Smart Cities Concept and Challenges: Bases for the Assessment of Smart City Projects

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Abstract. ASCIMER (Assessing Smart Cities in the Mediterranean Region) is a project developed by the Universidad Politecnica of Madrid (UPM) for the EIBURS call on "Smart City Development: Applying European and International Experience to the Mediterranean Region".

Nowadays, many initiatives aimed at analysing the conception process, deployment methods or outcomes of the -referred as- Smart City projects are being developed in multiple fields. Since its conception, the Smart City notion has evolved from the execution of specific projects to the implementation of global strategies to tackle wider city challenges. ASCIMER's project takes as a departure point that any kind of Smart City assessment should give response to the real challenges that cities of the 21st century are facing. It provides a comprehensive overview of the available possibilities and relates them to the specific city challenges.

A selection of Smart City initiatives will be presented in order to establish relations between the identified city challenges and real Smart Projects designed to solve them. As a result of the project, a Projects Guide has been developed as a tool for the implementation of Smart City projects that efficiently respond to complex and diverse urban challenges without compromising their sustainable development and while improving the quality of life of their citizens.

Keywords: Smart city projects · Challenges · Assessment · Mediterranean region

1 Introduction

Cities are the main poles of human and economic activity. They hold the potential to create synergies allowing great development opportunities to their inhabitants. However, they also generate a wide range of problems that can be difficult to tackle as they grow in size and complexity. Cities are also the places where inequalities are stronger and, if they are not properly managed, their negative effects can surpass the positive ones.

Urban areas need to manage their development, supporting economic competitiveness, while enhancing social cohesion, environmental sustainability and an increased quality of life of their citizens.

With the development of new technological innovations -mainly ICTs- the concept of the "Smart City" emerges as a means to achieve more efficient and sustainable cities.

Since its conception, the Smart City notion has evolved from the execution of specific projects to the implementation of global strategies to tackle wider city challenges. Thus, it is necessary to get a comprehensive overview of the available possibilities and relate them to the specific city challenges.

2   ASCIMER Project

ASCIMER (Assessing Smart Cities in the Mediterranean Region) is a three-year research project developed by the Universidad Politecnica of Madrid (UPM) for the EIBURS call on "Smart City Development: Applying European and International Experience to the Mediterranean Region".

Nowadays, many initiatives aimed at analysing the conception process, deployment methods or outcomes of the -referred as- Smart City projects are being developed in multiple fields. However, there is a lack of standardized metrics and methodologies to help to assess, prioritize, finance, implement, manage and replicate this kind of projects.

The overall goal of the ASCIMER project is to develop a comprehensive framework to help public and private stakeholders to make informed decisions about Smart City investment strategies and to build skills for evaluation and prioritization of this kind of projects, including solving difficulties regarding deployment and transferability.

To sum up, the goals of the project, along its three years of duration are:

– To define the Smart City concept and to understand how it can contribute to achieve urban development priorities.
– To develop a methodology to assess and prioritize Smart City projects.
– To develop guidelines of implementation and management Smart City Projects.
– To characterize Mediterranean City Challenges and to develop a transferability strategy of Smart City projects. This objective will be part of the other three above.

Here, some of the outputs of the first year of research are presented. The objective of this first Work Package of research was the development of the Smart City concept and the identification of the main urban development priorities with a special focus on the Mediterranean area. Besides some Smart City initiatives have been analysed and summarized in a Projects Guide.

The information has been collected through website search, field visits and a two-day workshop where experts from different fields and countries have been gathered to talk about the experiences they have been involved in, both in the academic and professional world. During the workshop, examples from both northern and southern Mediterranean cities were explained and discussed giving the opportunity to understand the current socioeconomic reality of the cities and what are the different challenges they are facing. By gathering all these experts and different points of view, the

workshop enabled the research team to acquire a global knowledge of the present and future of the Smart Cities (Fig. 1).

Fig. 1. ASCIMER project development.

3 Smart City Concept

Despite there is some kind of consensus that the label Smart City represents innovation in city management, its services and infrastructures, a common definition of the term has not yet been stated. There is a wide variety of definitions of what a Smart City could be. However, two trends can be clearly distinguished in relation with what are the main aspects that Smart Cities must take into consideration [4].

On the one hand there is a set of definitions that put emphasis just on one urban aspect (technological, ecological, etc.) leaving apart the rest of the circumstances involved in a city. This group of mono-topic descriptions are misunderstanding that the final goal of a Smart City is to provide a new approach to urban management in which all aspects are treated with the interconnection that takes place in the real life of the city. Improving just one part of an urban ecosystem does not imply that the problems of the whole are being solved.

On the other hand there are some authors that emphasize how the main difference of the Smart City concept is the interconnection of all the urban aspects. The tangled problems between urbanization are infrastructural, social and institutional at the same time and this intertwining is reflected in the Smart City concept. From the definitions, it can be noticed that infrastructures are a central piece of the Smart City and that technology is the enabler that makes it possible, but it is the combination, connection and integration of all systems what becomes fundamental for a city being truly smart [8]. From these definitions it can be inferred that the Smart City concept implies a comprehensive approach to city management and development. These definitions show a balance of the technological, economic and social factors involved in an urban ecosystem. The definitions reflect a holistic approach to the urban problems taking advantage of the new technologies so that the urban model and the relationships among the stakeholders can be redefined [1–3, 6, 8, 9].

3.1 ASCIMER´S Working Definition

The first step of the project was to develop a Smart City definition that will act as a guideline for the selection of projects in this field and the development of the assessment methodology. Thus, the main issues that a Smart City must take into account have been defined.

The main innovations coming from the Smart City concept are the rise of a user-centric approach that considers urban issues from the perspective of the citizen's needs, the engagement of citizens in the city functioning, or a truly holistic approach to urban challenges that becomes essential for Smart Strategies.

This last innovative factor explains why the Smart City is a concept that surpasses earlier maybe similar ones that usually miss the holistic approach, focusing only on improving either human, technological or environmental factors.

ICT-based solutions are the key element that differentiates and confers potential to the Smart City, however simply deploying expensive technologies in the city is a misunderstanding of the concept.

The development of Smart Strategies must be run on the basis of a multi-stakeholder municipally-based partnership. Bottom-up approaches ought to be allowed to coexist with the more traditional top-down ones. Also Smart City solutions must apply inclusive approaches.

As seen, the definition of a Smart City is a very broad concept that has technology as a basic aspect, coupled with social and human capital development.

Regarding all the analysed aspects that are key to define a Smart City, the ASCIMER's Working definition has been developed:

"A Smart City is an integrated system in which human and social capital interact, using technology-based solutions. It aims to efficiently achieve sustainable and resilient development and a high quality of life on the basis of a multistakeholder, municipality based partnership."

4   Smart City Challenges

As cities continue booming tirelessly, their challenges need to be carefully thought through so that population growth, economic development and social progress walk on the same path. Although most of global GDP is produced in cities, not everything happening within these agglomerations implies positive externalities. Cities are also the places where inequalities are stronger and, if they are not properly managed, the negative effects can surpass the positive ones. The Smart City model can lead to a better city planning and management and thus, to the achievement of a sustainable model of urban growth.

In ASCIMER's first year of work, challenges have been identified and classified in different dimensions in order to facilitate next steps of the project. Analysing the urban environment, research works deal with a different number of fields to frame the city. We have identified in the reviewed literature that they can all be allocated within six main City Dimensions: Governance, Economy, Mobility, Environment, People and Living [5].

They represent the specific aspects of a city upon which Smart Initiatives impact to achieve the expected goals of a Smart City strategy (sustainability, efficiency and high quality of life). Technology itself is not considered an action field, but an enabler that improves the efficiency of the projects.

Within each of the Dimensions different City Challenges have been identified both for the northern Mediterranean cities, and for the southern and eastern Mediterranean ones. The cities considered in this paper as belonging to the North Mediterranean Region are those located in countries of the European Union. The countries in the South and East Mediterranean region that have been considered in the study are: Morocco, Algeria, Tunisia, Lybia, Egypt, Jordan, Israel, Lebanon, Syria and Turkey.

Twenty nine Challenges have been identified in total for the northern ones. Among those, twenty related to just one Dimension. And nine multi-Dimension challenges.

For the southern cities twenty Challenges have been identified, eleven of them concerning just one city dimension while the other nine correspond to two or more.

4.1   City Challenges in European Cities

Nowadays cities have many different fields to work on so that they can become better places for living. Demographic changes and the financial crisis have brought to light the urgency of facing these city challenges. But it is not only a matter of the challenges that cities must face today, but the future problems of cities must be taken into account in an integrated way, as proposed in the document of the European Commission "Cities of Tomorrow". Decisions in urban planning and management have long term consequences. Although following this holistic approach, all these challenges can be classified in relation to the Smart City action fields, as shown in Table 1.

Table 1. City challenges in European cities.

Governance	Economy	Mobility	Environment	People	Living
Flexible governance	Unemployment	Sustainable mobility	Energy saving	Unemployment	Affordable housing
Shrinking cities	Shrinking cities	Inclusive mobility	Shrinking cities	Social cohesion	Social cohesion
Territorial cohesion	Economic decline	Multimodal transport system	Holistic approach to environmental and energy issues	Poverty	Health problems
Combination of formal and informal government	Territorial cohesion	Urban ecosystems under pressure	Urban ecosystems under pressure	Ageing population	Emergency management
	Mono-sectoral economy	Traffic congestion	Climate change effects	S.diversity as source of innovation	Urban sprawl
	Sust. local economies	Non-car mobility	Urban sprawl	Cyber Security	Safety and Security
	Social diversity as source of innovation	ICT infrastructure deficit			Cyber Security
	ICT infrast. deficit				

The main challenges that cities face in the Smart Governance action field are related with the urgent need for a change of government model.

Governance models will face the challenge of making themselves more flexible allowing to combine their top-down policies with bottom-up initiatives and also with informality. Demographic changes and territorial cohesion are the other two main challenges to face.

Challenges in the Smart Economy action field are related to the productive structure of the city. After the economic crisis, urban regions have understood the convenience of not focusing their productive model on just one economic sector. Enhancing the creation of a multi-sectoral economy would make cities more resilient to economic downturns, exploiting the unique conditions of each urban agglomeration within a certain region and interconnecting their productive networks can improve this resistance.

Achieving a sustainable, inclusive and efficient mobility system for goods and people is the overall challenge to be dealt with in the Smart Mobility action field. Implementing a multimodal public transport system, fostering alternatives to the car-based mobility and making public transport reachable and available to all citizens are the three main axes that will allow reducing congestion and pollution in cities and improving connectivity.

In the Smart Environment action field different challenges related with the built and natural environment can be found. On one hand there is the need of reducing land consumption for the extension of our cities. Avoiding urban sprawl and looking for more dense and liveable cities will enhance a mix of uses and the concentration of population, reducing the use of the car. On the other hand, the reduction of energy consumption, pollution and CO_2 emissions is a growing ecological demand for achieving a sustainable development. Improving social cohesion and quality of life are the main challenges to face in the Smart People action field. An enriching community life is the final goal, and to achieve so, it is necessary to take initiatives to solve the high levels of unemployment in cities; as well as using the demographic movements and mix of population as an opportunity for innovation, taking into consideration all citizens independently of their age, gender, culture or social condition. The main challenges in this field are related with the supply of housing, health conditions, and crime rate situation. These three aspects, together with the social cohesion of the population are the main issues that set difference for a city to be able to talk about having a good quality of life.

4.2   South and East Mediterranean Challenges

As stated in the UN-Habitat report "The state of African cities 2014" [9] demographic pressures, rapid urbanization and environmental changes are producing more negative urban externalities than positive ones in the majority of the south Mediterranean cities. These cities are growing rapidly in population but their development model is far away from a sustainable one. Due to their less developed situation, in comparison with the north Mediterranean cities, the challenges that these cities face are much more oriented towards fulfilling a basic services provision to their inhabitants.

The South Mediterranean territory is highly urbanized, more than a half of its population lives in cities, but the development models that have been followed have an important influence of past European ones that did not take into account the particularities of the south Mediterranean society. Development models for these urban areas should be revised in order to include the specific requirements of their societies, such as the informality as a way of urban development, the awareness of the lack of certain basic services or the particular conditions of the Government models.

The main challenges of the South Mediterranean cities are related with the scarcity of resources, such as fresh water or food supply. This challenge will become greater as the effects of the climate change continue. Severe droughts are expected to increase during the following years, and so will do the urgency for water supply and the diminishing of the agriculture production. Besides, the high infrastructure deficit that these countries have, with their mobility, water and energy networks in bad conditions result in the small amount of resources available not being as optimized as they could be. Improving the deployment of the supply networks is as important as rising the efficiency of the existing ones, so that the loss in the distribution of the basic utilities is reduced to a minimum.

Table 2. South & East-Mediterranean city challenges.

Governance	Economy	Mobility	Environment	People	Living
Low urban institutional capacities	High infrastructures deficit	Lack of public transport	Scarcity of resources	Urban poverty and inequality	Slum proliferation
Instability in governance	Shortage in access to technology	High infrastructures deficit	Water scarcity	Shortage in access to technology	Urban violence and insecurity
Gap between government and governed	Economy weaknesses and lack of competitiveness	Pollution	Climate change effects	Specific problems of urban youth	Rapid growth and Urban sprawl
Unbalanced geographical development	Specific problems of urban youth	Rapid growth	Pollution	Threats to cultural identity	Deficit of social services
Deficit of social services	Limited urban based industries		Rapid growth and Urban sprawl	Low educational level	Threats to cultural identity
	Unbalanced geographical development				Urban poverty and inequality

Poverty and urban insecurity are the other major challenges in this field. Living conditions in the South Mediterranean cities are less attractive than in the north Mediterranean ones, what in turn has effects on the loss of capacity to attract new businesses and talent. Government instability, in some cases high levels of violence and corruption and a high level of social and spatial polarization are common issues in

the south Mediterranean areas. Improving these social and living conditions establishes the foundations for building a better urban future.

Finally, one big drawback that a Smart City initiative in a southern Mediterranean city should carefully take into account is the smaller penetration of smartphones or ICT technology have on its population, comparing it to European countries. Due to the high levels of poverty, not a vast majority of the population living in these cities has access to the necessary technology to make certain Smart City initiatives available to all the citizens. Furthermore, there are also a great number of people who are technology-illiterate. Hence, making available and affordable the necessary technology and fostering educative programs so that the citizens will have knowledge and access to the needed ICT, will be another challenge to have in mind when planning a new initiative (Table 2).

4.3 Relation Between Challenges in European and in South and East Mediterranean Cities

The different Challenges in North and South interrelate, unfolding as cities progress in development and service provision to their inhabitants. When talking about Smart Cities or Smart City projects in the south Mediterranean areas it is necessary to take into account the differences between these cities and the north Mediterranean ones. A Smart City project should not follow the same strategies in one or another urban area because the challenges, starting conditions, available resources and citizens' willingness can be completely different (Fig. 2).

Becoming Smart in much of the south Mediterranean cities means providing some basic services they lack of. Furthermore, when facing these basic services provision it is necessary to look to the failures and needed improvements of the northern Mediterranean cities system. The South Mediterranean cities challenges may be more basic than the northern ones, but the transferability of the projects among cities should be useful for avoiding making the same mistakes twice. For example, many south Mediterranean cities have the necessity of dealing with the provision of an efficient public transport system, or others may be in a more basic stage and they just need to provide a public transport system. But when looking for solutions for the public transport, they should not just think about solving that specific problem but also on giving solutions to the transport system problems that will come afterwards, if they were to follow the same path as the Northern Mediterranean cities, such as the sustainability of the system, the non-car mobility, the inclusiveness of the transport system and the possibility of an effective multi-modal network.

All the relations have been summarized in one global graph that shows ASCI-MER's perspective on city issues. In this diagram the possible links among the southern Mediterranean cities challenges and the general city challenges have been suggested, so that when solving one of the southern challenges, solutions will take into account the other ones. The tangled challenges justify the need of a holistic approach in future cities, to correctly address important citizen's needs.

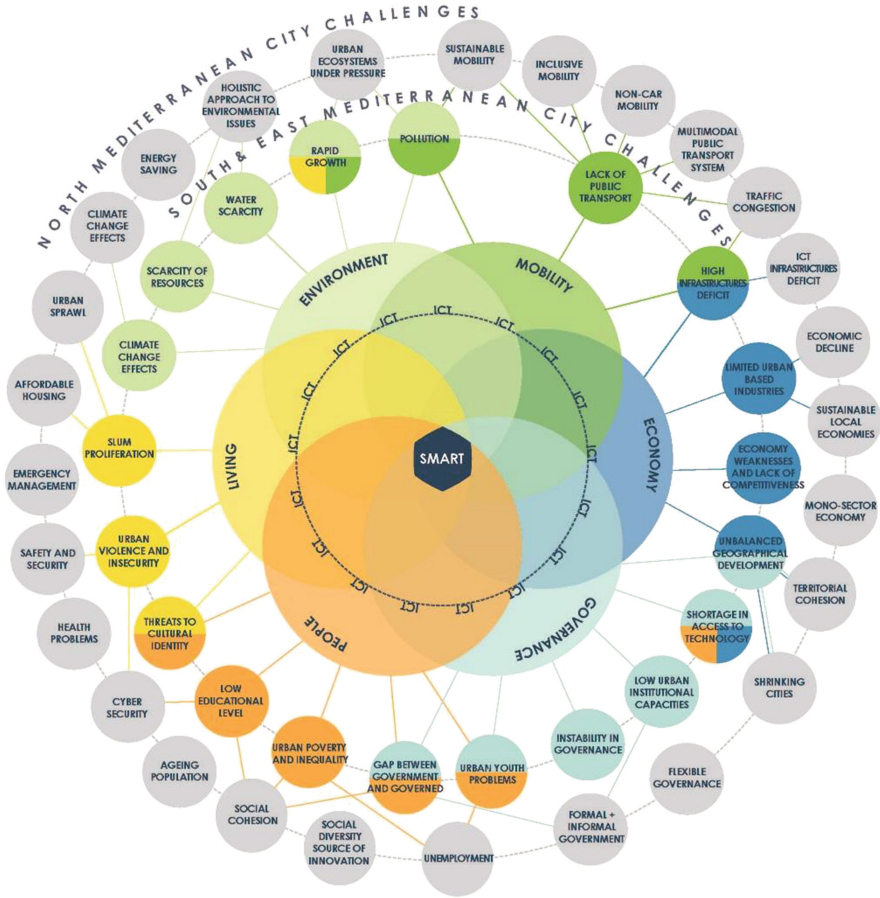This developed framework is used to give structure to the Projects Guide.

Fig. 2. Relations between Smart City Dimensions, South & East Mediterranean Challenges and general City Challenges.

5   Analysis of Smart City Projects

Different Smart City Projects have been analysed following the outputs of the previous study about the Smart City concept and the challenges cities must face. The analysis has been divided in two phases; firstly a conceptual framework has been developed in order to be used as an orientation through the possibilities of development of Smart City projects in the different dimensions already explained. Secondly, a deep description of a selected group of projects and cities specifying: what kind of Smart City Action the project belongs to and which are the related city dimensions that it comprises; what kind of city challenges they are trying to solve; and background information of the city where the project has been implemented. Besides, a brief explanation of the project itself has been developed including, when possible, the development rate and scale of the project; how it is financed; its key innovation features and its main impacts.

Table 3. Smart City project actions

Smart Governance		Smart Environment	
	Participation		Network and environmental monitoring
	Transparency and information accessibility		Energy efficiency
			Urban planning and urban refurbishment
	Public and Social Services		Smart buildings and building renovation
			Resources management
	Multi-level governance		Environmental protection
E Smart Economy	Innovation	**Smart People**	Digital education
	Entrepreneurship		Creativity
	Local & Global interconnectedness		ICT - Enabled working
	Productivity		Community building and urban life management
	Flexibility of labor market		Inclusive society
Smart Mobility	Traffic management	**Smart Living**	Tourism
	Public Transport		Culture and leisure
	ICT Infrastructure		Healthcare
	Logistics		Security
	Accessibility		Technology accessibility
	Clean, non-motorised options		Welfare & Social inclusion
	Multimodality		Public spaces management

The evolution of the concept of Smart City leads from specific projects to global city strategies through which it is possible to address city challenges at different levels (national, regional, international). Thus, it has been observed that it is necessary develop a strategy within city framework to articulate projects in different dimensions in order to achieve a holistic and comprehensive vision. Consequently, besides the analysis of isolated actions, some outstanding Mediterranean Strategies have been also identified and analysed. City balance in the 6 dimensions is crucial for the good performance. Without a global strategy, a city is in danger to perform some acupunctural projects that lead it to become imbalanced and thus, to the impacts of these projects being drastically reduced

All this information is gathered in a Projects Guide yet to be published. However, in this paper, only the outputs of the conceptual framework and the analysis of independent projects will be presented.

5.1   Smart City Project Actions

Once the concept of Smart City and the main challenges are defined, a systematic approach to the possibilities of action of the Smart City projects has been developed.

The Smart City concept has changed from the execution of specific projects to the implementation of global strategies to tackle city challenges. Thus, it is necessary to get a comprehensive overview of the possibilities and to relate them to the city challenges. As a common point to all of them, the key factor of the Smart City projects has been identified to be the use of ICT.

According to these criteria, project actions have been defined as seen in Table 3. The different Project Actions have been described and put into relation with the various city challenges identified in Part 1.

In a second step, Smart Projects that are being developed in cities have been grouped in the different dimensions. Smart City strategies comprehend a combination of these sub actions. Smart City Project Actions are also composed by more concrete subactions, that are further interwoven. The aim of this second phase is to widen the panel of possibilities of action and to present an approach that is closer to implementation.

Paying special attention to the environmental dimension, it stablishes the relations of the existing city with its territorial support, both natural and built. The relations of the city with its natural environment constitute the departure point for project actions that affect climate, biodiversity, resources (energy, water, etc.) and monitoring. The built environment is present in the project actions related to urban planning and building, either renewal or new construction. The challenges addressed in this dimension intertwine these two dimensions from the point of view of citizens.

5.2   Projects Guide

The Projects Guide is an information tool for cities that want to take advantage of the ICTs and solve their challenges through Smart City Projects.

The guide links city challenges with a wide range of Smart City projects designed to solve them. It is a tool for developing Smart Cities that efficiently respond to complex and diverse urban challenges without compromising their sustainable development and while improving the quality of life of their citizens.

This Projects Guide provides a series of matrices which serve as a tool for decision-making. These matrices relate city challenges with the specific actions designed to tackle them. Therefore, once specific city problems are identified, the guide provides information about the possible actions to take, as well as specific examples of on-going Smart City Projects that can respond to these challenges are this way localized.

The Guide is structured by Smart City Dimensions, with an initial map that shows the name and the location of the projects already found during the research.

Then a matrix shows how these projects are linked to both European and South-East Mediterranean challenges in each of the fields: Economy, Governance, Environment, Mobility, People and Living. Besides it also specifies to what kind of Smart City Action the project belongs and which are the related city dimensions that it comprises.

Table 4. Environmental Smart City projects and challenges. Part 1.

		Smart City Project Actions		
		SEn1. Network and environmental monitoring	SEn2. Energy efficiency	SEn3. Urban planning and urban refurbishment
European City Challenges	Energy saving	■	■	■
	Shrinking cities			■
	Holistic approach to environmental and energy issues	■	■	■
	Pollution	■	■	■
	Urban sprawl			■
South & East-Mediterranean City Challenges	Scarcity of resources	■	■	
	Water scarcity	■		
	Climate change effect	■	■	■
	Pollution and congestion	■	■	
	Very rapid urbanization			■
	Unbalanced geographical development			■
		PEn1a. Air Quality Monitoring Network. Amman, Jordan, Country	PEn2a. Watt et Moi. Lyon, France / PEn2b. Smart Grid. Malta.	PEn3a. Lyon Smart Community. Lyon, France
		PEn1b. Smart Water Metering. Kalgoorlie-Boulder, Australia	PEn2c. Renewable Energy & Energy efficiency law. Jordan	PEn3b. CASA neighbourhood, Casablanca, Morocco
		Smart City Projects		

The matrix that relates Environmental challenges with Projects and Projects actions in this fields shows a variety of connections. It comprehends 6 Project actions, each of them linked to at least 2 projects. Some of these types of project present a wider focus, being able to address almost every challenge in both North and South and East-Mediterranean regions. This is the case of Environmental protection projects (Table 5), that are related to most future city challenges. However, more specific projects, like the ones related to energy efficiency (Table 4), are not tackling so many challenges, but are fundamental to cities as urban agglomerations consume over 75 % of the world energy production [7].

Table 5. Environmental Smart City projects and challenges. Part 2.

		Smart City Project Actions		
		SEn4. Smart buildings and building renovation	SEn5. Resources management	SEn6. Environmental protection
European City Challenges	Energy saving	▓		
	Shrinking cities			
	Holistic approach to environmental and energy issues	▓	▓	▓
	Pollution	▓	▓	▓
	Urban sprawl			▓
South & East-Mediterranean City Challenges	Scarcity of resources		▓	▓
	Water scarcity		▓	▓
	Climate change effect		▓	▓
	Pollution and congestion	▓	▓	▓
	Very rapid urbanization	▓		▓
	Unbalanced geographical development		▓	▓
		PEn4a. Cityfied Project. Several, Several.	PEn5a. Jerusalem and Netanya water utilities, Israel	Pen5c. Recover Lost Water Revenue. Olds, Canada	PEn6a. Forest Fire detection. Valencia, Spain.
		PEn4b. Smart CoDe. Several, Several	PEn5b. LifeEWAS. Several, Several	PEn5b. Irriguest life. Victoria-Gasteiz, Spain	
			Smart City Projects		

Regarding the challenges, some of them must be tackled in a holistic approach and have the possibility to be addressed through many different projects like for example pollution and congestion or climate change effect, as cities generate 80 % of greenhouse gases emissions [7]. And of course, this holistic approach is properly a challenge, being necessary to address it through the combination of all the possible projects integrated through global city strategies.

It is important to highlight that every kind of project action is able to address challenges in the different areas of the region. The matrix includes both challenges of the North and South and East. Mediterranean region as the ASCIMER approach understands that the challenges of cities of the North can become future challenges for the cities in the South if they do not take them into account in this stage of their development.

Selected projects offer a variety of options, approaches and different impacts and results trying to cover the variety of issues that can be included in each of the identified project actions. Even if they can present different development degrees, projects of both the North and South and East-Mediterranean regions have been selected as examples, combining different approaches.

Therefore, a tool has been developed in which by selecting the main challenges that a particular city must face, it is possible to get as a result types of projects and specific examples that will help project designers and decision-makers to develop strategies to face present and future problems in the city.

Addressing environmental challenges should be combined with projects in other fields like economy, governance, mobility, people and living in order to develop Smart City Strategies to provide a comprehensive response to the needs of the city. The tool has therefore been developed in each of these different dimensions.

Thus, being part of the Smart City Strategy has been identified as a key element for a City Project to become Smart. For this reason, some of the most outstanding Mediterranean Smart City Strategies are presented to. This part of the guide will also be expanded through the complete ASCIMER project execution.

Finally the last section of the guide includes a preliminary study (already presented in the ASCIMER First Workshop in July 2014) on Smart Cities in the South Mediterranean Region. This short study aims at establishing the context for the development of Smart City actions in the region and also at describing common implementation problems as well as the main types of projects already implemented.

6 Conclusions

During this first year, ASCIMER project has been focused in the development of a conceptual framework for an assessment methodology for Smart City projects in the Mediterranean region. Understanding and classifying the action fields and existing Smart City projects have been the main outputs of the project this year.

Being a complex and multifaceted concept, several types of projects have been defined under this umbrella and thus it becomes necessary to select the main characteristics that a Smart city project must have. Smart city projects must be multidimensional and integrate the different action fields of the city, interacting with human and social capital. Technological solutions must be understood as the tool to achieve the smart city goals and to tackle the challenges cities must face. The main objectives of Smart City projects must be to solve urban problems in an efficient way to improve sustainability of the city and quality of life of its inhabitants. From the governance point of view, projects must be framed in a multi-stakeholder, municipally based partnership in order to provide complex and effective solutions.

Smart city projects main requirement must be addressing the real challenges that cities will face in the future. This is the first step that an assessment methodology must take into account. When analysing the Mediterranean region, it is key to understand the different challenges that cities in the European context and in the South and East-Mediterranean region must face and in which way they are related. Challenges that European cities are facing today can become future challenges in the south if their

present ones are not addressed including this vision. Smart city projects must tackle the problems of today's cities while also looking to the potential problems cities will face in the coming decades.

Assessment Methodologies are necessary for evaluating the real impact of Smart projects. Classifying existing solutions and projects is a main step for setting the aspects that a methodology must evaluate. These aspects must be related to the previously defined challenges, understanding in which way they provide a solution to the problems of the city. Providing examples in each of the fields, related to these Project Actions and challenges, results in a tool to develop solutions to city problems with a multidimensional and comprehensive approach.

Taking the findings about city challenges and project analysis of this first year, an assessment methodology will be developed in order to evaluate Smart City projects in the South and East Mediterranean Region. The development of indicators adapted to the main characteristics, projects and challenges of the cities of the Mediterranean region and the definition of the relation between them to develop a correct methodology will be the main goal of ASCIMER during the following year.

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