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*Article*

# Smart City and Smart Economy: How Are the Greek Municipalities to Exploit the Smart City Benefits to Achieve Economic Development?

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**Abstract:** As digital technology has become an integral part of urban's daily operations; the urban landscape is constantly evolving with the needs of its society. This new reality allowed Municipalities to exert a higher influence in the national and local economy. Through deliberate planning and executing initiatives, they can ignite the local financial ecosystem to growth. In line with this, the paper aims to understand the possibilities available to the Greek Municipalities to exploit the smart city benefits to foster economic development. It is essential to understand the role of different factors including the strategy during the planning and implementing phases of initiatives concerning economy and innovation in a smart city. To achieve this, a tailor-made questionnaire and advanced statistical techniques are applied. The main findings highlight the importance to plan initiatives aligned with the needs of the municipality and the business environment. The existence of a smart city strategy has a catalytic effect on the final impact of the implemented initiatives on the urban environment. A systematic analysis of the smart cities' dynamics and the new state of the urban environment can help the local actors focus on the value creation and public service provision, fostering innovation and profitability.

**Keywords:** smart city ecosystem; urban economy; smart city; entrepreneurship; smart economy

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## 1. Introduction

### 1.1. The Need for a Smart Urban Environment

During the last decade, the citizens' needs, challenges and lifestyle have been diversifying, transforming and evolving the urban environment. Over the decades, the municipal authorities are faced with increasingly complex problems and challenges, extending to areas such as public transportation and services, health care, the environment, energy, and national, individual, and cyber security. During its transformation phase, resources gradually decreased, its management capacity undermined and the natural resource management mechanisms and action planning and decision-making reshaped [1,2].

Urbanization led progressively to the abandonment of rural areas and the accumulation of large numbers of residents in large urban centres. According to the United Nations research, currently the urban population exceeds 3 billion, accumulating over 70% of the world's population in megacities [3–8] and covering only 2% of the Earth's surface [9]. This affected the relationship of the citizen and public governance and stress the value of functions and processes aligned with the daily activities of organizations and habitants. The modern urban areas utilized information and communication technologies (ICT) as the appropriate tools for facing emerging challenges.

Advancements and cutting-edge technologies are encountered as a force for change, affecting economically, socially and politically all the components of an urban environment. Particularly, ICT ignited a technological revolution influencing all sectors of the global and urban economy [10,11],

responding to the emerging needs of urban habitants and significantly affecting the public governance at all levels of policy and management.

While the urban ecosystem is being "digitalized", the role of the municipality and its local authorities could not remain unaffected. The overall management of the services and the available human and financial capital concern horizontally all the sectors. Local Authorities can gradually support decentralized administration, activate citizens and save resources while providing integrated and rapid services. Traditionally, cities operational model is usually characterized by low connectivity and efficiency and the absence of the ability to carry out horizontal innovation between systems. This model is changing, and the upgraded operating model offers high accessibility and degree of interaction between the different sectors and participants [12]. Thus, the conditions formed lead to the creation of interactive channels, allowing the entry and promotion of innovation from multiple sources. It has acquired a more substantial and active role, leading to: (1) directly and indirectly effects of investments and quality of life, (2) formulation of partnerships and (3) variety of roles depending on its goals and strategy.

Today, a third generation of smart cities is emerging that tries to improve the aforementioned mismatch. Instead of an approach through technological providers (Smart City 1.0), or a model driven by the coexistence of technology and man in the city (Smart City 2.0), a new model of "co-creation" appears, in which society and citizens are co-creators (Smart City 3.0). In "smart city 3.0", the governance, regulations, policies, technological solutions and developments and society – citizens and organizations – interact, exchange data, and actively participate to improve urban initiatives and processes on a daily basis [13,14]. Now, the inhabitants play an essential role in the development and operation of the urban ecosystem while given the possibility to use open tools and methods for the overall management of the city.

According to the analysis of the literature, an urban ecosystem is distinguished in three main dimensions (1) technological, (2) institutional and (3) social human [15]. The impact of ICT in all these dimensions expanded on six main axes: (1) Smart economy, (2) smart mobility, (3) smart environment, (4) smart people, (5) smart living, and (6) smart governance [16,17]. Specifically, the field of smart economy can be studied at the global, national, regional or city level. At the urban level, the main structural feature is cities [18] and this is where the role of a smart city is emerging.

1.2. The Research Axis of the Paper

Consequently, the aim of the paper is to study the role of planning a strategy and implementing its actions relating to the economy and innovation in a smart city (**Error! Reference source not found.**). It tries to identify the impact of different factors during the design and execution of a strategy. The factors may relate to the needs of the society and the municipality.

The paper starts with the summary of the theory and the hypotheses supporting the purpose of the research. Then, the method and the dataset used are presented, followed by the results and their discussion. Finally, the paper concludes with the general output of the research.

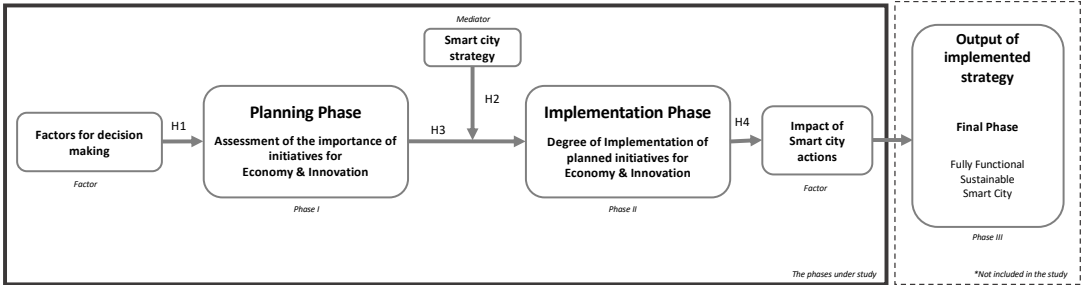


Figure 1. The hypothesized external structure of the proposed research model.

## 2. Theoretical Background and Hypotheses Development

The development of the urban ecosystem is accompanied by the upgrading of (1) urban infrastructure, (2) the daily functions of citizens, (3) the development of technologies and (4) the evolution of civilization [19]. However, for there to be substantial growth, the city needs to implement a sustainable strategy through the development of new technologies [19] and to shape a dynamic urban ecosystem, which encourages the collaboration of different organizations, policy makers, local governments and citizens [20]. The mechanism for creating business opportunities is multidimensional and complex with continuous interactions, supports the development of a supportive environment and encourages innovative entrepreneurship [21]. Therefore, the opportunity for companies and citizens to take risks, innovate, offer advanced solutions that are environmentally friendly, contribute to solving social problems and help create local employment opportunities [22–24].

At the same time, the use of modern technologies enabled the collection and distribution of data and knowledge to provide efficient and sustainable public services [20]. By allowing access to data, local governments encourage the formation of innovative businesses with social and economic value [25]. Given the potential, companies are investing huge resources in smart city initiatives, which promote innovative technologies, support the efficiency of Municipalities and create new business opportunities [26,27].

### 2.1. Innovation in Smart Cities

Innovation has a catalyst role in the development of a smart city. For an urban environment, innovation is the mechanism for economic development and digital transformation. Through innovation, local authorities and actors can deal with emerging urban problems [28]. By taking advantage of ICT developments, the implementation of plans, ideas and visions is achieved, while improving public functions and the quality of life [29].

Beyond the development and use of technology, innovation can revolutionize the applied policy and management practices to align with the city's needs [30]. Through innovation, an organization can adapt to market changes and technological developments, seize emerging opportunities and successfully endure financial problems, i.e., recessions [31]. However, the new conditions call on local authorities to differentiate themselves from their established practices and promote innovation in public actions [32–35]. Therefore, innovation retains an important role in the economic growth of an urban environment.

### 2.2. The Economy from the Smart City Point of View

An urban ecosystem can act as a driver for the development of innovation. Meanwhile, another economic factor, competitiveness, is inextricably linked to the development of the country and society [36]. Based on the literature, the future city's development is directly linked to the ICT funding. Technologies illustrate a catalytic impact for leading the digital transformation of the urban ecosystem and the economic development on a local, national and global level. Therefore, the integration of ICT in the economic activities of city's private and public entities transform the urban economy into a "smart economy". This transformation includes factors such as competitiveness, entrepreneurship, brands, innovation, productivity, market flexibility work and the integration of the activities of local organizations into the national and global market [37].

The smart economy is one of the key features of the smart city and is a central element of the economic, social and cultural development of the urban ecosystem [38]. It is directly linked to the national development. For the purposes of this paper, the smart economy treats ICTs as a driver of growth, which contribute to the characteristics of existing and new economic sectors of an urban area and is connected to characteristics relating to (1) attractive environment for setting up new businesses, (2) creating support mechanisms (i.e., incubators) an incubator for new businesses, (3) cooperative joint ventures, and (4) collaboration with university research groups. Therefore, the

smart city economy is considered "smart" and through competition, cooperation and clustering of economic units and activities stimulating innovation.

### 2.3. Factors Impacting the Decision-Making Process

As the global economy evolves and adapts to the technological progress and the evolution of society, smart economy is intertwined with the development of ICT and smart cities. During the industrial age the development of the economy was based more on the linear connections between industries, such as value chains, a company's physical assets, and metrics such as Gross Domestic Product (GDP). On the contrary, the digital age is characterized by networks or sets of sub-networks, fundamental to market rules and mechanisms [39]. Also, it is distinguished by specialization at individual level, adaptation to mass changes, horizontal exploitation of ICT, the constant exchange of information between different disciplines and actors and the creation of an environment to support innovative ideas [40].

Through ICT, new businesses are created with: (1) new innovative products, (2) possibility of working from home, (3) smart infrastructure, (4) better access to public documents, (5) improved connectivity of different organizations in public and private sector, (6) ability to work faster and more seamlessly and (7) products/services tailored to their customers' needs [40]. Therefore, local authorities try via the technological developments to solve critical challenges, to integrate heterogeneous Big Data, strengthen the cognitive level of employees, and increase the possibility of exploiting innovation. All of these, allowing organizations to solve emerging problems [40].

Therefore, during the planning of actions relating to enhancing the economy and innovation, a municipality needs to focus on the city's needs.

**H1:** *The city's needs impact positively and significantly the planning phase of a strategy focusing on the smart economy and innovation.*

### 2.4. Smart City Strategy

In the literature, there is a considerable interest in identifying various resources and factors (i.e., approaches, initiatives, projects, and policy aspects), to exploring and mapping the potentials of smart cities across different urban sectors [15,41,42]. Cities allocate diverse technological, financial, and human resources by implementing "smart" actions that prioritize the city's requirements leading to digital transformation [14]. Therefore, integrating technological advancements into policy and decision-making processes at an urban level is crucial [43]. The importance of this integration dwells from the significance of actions (e.g., project, strategy, or isolated actions) to comply with the city's urban planning and policy framework, thus emphasizing the importance of tailor-made strategies beneficial to the urban ecosystem [44]. Hence, a municipality needs a well-organized smart city strategy oriented on the economy and innovation in order to be able to execute initiatives focusing on creating an attractive environment for setting up new businesses, incubators or other support mechanisms for new businesses, supporting cooperative joint ventures, and helping form collaborations or urban actors with universities and research centres (H2).

**H2.** *The assessment of planning actions in a strategy relating to initiatives focusing on economy and innovation has a significant and positive effect on the degree of implementing relevant actions and projects.*

Formulating a smart sustainable city strategy requires policymakers to understand and consider the uncertainties of a municipality's social, financial, and cultural environment and the needs of all interested parties [41,45–47]. These strategies should gradually take into account the city's governance, economy, environmental issues, and stakeholder agendas and include initiatives which support innovation, investment and partnerships between different sectors and stakeholders [48,49].

Based on the finding from the literature, municipalities with a well-structured plan for their smart city projects are better positioned to carry out their anticipated initiatives. The impact is noteworthy particularly when the projects encompass e-government, e-services, city planning, education, finance, and resource management [14]. An analytical and structured framework can work as a guided roadmap for urban planners, enabling effective development of a smart city agenda



[50,51]. The value of a well-structured strategy is observed when its absence or lack creates significant obstacles to transforming an urban area into a smart one [52,53]. Therefore, crafting and implementing tailor-made strategies and personalized approaches in Greek municipalities can stimulate multiple factors that facilitate and support the community's smooth transition to the next era of digital transformation [14]. An even greater interest is located in the relationship between the existence of a well-organized plan and the implementation phase of anticipated smart city project focusing on the economy and innovation (H3).

**H3.** *The existence of a well-organized strategy affects indirectly positively and significantly the implementation phase of the anticipated smart city projects related to the economy and innovation.*

### 2.5. How Smart Cities Help the Urban Environment

Cities, as functional systems of physical objects and citizens, consume resources and services and offer economic, social, cultural and environmental services to satisfy the needs of their habitants [54]. The dynamics of cities have greatly permeated all aspects of society and greatly influenced the development of the economy [55]. They favour creativity, innovation and entrepreneurship and highlight the need to develop an entrepreneurial ecosystem, with an emphasis on the economy and entrepreneurial opportunities [68].

The economy based exclusively on the traditional form of industry is being transformed into a digital economy, i.e., the smart economy. The smart economy leverages ICT to stimulate innovation through competition, cooperation and clustering of economic units and activities. Everyone's role and ability to influence has changed dramatically. End-users have acquired an increased role; their views and society's values influence the decision-making process in both the private and public sectors. The demands of society and the ever-growing needs of cities have created a new reality.

A healthy digital business ecosystem is expected to deliver economic growth, environmental sustainability and social progress [54]. Subsequently, the city's business ecosystem contributes growth, sustainability and quality of life. Meanwhile, the continued upward trajectory of the ICT industry highlights the dynamics of digital transformation and its ability to generate multiply benefits for the economy and society [56]. The economic results of smart city initiatives affect the overall economic picture of a country through the formation of new start-ups, job creation, workforce development and the overall improvement of productivity, agencies and the country as a whole [37]. Therefore, it is important to study the benefits, such as efficiency, effectiveness, sustainability, and equality, of executing initiatives on relating to the smart economy (H4).

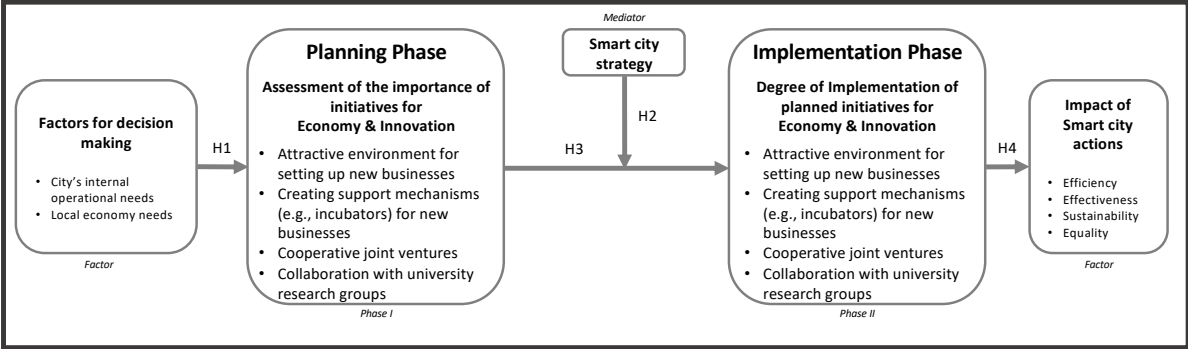
**H4:** *The implementation of actions relating to the economy and innovation in a smart city has a positive and significant impact on the creation benefiting the urban environment and creating value to the urban ecosystem.*

## 3. Data and Research Method

### 3.1. Research Framework

The formation of a smart city consists of three phases: phase I involves assessing the importance of smart city initiatives during the planning phase; phase II focuses on the implementation of planned initiatives; and phase III is the fully functional smart city or smart city 3.0. To form the conceptual framework, the paper focuses on the actions relating to the smart economy and innovation during the first two aforementioned phases, which set the foundations for a smart city. It examines the relationship between the assessment level of importance during the planning phase and the degree of implementation of initiatives relating to the economy and innovation. The factors assessing the impact of importance and degree of implementation are: (1) attractive environment for setting up new businesses (e.g., start-ups, spin-offs, spin-outs), (2) creating support mechanisms (i.e., incubators) for new businesses, (3) cooperative joint ventures, and (4) collaboration with teams from a university or research groups.

The hypotheses are based on the relationships and impact between the selected phases and their factors (Figure 2). They are evaluated through an empirical model, which includes factors for decision making, smart city strategy, and impact of smart city factors. The currently implemented smart city strategy is investigated to determine its influence amongst the phases I and II, as mediator. Complementary, the research takes into account the needs of the urban environment that impact the planning (phase I) and implementation phase of the initiatives (phase II), relating to enhancing the economy and innovation: (1) the city’s internal operational needs, and (2) the local economy needs.



**Figure 2.** The hypothesized internal structure of the proposed research model.

3.2. Data Specifications and Processing

Data originates from field research carried out from November 2018 to April 2019 via a structured questionnaire. It focused on three main aspects of a Greek municipality: (i) the technological and digital particularities, (ii) the features of a smart city strategy planned and implemented during the past years and (iii) the characteristics of the formulated partnerships with the city’s public authorities. The final sample corresponds to over 70% of the Greek municipalities and population [252 Municipalities across all 13 administrative regions of Greece (NUTS II level)]. The data and its characteristics are published in the Data in Brief [57].

Based on the proposed hypotheses and research model, the appropriate indicators were selected to form the suitable variables to measure and assess the research model and its main components. Therefore, the crucial factors that influence the strategic planning and implementation of smart city projects may be identified. Summarizing, all the measurement properties of the observed indicators and their constructs, including their description, the descriptive statistics [mean and standard deviation (S.D.)] and outer variance inflation factor (VIF)(max=5) [58], are presented in the Table 1. All the indicators are measured in a Likert scale from 1 (low) to 5 (max), apart from the smart city strategy, which is from 1 (no existing strategy) to 4 (complete strategy for smart cities). All indicators are grouped according to their conceptual relevance and validated through confirmatory factor analysis (CFA). Based on the nature of the model, all latent variables meeting the approved statistical criteria for inclusion are classified as reflective [59,60].

**Table 1.** The main characteristics of the variables (latent and observed)<sup>1</sup>.

Construct Name	Composition	Description	Mea n	S.D .	VI F <sup>2</sup>
Assessment of Importance [P]	Evaluate the importance of initiatives for economy and innovation which are directly planned to be implemented in the municipality and related to:		3.12	1.317	3.849
	[P] Attractive Environment	Attractive environment for setting up new businesses (e.g., start-ups, spin-offs, spin-outs)			

	[P] Support mechanisms	Creating support mechanisms (i.e., incubators) for new businesses	2.60	1.33 5	3.2 94
	[P] Joint Ventures	Cooperative joint ventures	2.96	1.28 2	3.1 43
	[P] Uni/Research Teams	Collaboration with teams from a university or research groups	2.89	1.27 7	2.5 63
Degree of Implementation [I]	Evaluate the importance of initiatives for economy and innovation which are being or are implemented in the municipality and related to:				
	[I] Attractive Environment	Attractive environment for setting up new businesses	2.30	1.09 9	2.3 36
	[I] Support mechanisms	Collaborative formations	1.87	1.07 5	2.3 93
	[I] Joint Ventures	Creating an incubator for new businesses	2.22	1.07 5	2.6 03
	[I] Uni/Research Teams	Collaboration with university research teams	2.27	1.10 4	1.8 94
Factors for decision making	Internal business needs	Functions related to its internal business needs	2.97	1.18 9	2.5 64
	Needs of local economy	Functions related to the needs of the local economy	2.90	1.19 3	2.5 64
Impact of smart city actions	Efficiency	Efficiency (e.g., increasing the productivity of municipal employees)	3.58	1.08 9	3.1 44
	Efficiency	Efficiency (e.g., production of more projects)	3.59	1.10 5	3.4 33
	Sustainability	Sustainability (e.g., existence of economic development in the region & development of new businesses)	3.52	1.11 6	2.6 05
	Equality	Equality (e.g., access of all citizens to all services)	3.65	1.11 9	2.4 37
Smart city strategy <sup>3</sup>	Smart city strategy	The level of extent in which a municipality has a digital strategy and a strategy of smart cities	1.67	1.09 7	1.0 00

<sup>1</sup> Results of the statistical test by 5000 iterations. <sup>2</sup>Full collinearity test of measurement model. <sup>3</sup>Single-item construct- Mediator.

### 3.3. Research Method

Based on the conceptual model and the data characteristics, the research method applied for investigating the variables' conceptual relationships is the Partial Least Square - Structural Equation Modelling (PLS-SEM), using the SmartPLS 4.0 [61]. This method is preferred for the prediction and theory development [59,62,63], in contrast to the other method the Covariance Based - Structural Equation Modelling (CB-SEM). The criteria of our choice are the nature of research and the characteristics of the data.



## 4. Model Verification and Results

### 4.1. Measurement Model Verification

The first step involves formulating the measurement model and evaluating the reliability and validity of the relationships between the observed variables and their corresponding latent variables [64]. The loading of each construct range from 0.811 to 0.946 ( $p < 0.001$ ). The criteria to evaluate the measurement model and test the construct reliability and validity of the four reflective latent variables are the Cronbach's Alpha (CA), the Dijkstra-Henseler's rho ( $\rho_A$ ), the Composite Reliability (CR) and Average Variance Extracted (AVE), with all having a lower threshold value of 0.700 (Table 2). All four criteria exceed the threshold values ensuring construct reliability and convergent validity [64–67]. Additionally, the constructs show a clear conceptual distinction, as the measurement model's discriminant validity is acceptable (higher threshold: criteria HTMT < 0.850) [68] (Table A1)(Appendix A).

**Table 2.** Results for the construct reliability and validity of the model<sup>1</sup>.

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Assessment of Importance [P]	0.921	0.921	0.944	0.808
Degree of Implementation [I]	0.879	0.885	0.917	0.735
Factors for decision making	0.877	0.878	0.942	0.890
Impact of smart city actions	0.910	0.938	0.936	0.785

<sup>1</sup>The single-item construct (Smart city strategy) is not presented as its value is equal to 1.000.

### 4.2. Structural Model Verification

After assessing the measurement model, we evaluated the structural model's ability to predict the concept under investigation [64]. The results are presented in Table 3. Our findings show the model's ability to predict the latent constructs [59] and no significant multicollinearity problems [69,70]. Additionally, the paper evaluated the mediating effect of the smart city strategy, as a factor that support the implementation of smart city initiatives relating to economy and innovation. To comprehend the impact of the mediation effect, we present the direct and indirect effects of the paths in Table A2 (Appendix A). Based on the analysis, the direct effects of the "Smart city strategy" are statistically significant for all its paths.

**Table 3.** The criteria of the main constructs (inner model).

Construct	R-squared adjusted	Effect size (f2) on "Degree of Implementation"	Inner VIF <sup>1</sup>
Assessment of Importance [P]	0.148	0.408	1.044
Degree of Implementation [I]	0.350	-	-
Factors for decision making	-	-	-
Impact of smart city actions	0.042	0.044	1.000
Smart city strategy	0.042	0.057	1.044

<sup>1</sup>Full collinearity test of structural model.

#### 4. Discussion

All the compulsory conditions are met for the structured models, thus resulting to the examination of the research's hypotheses (Table 4). According to the analysis conducted, all the initial hypotheses are confirmed.

**Table 4.** Summarizing the verification of the hypotheses of the paper.

Hypothesis	Path Coefficient ( $\beta$ - t-value p-value value)			Hypothesis status
<b>H1</b> The city's needs impact positively and significantly the planning phase of a strategy focusing on the smart economy and innovation.	0.398	6.944	0.000	Confirmed
<b>H2</b> The assessment of planning actions in a strategy relating to initiatives focusing on economy and innovation has a significant and positive effect on the degree of implementing relevant actions and projects.	0.524	10.900	0.000	Confirmed
<b>H3</b> The existence of a well-organized strategy affects indirectly positively and significantly the implementation phase of the anticipated smart city projects related to the economy and innovation.	0.040	2.425	0.015	Confirmed
<b>H4</b> The implementation of actions relating to the economy and innovation in a smart city has a positive and significant impact on the creation benefiting the urban environment and creating value to the urban ecosystem.	0.206	3.478	0.001	Confirmed

The findings in this paper are aligned with previous presented work, indicating that the existence of a smart city strategy can have a significant impact on implementing the relevant actions. Also, it is important to have a plan of initiatives that are aligned with the needs of the municipality and the business environment.

In this effort, the role of local government and stakeholders in planning, resources, financing and sustainability of actions is *important*. Finding and activating mechanisms, such as encouraging and engaging investors to create business initiatives and citizens to capitalize on and accept these initiatives, is a delicate balance to ensure economic and social sustainability. Their role is more important than it may seem. In that perspective, a supportive urban environment offers many business perspectives and cultivates an entrepreneurial spirit, both at individual and collective level.

Today, smart cities are presented as the solution for managing the urban phenomenon, waste, and resources. Despite their increasing growth, there is a climate of doubt about the intentions of business initiatives regarding technological development [71,72]. More specifically, although the smart city is about a commonly accepted fast-growing market, it is not clear how sustainable revenues and values are created. This discourages private sector entry without public support. However, since most cities are developed by public initiatives, the participation of the private sector with individual resources is an important factor. Therefore, a municipality needs to create the appropriate settings to help the private sector to take initiatives towards a more sustainable future.

At the same time, the role of the citizen has also changed, who acquires an active position and, as a driver of innovation, contributes to the creation of value [73]. The habitants needs to take initiatives and participate in the different projects taking place in their municipality.

Potential future directions would be useful to include other economic factors that impact the capabilities of a municipality, like population, GDP, registered public and private entities etc. Also, if this can be applied at a European level, could include more diverse types of cities and could set the foundations for a roadmap to assist local authorities to form a tailor-made strategy to their need. This can be helpful to the smaller cities to attract more habitants and investment.

In summary, the dynamics of smart cities, the smart economy and the possibilities of ICT are putting a constant pressure on organizations at all levels to change. Even though the focus of an organization is profit, the new state of the urban environment forces organizations to focus on the value creation and public service delivery. This approach can unlock previous barriers, focusing on the needs of organizations and customers, and displaying a capability to adapt to changes.

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**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

**Table A1.** Discriminant validity by HTMT and Pearson correlation<sup>1</sup>.

Constructs	1	2	3	4	5
1 Assessment of Importance [P]		0.564**	0.389**	0.250**	0.204**
2 Degree of Implementation [I]	0.625		0.393**	0.206**	0.303**
3 Factors for decision making	0.433	0.445		0.303**	0.450**
4 Impact of smart city actions	0.265	0.220	0.340		0.163**
5 Smart city strategy	0.213	0.322	0.481	0.171	

<sup>1</sup>Above the diagonal are the Pearson correlation between each construct and below are the HTMT values. The constructs are a result of the latent variables of the SmartPLS 4.0 program and have mean = 0 and S.D. = 1.

**Table A2.** Indirect and direct effect of the relationship of the variables (the t-values are shown in the parentheses).

No.	Relationships	Direct	Indirect
1	Assessment of Importance -> Degree of Implementation	0.524 (10.900)***	0.040 (2.425)**
2	Assessment of Importance -> Impact		0.116 (3.267)***
3	Assessment of Importance -> Smart city strategy	0.204 (3.702)***	
4	Decision Factors -> Assessment of Importance	0.389 (6.944)***	
5	Decision Factors -> Degree of Implementation		0.219 (5.342)***
6	Decision Factors -> Impact		0.045 (2.821)***
7	Decision Factors -> Smart city strategy		0.080 (2.751)***
8	Degree of Implementation -> Impact	0.206 (3.478)***	
9	Smart city strategy -> Degree of Implementation	0.196 (3.386)***	
10	Smart city strategy -> Impact		0.040 (2.195)**

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