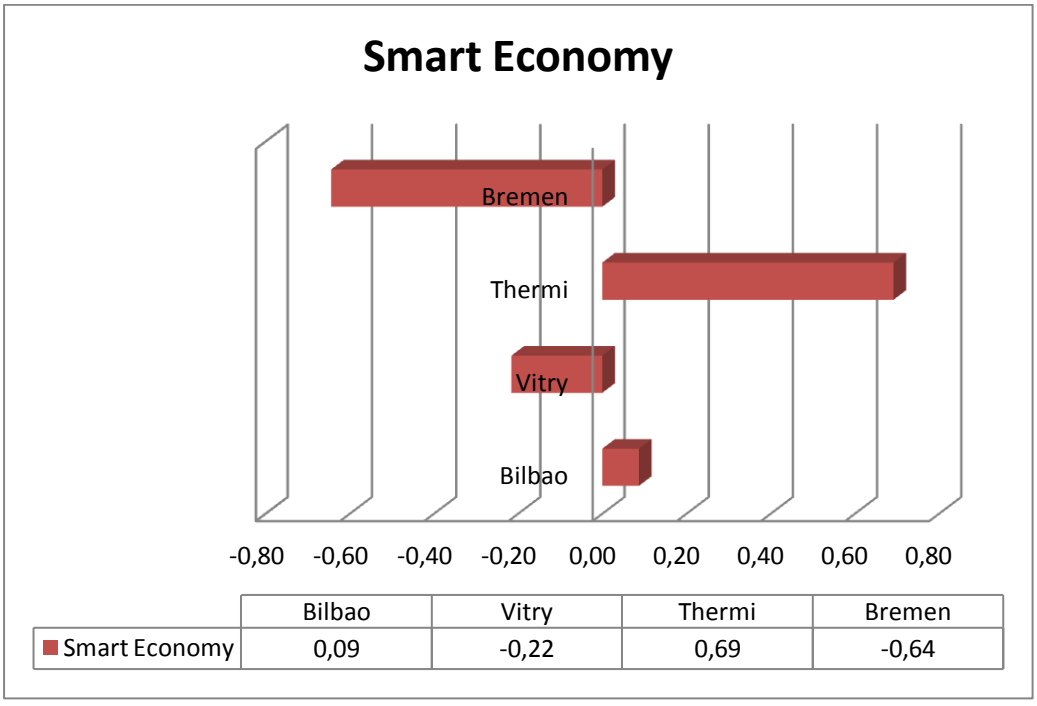


	Businesses in Smart Cities	Smart Services and Products	Innovative entrepreneurship
THERMI	1,50	1,44	-0,87



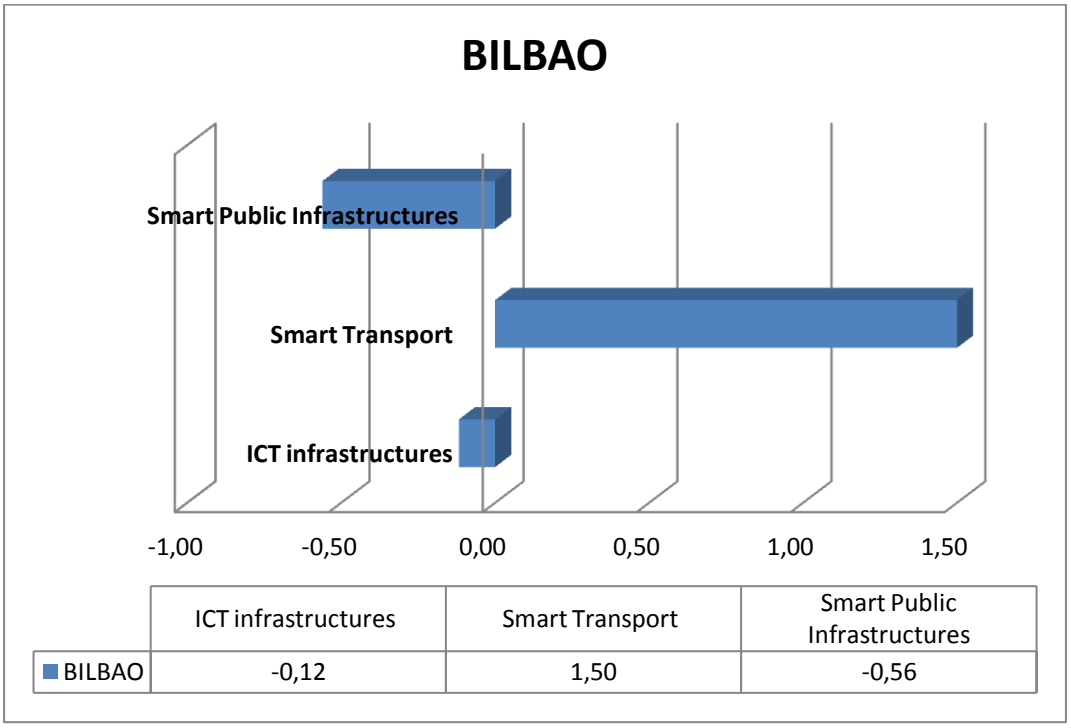
	Businesses in Smart Cities	Smart Services and Products	Innovative entrepreneurship
BREMEN	-0,53	-0,87	-0,54

Smart Economy: Overall comparative performance

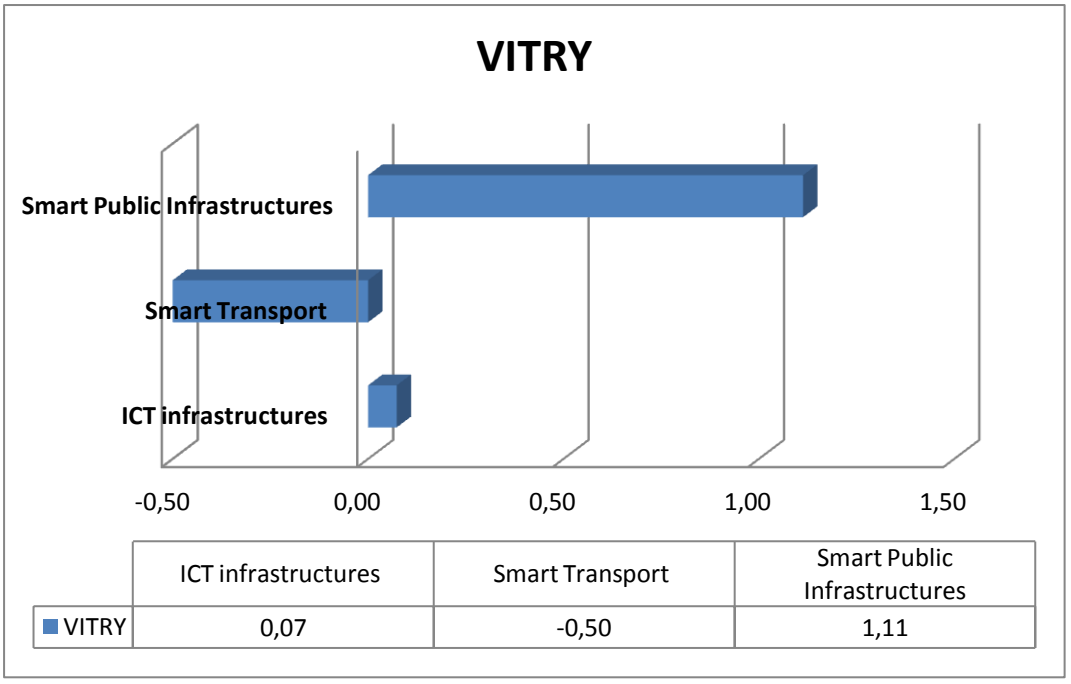


	Bilbao	Vitry	Thermi	Bremen
Smart Economy	0,09	-0,22	0,69	-0,64

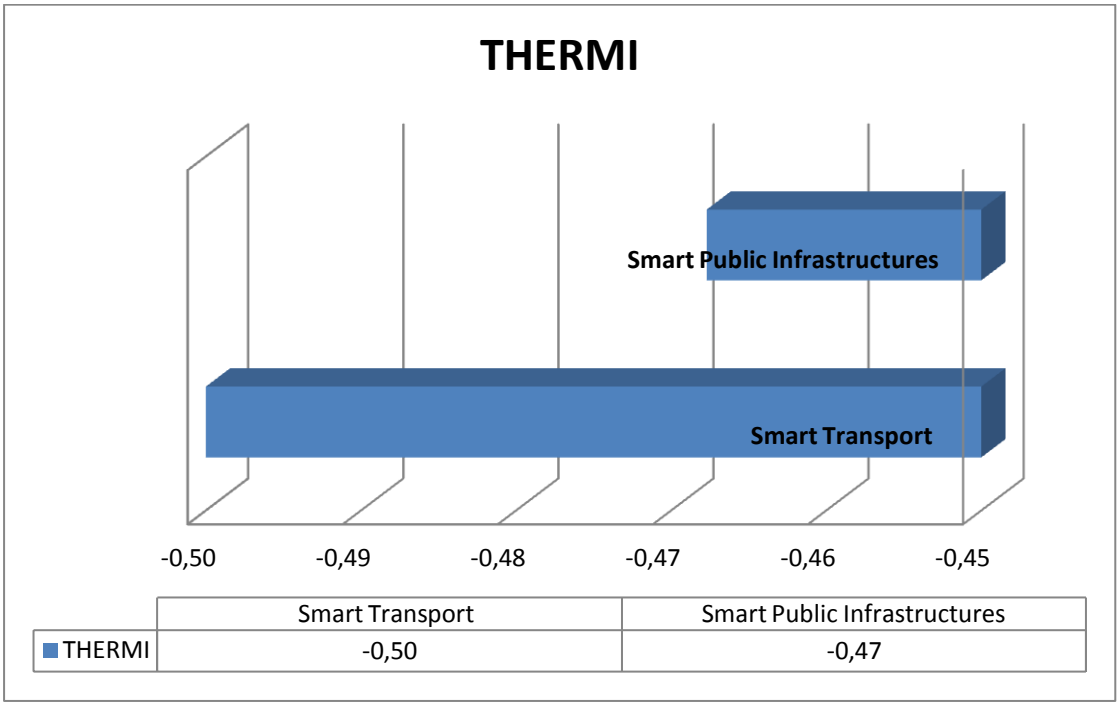
Smart Infrastructures



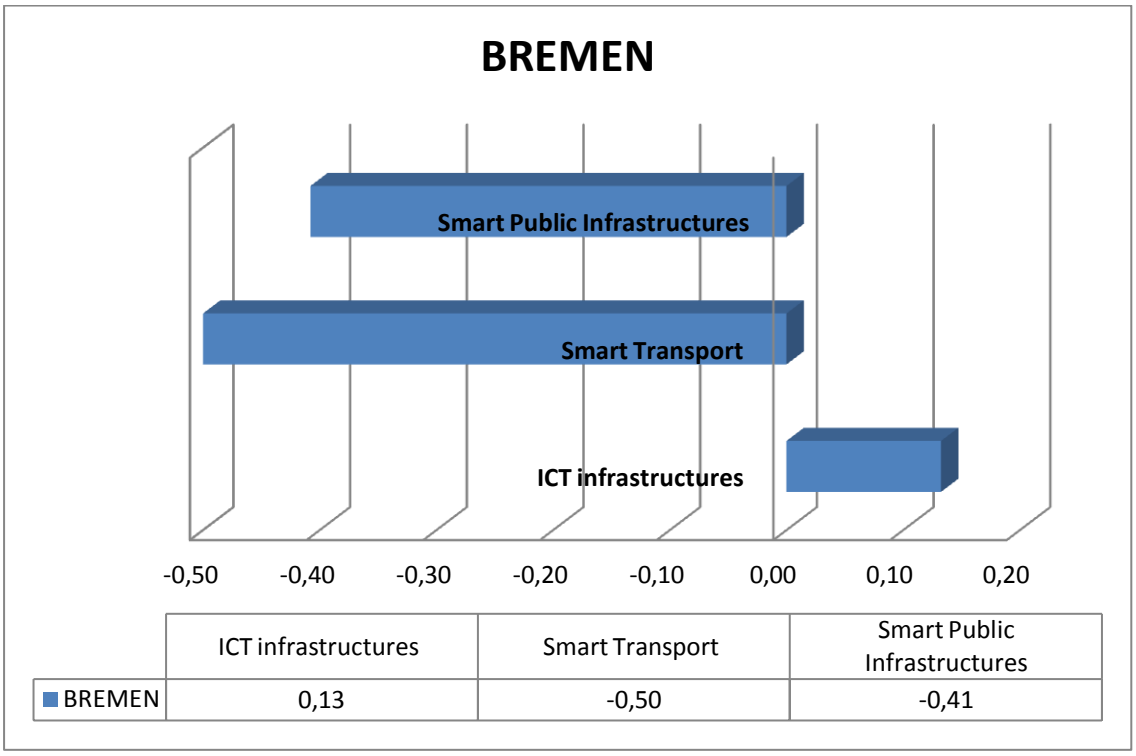
	ICT infrastructures	Smart Transport	Smart Public Infrastructures
BILBAO	-0,12	1,50	-0,56



	ICT infrastructures	Smart Transport	Smart Public Infrastructures
VITRY	0,07	-0,50	1,11

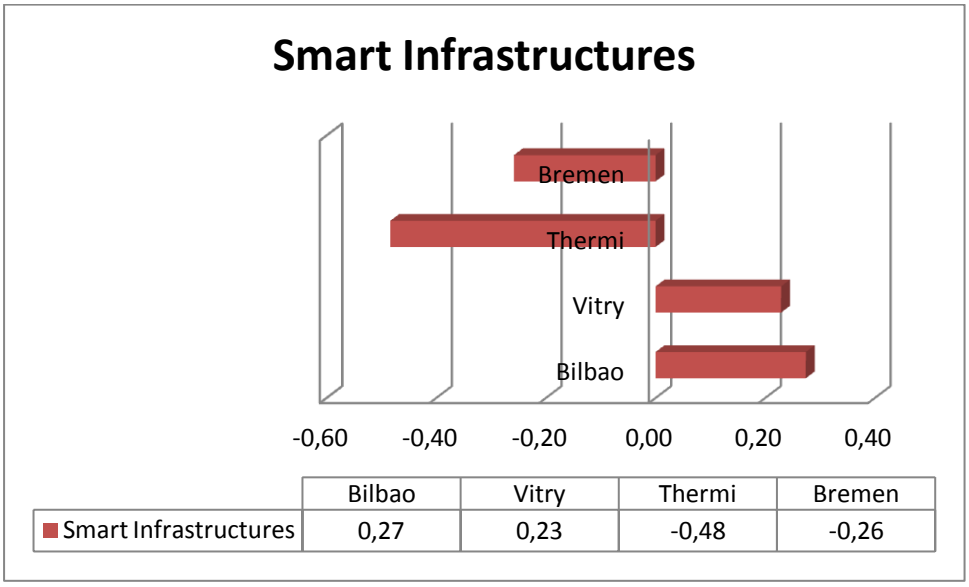


	Smart Transport	Smart Public Infrastructures
THERMI	-0,50	-0,47



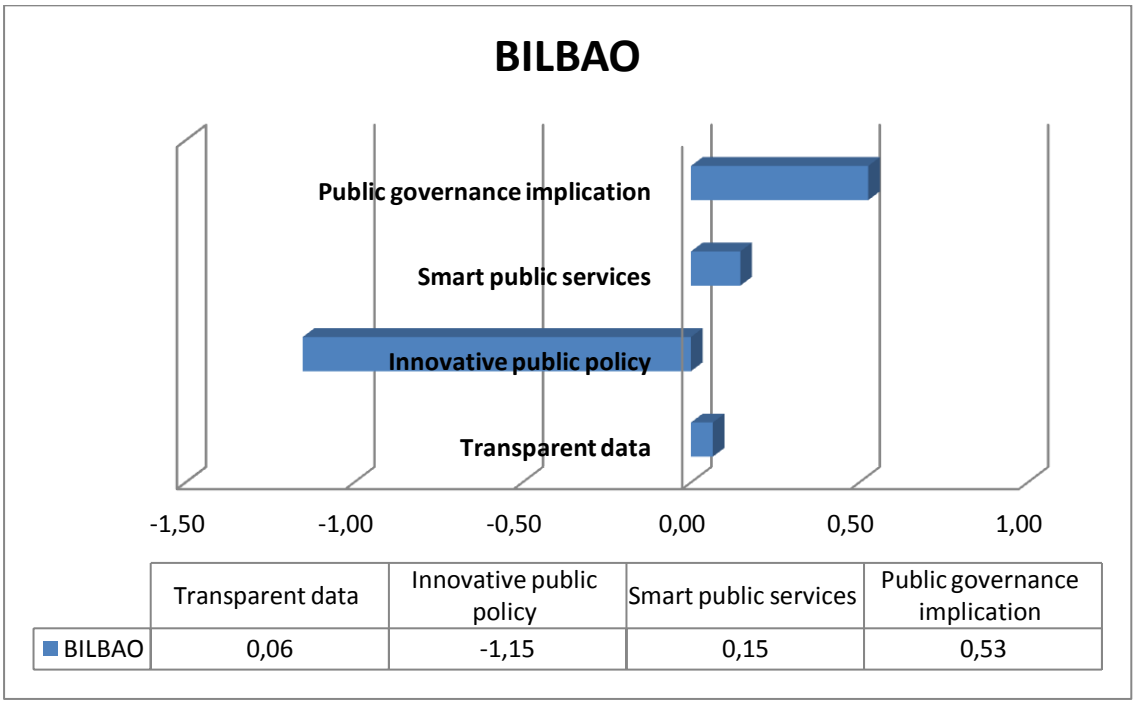
	ICT infrastructures	Smart Transport	Smart Public Infrastructures
BREMEN	0,13	-0,50	-0,41

Smart Infrastructures: Overall comparative performance

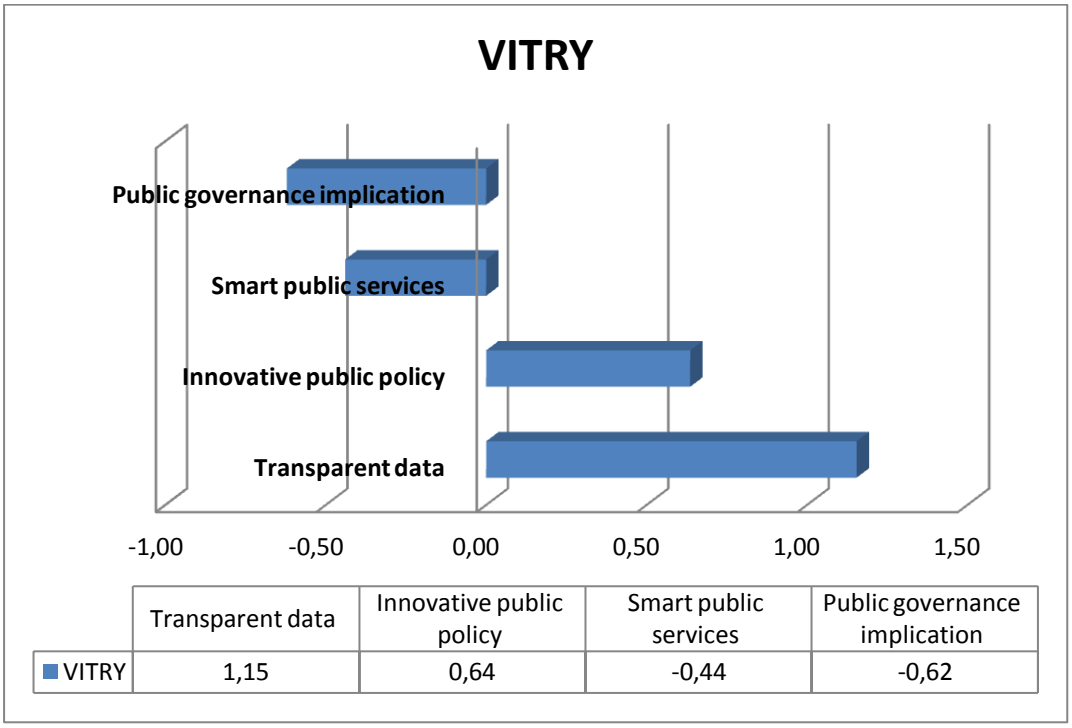


	Bilbao	Vitry	Thermi	Bremen
Smart Infrastructures	0,27	0,23	-0,48	-0,26

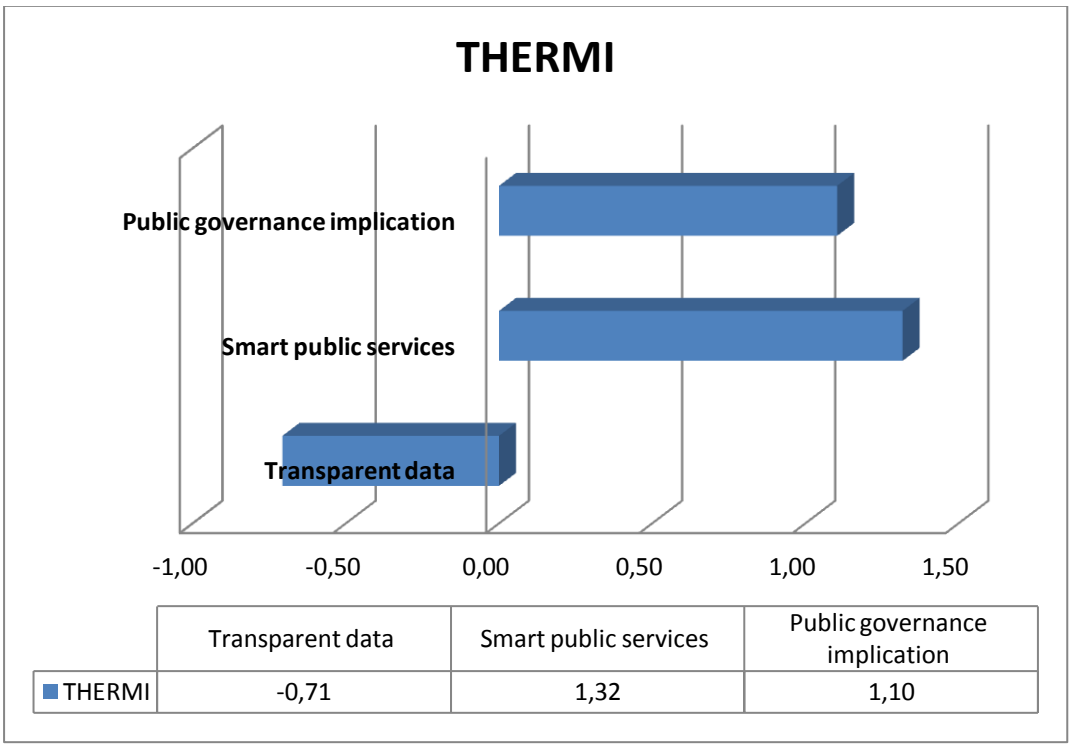
Smart Governance:



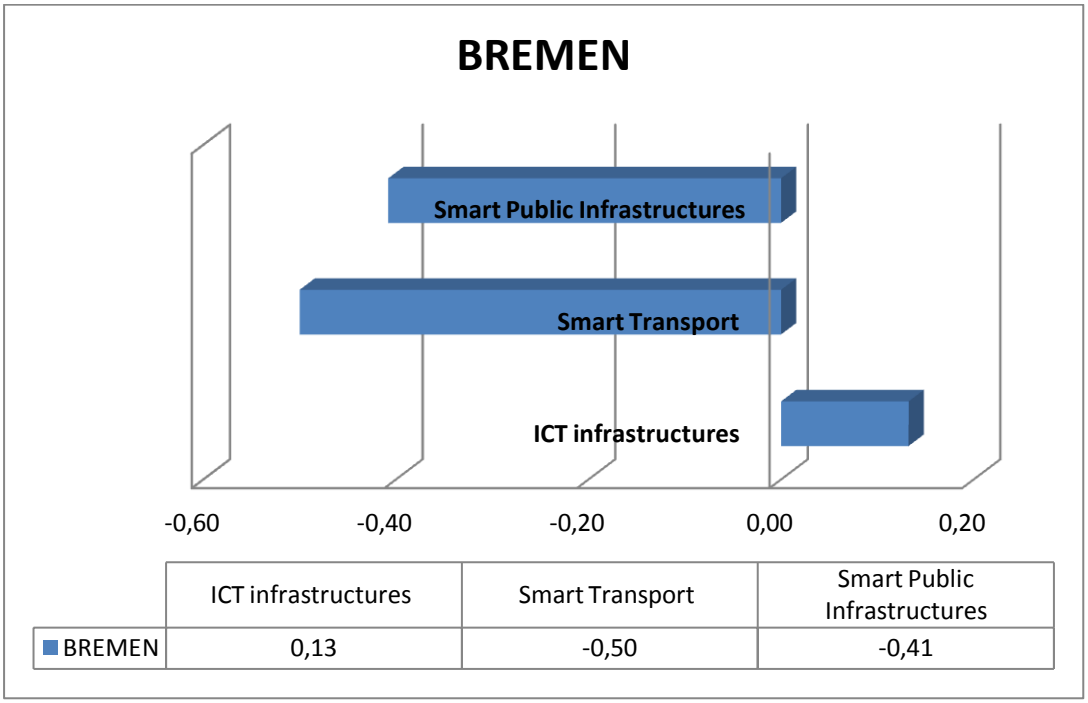
	Transparent data	Innovative public policy	Smart public services	Public governance implication
BILBAO	0,06	-1,15	0,15	0,53



	Transparent data	Innovative public policy	Smart public services	Public governance implication
VITRY	1,15	0,64	-0,44	-0,62

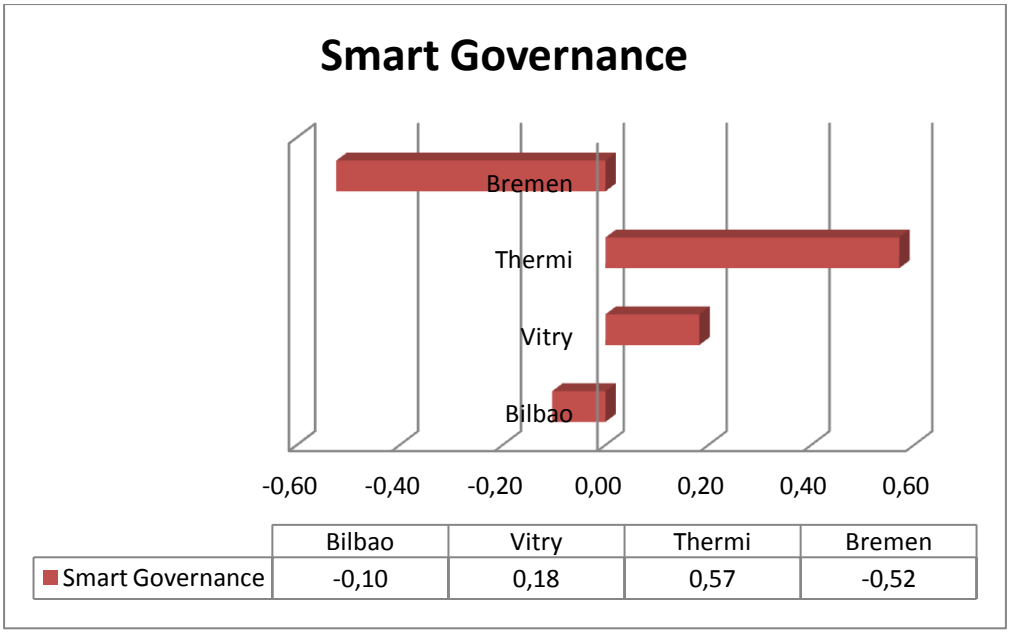


	Transparent data	Smart public services	Public governance implication
THERMI	-0,71	1,32	1,10



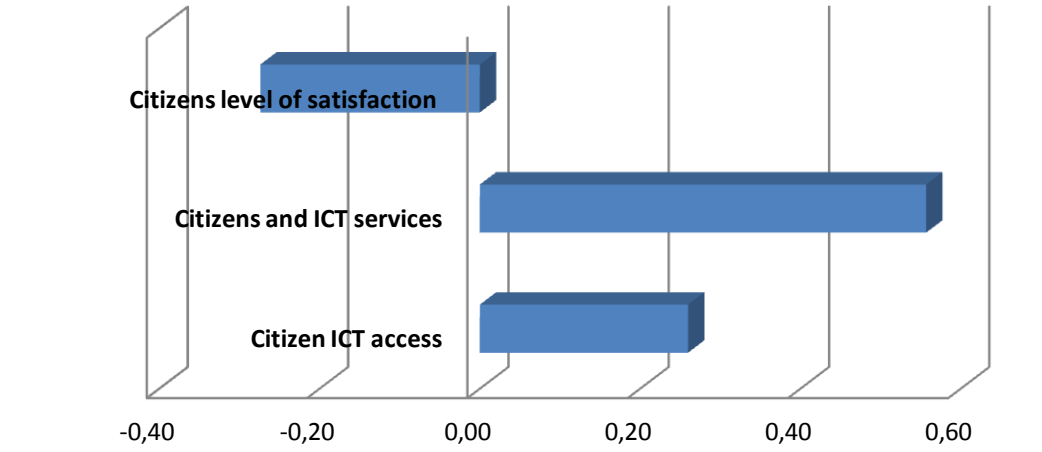
	ICT infrastructures	Smart Transport	Smart Public Infrastructures
BREMEN	0,13	-0,50	-0,41

Smart Governance: Overall comparative performance

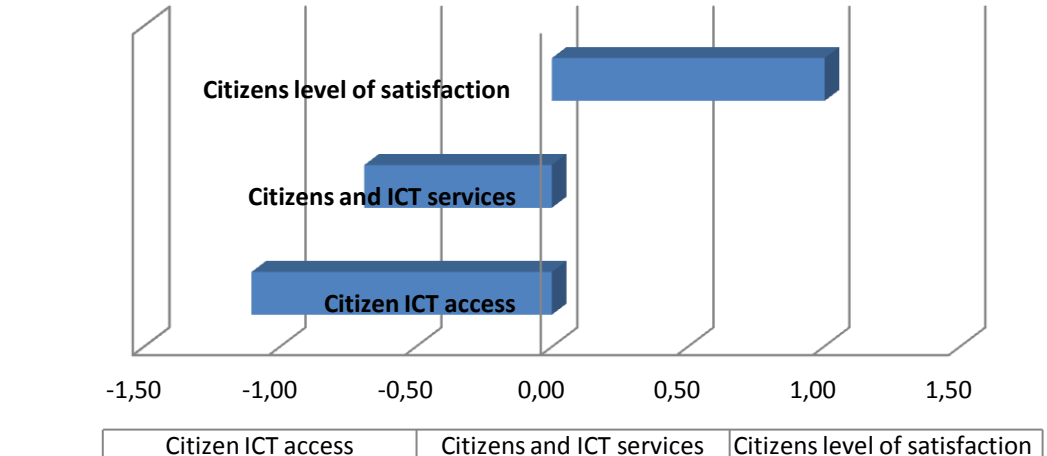


	Bilbao	Vitry	Thermi	Bremen
Smart Governance	-0,10	0,18	0,57	-0,52

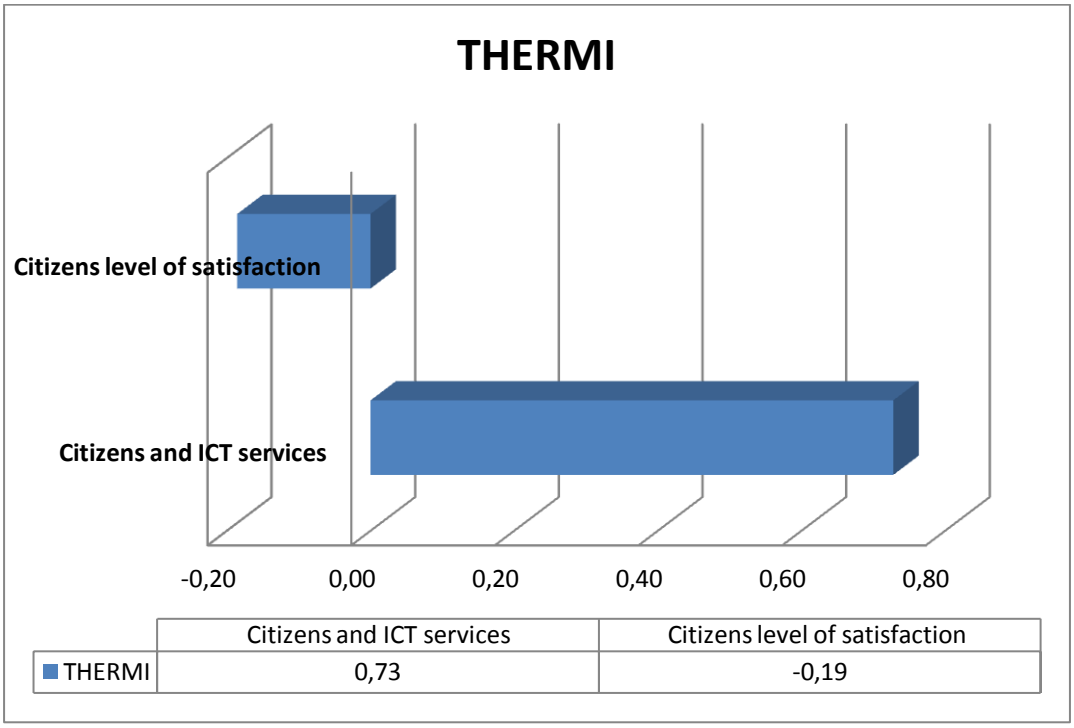
Citizens in Smart Cities



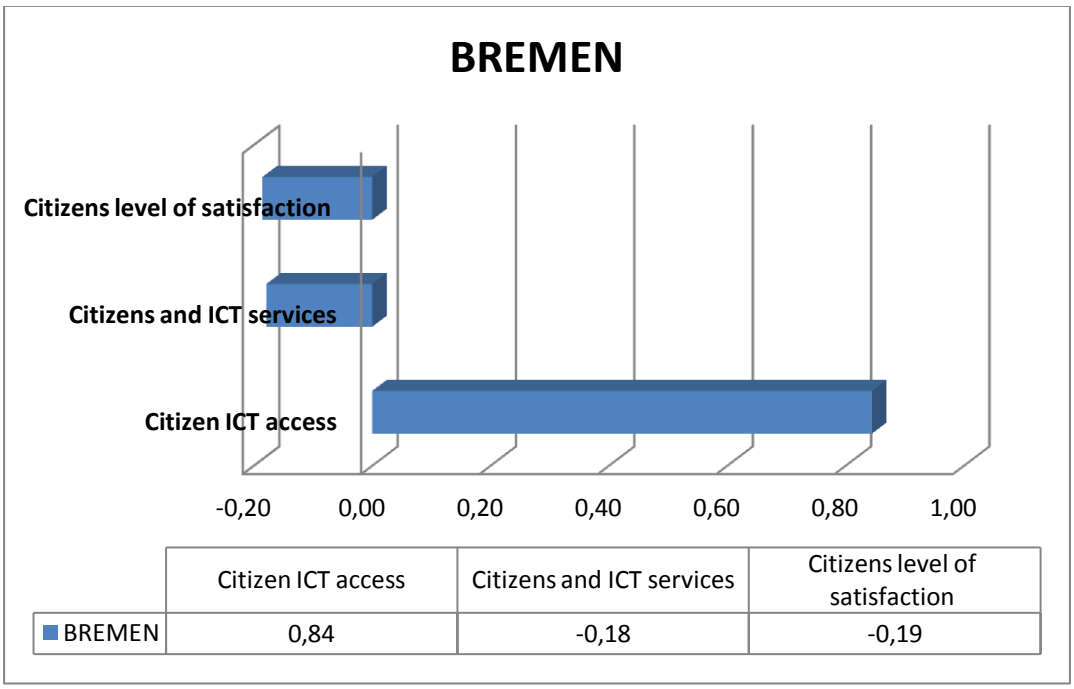
	Citizen ICT access	Citizens and ICT services	Citizens level of satisfaction
BILBAO	0,26	0,56	-0,27



	Citizen ICT access	Citizens and ICT services	Citizens level of satisfaction
VITRY	-1,10	-0,69	1,00

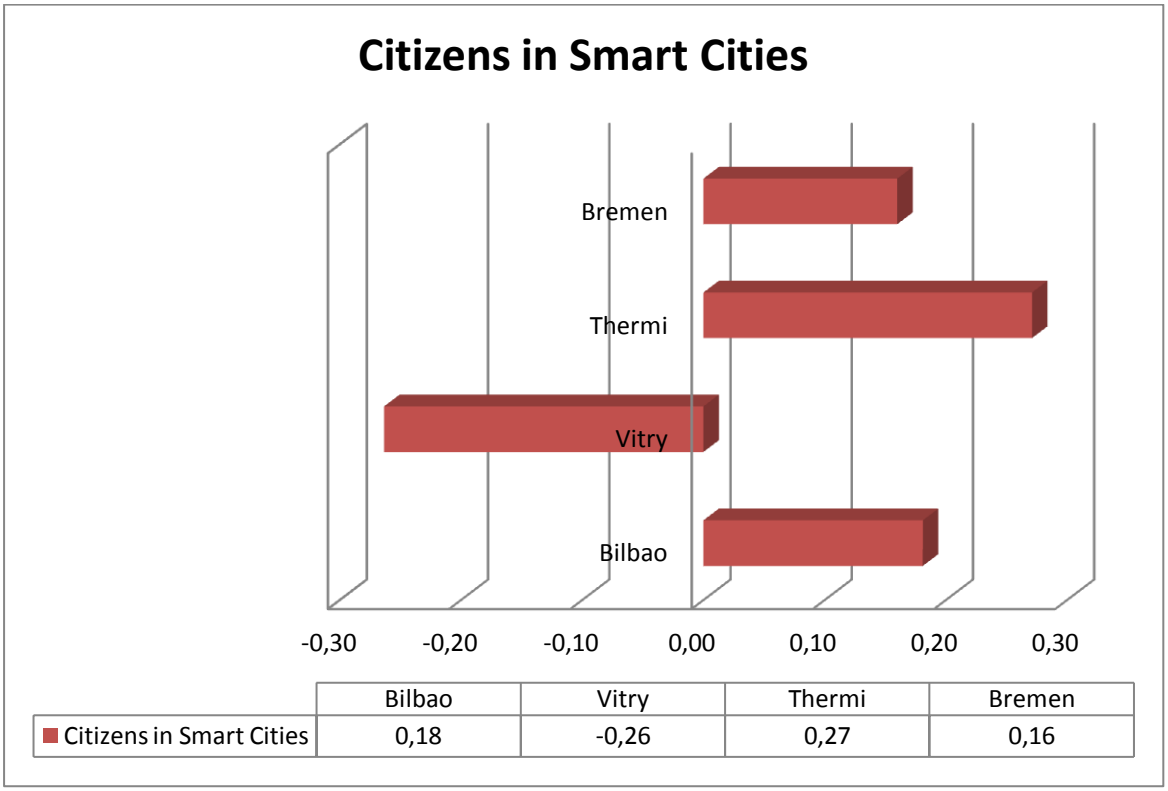


	Citizens and ICT services	Citizens level of satisfaction
THERMI	0,73	-0,19



	Citizen ICT access	Citizens and ICT services	Citizens level of satisfaction
BREMEN	0,84	-0,18	-0,19

Citizens in Smart Cities: Overall comparative performance



	Bilbao	Vitry	Thermi	Bremen
Citizens in Smart Cities	0,18	-0,26	0,27	0,16

8.4 Rankings

	Smart Economy
1	Thermi
2	Bilbao
3	Vitry
4	Bremen
	Smart Infrastructures
1	Bilbao
2	Vitry

3	Bremen
4	Thermi
Smart Governance	
1	Thermi
2	Vitry
3	Bilbao
4	Bremen
Citizens in Smart Cities	
1	Thermi
2	Bilbao
3	Bremen
4	Vitry

Considering the partial performance of the pilots in the different categories we can obtain the final ranking by the addition of the partial rankings showed before (considering that the first score is the lowest one).

Final Ranking		
#	**Pilot**	**Addition of the partial rankings**
1	Thermi	7
2	Bilbao	8
3	Vitry	11
4	Bremen	14

10. Conclusions

The main purpose of this deliverable is to give the final scoreboard indicator scheme that can used to measure the impact of the PEOPLE project on the local areas of the pilots, defined here as Smart Cities. This definition has been made based on a theoretical framework of Smart Cities and the definition of the four most relevant dimensions of a city for the PEOPLE project.

In this iteration of the Scoreboard deliverable we present the result and a comparative analysis of the presented information. We are presenting a final ranking showing an estimation (through indicators) o the impact that PEOPLE project had in the different local areas of the pilots. Nevertheless we have to make a very important consideration. The methodological framework that was followed (taken from the framework defined by the Vienna University of Technology, one of the most accepted frameworks for the ranking of Smart Cities) is meant for the comparison of a large number of cities. Provided that the methodology is based on the standardization of indicators values and given that the very notion of "standard" depends on the information provided by the cities for the indicators (it's a *comparative* analysis), taking into account just four values per indicator may (and for sure has happened in this analysis) to a biased valorization of the notion of standard when it comes to value the universe of Smart Cities.

As was mentioned before when analyzing the normalized values for the progress indicators in D1.7.4, this analysis by no means intends to present *an absolute measure* of the impact that PEOPLE project had in the local areas of the pilots. The pilots have been deployed in very different contexts with its own particularities that may lead to very important discrepancies in the indicator values obtained. The pilots may have perfectly met the foreseen impact in their communities but, provided that this is a *comparative analysis*, always some pilot must be ranked first. Any conclusion extracted from this analysis should be carefully contrasted using unquestionable evidence.

Nevertheless, we think that the exercise done in the preparation of the present scoreboard is very useful for at least two purposes:

- To provide a tool for the cities in PEOPLE project to compare their future *level of smartness* with the one measured in this period. The impact that PEOPLE project will have in the local communities will change over time, provided that change takes time, so, the comparative impact analysis is likely to be changed in the next years according to the development of the opportunities raised by the development of PEOPLE project services.

- To provide a very useful tool for other cities that want to measure the impact generated by the development of services in other projects in its local areas. The methodology that we have followed and the results that have been obtained will be publicly available in this deliverable and the wiki of the project for further consultation.

11. References

- Caragliu, et all. *Smart Cities in Europe*, ´3rd Central European Conference in Regional Science´, (2009) 45-59.
- Dirks, S., M. Keeling and J. Dencik, *How Smart is your City? Helping cities measure progress* ´IBM Global Business Institute´ (2009).
- Holland, R.G., *Will the real Smart City please stand up?* ´City´, (2008), 12-3, 303-320.
- Net!Works European Technology Platform Working Group, *Smart Cities Applications and Requirements* ´White Paper´ (2011), 10.
- Schaffers, H., N. Komninos, M. Pallot, B. Trousse, M. Nilsson, A. Oliveira, *Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation* ´FIA Book 10´ (2011), 431-446.
- Vienna Centre of Regional Science, *Smart Cities: ranking of European medium sized cities*, www.smart-cities.eu (2007).
- http://ec.europa.eu/enterprise/policies/sme/ (2011)
- www.smart-cities.eu (2011)
- www.ibm.com/smarterplanet (2011)
- http://howto.commetrics.com/methodology/statistics/normalization/

12. Annexes

Annex 1 Survey Example

Citizen Satisfaction Survey for PEOPLE ICT Service

Thank you for participating in our survey. Your feedback is important.

Please take a few moments to complete our ICT service satisfaction survey. Your feedback is important to us. Your responses will help us to address any issues that you may have as well as to better target our services to meet your needs. Your responses will be kept confidential and will not be used for any purpose other than research conducted by the PEOPLE project. This survey will take approximately 2 minutes to complete.

1 stands for very satisfied, 2 for satisfied, 3 neutral, 4 for not so satisfied and 5 for not at all satisfied.

The user-friendliness of the service	1	2	3	4	5
The operation of the service	1	2	3	4	5
The user options/the versatility of the service	1	2	3	4	5
The quality of the service	1	2	3	4	5
The attractiveness/look of the service	1	2	3	4	5
The degree of innovativeness of the product/the service	1	2	3	4	5
The added value of the service over other ICT services you have experience with.	1	2	3	4	5
How satisfied are you in general about the Service of the PEOPLE project?	1	2	3	4	5