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SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS, INTERNET OF
THINGS AND SMART CITIES

ITU-T Y.4000 series – Smart sustainable cities – Master plan

ITU-T Y-series Recommendations – Supplement 33

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For further details, please refer to the list of ITU-T Recommendations.

Supplement 33 to ITU-T Y-series Recommendations

ITU-T Y.4000 series – Smart sustainable cities – Master plan

Summary

Supplement 33 to ITU-T Y-series Recommendations seeks to provide municipalities and interested stakeholders with a general overview of the stages and technical specifications that need to be considered to effectively apply the notion of the smart sustainable city (SSC) to their respective locations. It provides a guide for the implementation of SSC based on intensive use of information and communication technologies (ICTs), and refers the reader to a series of thematic reports that addresses the specific technical aspects involved in the design and operation of SSC strategies.

While building upon expertise available in the field, this Supplement is intended to be as general and inclusive as possible. It aims to inform the design of SSC strategies of any municipality, irrespective of its size, location or resource availability, in both developed and developing countries.

History

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FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Supplement 33 to ITU-T Y-series Recommendations

ITU-T Y.4000 series – Smart sustainable cities – Master plan

1 Scope

This Supplement seeks to provide municipalities and interested stakeholders with a general overview of the stages and technical specifications that need to be considered to effectively apply the notion of the smart sustainable city (SSC) to their respective locations. It provides a guide for the implementation of SSC based on intensive use of information and communication technologies (ICTs), and refers the reader to a series of thematic reports that addresses the specific technical aspects involved in the design and operation of SSC strategies.

While building upon expertise available in the field, this Supplement is intended to be as general and inclusive as possible. It aims to inform the design of SSC strategies of any municipality, irrespective of its size, location or resource availability, both in developed and developing countries.

2 Definitions

2.1 Terms defined elsewhere

This Supplement uses the following term defined elsewhere:

2.1.1 smart sustainable city [b-ITU-T Y.4900]: A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental, as well as cultural aspects.

NOTE – City competitiveness refers to policies, institutions, strategies and processes that determine the city's sustainable productivity.

3 Abbreviations and acronyms

This Supplement uses the following abbreviations and acronyms:

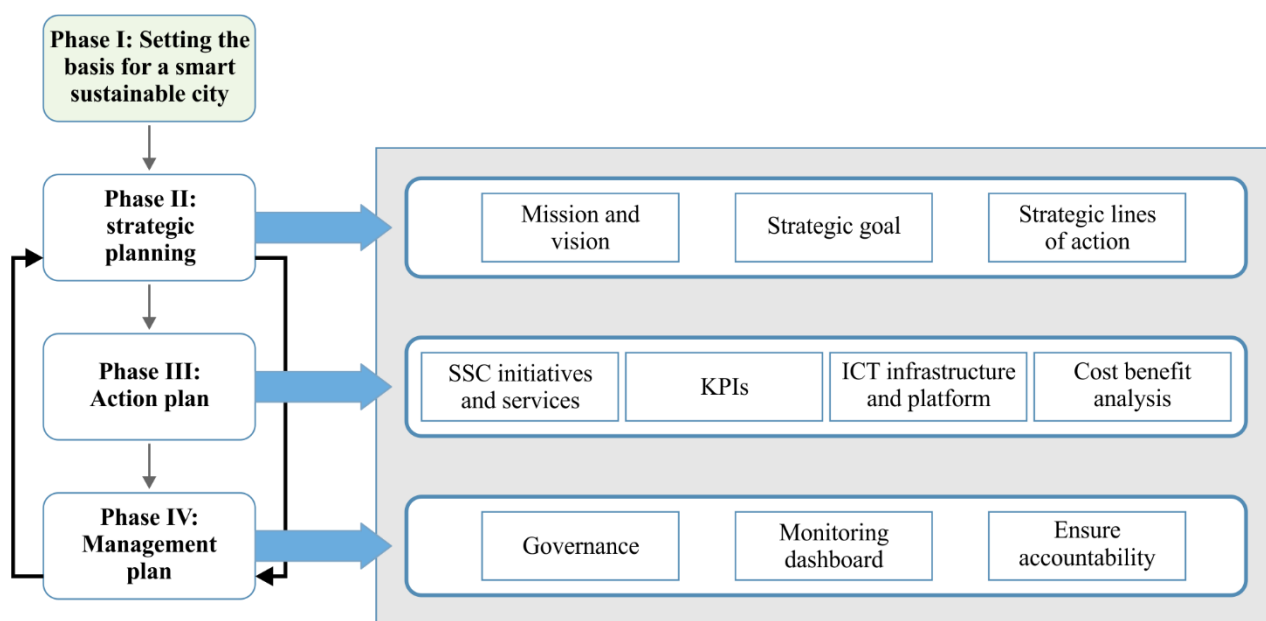
EMF	Electromagnetic Field
GPS	Global Positioning System
HART	Highway Addressable Remote Transmitter
ICT	Information and Communication Technology
KPI	Key Performance Indicator
M2M	Machine to Machine
NGO	Non-Governmental Organization
OAM&P	Operations, Administration, Maintenance and Provisioning
RFID	Radio Frequency Identifier
R&D	Research and Development
SCADA	Supervisory Control and Data Acquisition
SSC	Smart Sustainable City
Wi-Fi	Wireless Fidelity

4 Building a master plan: towards an integrated management in the smart sustainable city

Emerging experiences aimed at the design and realization of an SSC have shown that there is no single approach to make a municipality smarter and more sustainable. Each city constitutes a unique system, where different actors and city agencies, undertaking a range of activities, interact on multiple scales, using different facilities and infrastructures. Recognizing the particular environmental and societal contexts of the city, its purposes and priorities for action, as well as its history and characteristics, has become crucial not only to ensure effective governance, but also to determine the most appropriate path towards becoming smart and sustainable.

Local administrations need to: prepare municipal strategic plans as frameworks for the implementation of SSC initiatives; optimize urban services and tailor them towards citizens; move away from standardized and uniform service models to models that involve the provision of personalized services; develop transparent tariff systems that reflect the real cost of providing services to citizens; collect useful information about key performance indicators (KPIs); and develop integrated technological platforms that enable the management of intelligent cities.

The SSC master plan presented in Figure 1 provides an overview of the key components and stages involved in the process of building an integrated management scheme for an SSC.



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Figure 1 – Phases of action: Smart sustainable city master plan

4.1 Phase I: Setting the basis for a smart sustainable city

Cities that decide to become smart and sustainable have to start by determining their motivations and priorities, including the identification of the stakeholders that need to be involved, the implications of this transformation on the city's governance, as well as the mechanisms needed to ensure continuous citizen participation and feedback throughout the process (in the short, medium and long term, and across scales).

Setting the basis for an SSC consists largely of gaining a clear, yet in-depth, understanding of what it means to become an SSC and what the process would entail.

As stated in the preceding sections of the analysis, the concept of the SSC is extremely broad, and there are multiple and often competing approaches on how to achieve goals related to "smartness" and "sustainability" within urban settings. The concept of an SSC also varies significantly in different regions. For instance, Latin American SSC perspectives are strongly focused on the improvement of security, local government management and mobility, Asian SSC initiatives emphasize the importance of infrastructure and services provided to citizens in the context of growing urbanization, while European SSC approaches often concentrate on the improvement of the efficiency of public services to strengthen the well-being of citizens.

Seeking to address this lack of consensus in the understanding of SSC, ITU-T worked on the identification of a comprehensive definition of SSC presented in clause 2. This definition recognizes the pivotal role played by ICTs as enablers of sustainable and efficient city services.

Also involved in this first stage of implementation, is the definition of a baseline identifying the strengths and weaknesses of the city, and defining clearly the priorities and objectives, as the city moves towards the attainment of SSC status. This baseline must be defined in an empirical and standardized way through the use of indicators.

In this regard, it is important to recognize that for SSC strategies to succeed over time, they need to be well articulated and aligned with existent approaches to urban planning, so as to ensure that smart technologies, infrastructures and city services respond to a broader, more holistic vision of the city. Understanding the urban system, its goals, operation, gaps and opportunities, is a necessary step that should precede, and serve as a foundation for, the implementation of SSC strategies.

Identifying the city's projects and existing urban planning goals will help determine the priorities for action in path of the municipality towards becoming an SSC – i.e., the common solutions the city would want to implement first, and the areas of focus in the short, medium and long term.

Thus, the identification of city purposes and priorities for action, governance and stakeholders are closely interlinked, and are vital to form a robust basis for the design of an SSC. Along with the set of stakeholders and their roles and responsibilities within the SSC framework, decision-makers need to define a governance model and leadership strategies required for the city's transformation.

Thus, the establishment of a cross-sectorial body that can provide continuous support to city council officials and decision-makers could contribute to a coherent design and implementation of smart and sustainable cities over time. This body could: help ensure the articulation of SSC strategies and the city's urban planning goals; as well as facilitate collaboration and strategic alignment between the multiple stakeholders (including city-level departments and structures at local, municipal and national levels) that need to be involved in the realization of an SSC.

The ITU-T has developed a Supplement that identifies key SSC stakeholders [b-ITU-T Y-Sup.34].

A crucial step for setting an inclusive and sustainable basis for SSC consists of identifying and implementing effective mechanisms for citizen engagement. Citizens are the ultimate beneficiaries of SSC functionalities, as these are aimed at increasing the access to and boosting efficiency of city services, in order to improve citizens' well-being.

While these mechanisms should be set up at the onset of the SSC's strategy, they should be maintained, monitored and adjusted throughout the process of implementation to ensure flexibility, as well as the provision of up-to-date information about the features and benefits that SSC can provide to its citizens.

Without relevant and timely information, citizens can perceive SSC projects as an unnecessary use of their taxes. It is, therefore, important to demonstrate transparency and accountability in terms of the investments made in SSC service provision and the way in which these investments are having an impact on the citizens' quality of life.

An SSC needs to promote participation in crucial aspects of the city's functioning, like participatory budgets. The citizenry can also play a key role in the provision of data to inform city-level