Smart Cities as State Owned Enterprises with International Impact: Rhetoric or Reality?

Completed Research Paper

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Introduction

Governments worldwide have created several State Owned Enterprises (SOEs) in order to serve public functions, to capitalize national economic and natural resources of strategic interest or even to support economic growth (Dewenter and Malatesta 1997; U.S. General Accounting Office 1988). Various analyses (Andrés et al. 2011; Netter and Megginson 2001) depict that Governments encourage SOEs' privatization, especially for market linerization and for debt losses' control. Moreover, the same studies illustrate that the remaining SOEs deal with traditional economic activities and social services (European Commission 2004) or with resources' management of public interest (i.e., water and electricity supply, oil drilling and mineral mining, public transportation etc.).

Further to the above, States induct SOEs for new markets' creation since it holds the power to support national and regional economic growth via framework programs and public projects. In Brazil (Trebat 1983) and Greece (Lioukas et al. 1993) for instance, SOEs have initiated alternative energy production and/or telecommunication markets, while in Post-Soviet States (Bilsen and Konings 1998) and China (Mako and Zhang 2003) SOEs have developed and controlled the entire market before or until their transition. In this context, public investments migrate to private control by their planning (in Public Private Partnerships (PPP)) or after they close their initial life-cycles.

The topic of this paper concerns the Smart Cities, which describe the application of the Information and Communications Technologies (ICT) and the deployment of various e-services in urban areas (Anthopoulos and Vakali 2012). Smart cities suggest a crucial topic because, they deal with important state-of-the-art notions i.e., e-Government service delivery, e-service adoption, social aspects and social networking, wide areas of practice for technological evolution etc. More specifically, this paper addresses the preferred organization structure of Smart Cities and tries to answer the following two research questions: "*is the preferred organization structure of Smart Cities SOE?*" and "*is the Smart City SOE a vehicle for international expansion, national trading and competition?*"

These two questions are very important to be answered for both the domains of Smart Cities and SOEs because, they request the determination of the organizational structures and the business models that Smart Cities adopt in order to sustain and compete in the international arena. In case that the preferred organizational structure will be confirmed to be a SOE, new areas for scientific study rise: Smart Cities beyond their technological interest comprise an extensive and emerging market accounting more than U.S. $240 billion (Korea IT Times 2012), while they've become living labs and means that attract investments and sell products and expertise.

The first research question could be considered as simple and trivial, since the Smart Cities are the result of public investments (programmes or projects), which are developed for relevant to Government Owned Enterprises' specific purposes -such as to assert economic growth- and belong to the State or to a Municipality until their potential privatization after the close of their initial life-cycles. The deliverables of these interventions are controlled by organizations, which either exist (i.e., Municipalities) or they are legally grounded for the purposes of each case. Smart Cities that are publicly funded and municipally managed can be considered SOEs, since many locally administered SOEs exist (Mako and Zhang 2003) and enjoy "localization of benefits" (i.e., wages). A known Smart City SOE is Kingston Communications (www.kc.co.uk), which operates under the municipality of Hull (UK). Kingston Communications offers

telecommunication services on behalf of the Smart City of Hull, while it represents a business model of selling telecommunication services. However, no particular study has been performed so far that considers Smart Cities from the SOE perspective or classifies Smart Cities or demonstrate their organization and business cases.

The second research question is more challenging and rises from the cases of New Songdo (South Korea) and Dubai (United Arab Emirates). New Songdo ubiquitous city has been evolved as a coalition of international interests and its viability mostly depends on foreigners' residential and on real estate capitalization (Lee and Oh, 2008). Dubai Internet City (www.dubaiinternetcity.com) on the other hand, has become a business park for flourish investments based on the ICT, which attracts and invites international firms to locate and perform their business processes. These two different cases alone demonstrate the potential globalization role of a Smart City, which is extended beyond the State borders.

The remaining of this paper is organized as follows: in the following background section 2, the Smart City analysis and classification according literature review is performed. In section 3, the research methodology is explained and presented. In section 4, this paper's research questions are discussed according to the extracted outcomes. Finally, in section 5 some conclusions and some future thoughts are given.

Background

According to (Giffinger et al. 2007; Chourabi et al. 2012) the term Smart City is not used in a holistic way describing a city with certain attributes, but is used for various aspects which range from mesh metropolitan ICT environments to a city regarding the education (or smartness) of its inhabitants (Giffinger et al. 2007, Komninos 2002). The Smart City was originally introduced in the Australian cases of Brisbane and Blacksbourg (Anthopoulos and Vakali 2012) where the ICT supported the social participation and the social cohesion with the narrowness of the digital divide, together with the availability of public information and services. The Smart City was later evolved to (a) an urban space for business opportunities, which was followed by the network of Malta, Dubai and Kochi (www.smartcity.ae); and to (b) ubiquitous technologies installed across the city, which are integrated into everyday objects and activities.

Moreover, Smart City has been approached as part of the broader term of digital city by (Anthopoulos and Tsoukalas 2006), where a generic multi-tier common architecture for digital cities was introduced, and assigned Smart City to the software and services layer of this architecture. For the purposes of this article, the term Smart City will refer to all alternative approaches to metropolitan ICT cases. In the following paragraphs an analysis over various important Smart Cities is presented, outlining their mission, their business case and their organizational structure.

An initial attempt to Smart City classification followed literature review across ICT and economic journals, books and conferences. Journals such as the Communications of the ACM, International Journal of Electronic Government Research, New Media & Technology, Public Administration Review, Journal of Urban Technology, Environment and Planning B and Journal of e-Government have hosted several articles regarding Smart City since 1998; International Conferences from 2001 that have been organized under IEEE -such as the Hawaii International Conference on System Sciences, Info-tech and Info-day and PICMET- and IARIA responsibilities also demonstrate important relevant work; Various scientific books that have been published by prestigious publishers such as Springer and Routledge contain alternative approaches to the Smart City domain, such as technological aspects, social issues, financial and managerial perspectives etc. Finally, postgraduate dissertations and PhD thesis have been developed in the Smart City domain and they return useful findings with regard to Smart City and Urban Development (Lee and Oh 2008; Wang and Wu 2001).

This literature review returned thirty four (34) different Smart City cases that have been appeared since the early 90s, together with eight (8) different Smart City categories. This classification expresses the Smart City mission, which together with the representatives for each category comprise columns 1 and 2 of (Figure 1):

- Web or Virtual Cities (Ishida 2002; Ishida et al. 2010; Lieshout 2001) offer local information, online chatting and meeting rooms, and city augmented reality navigation via the Web. America-On-Line

(AOL) Cities (1997), Kyoto, Japan (1996-2001), Bristol, U.S.A. (1997) and Amsterdam (1997) were the initial representatives of this category.

- Knowledge Bases (Van Bastelaer 1998) are public databases with crowd sourcing options accessible via the Internet and via text-TV. Three representatives have been identified: Copenhagen Base (1989), Craigmillar Community Information Service, Scotland (1994), Blacksburg Knowledge Democracy,
- Broadband City/Broadband Metropolis (Sairamesh et al. 2004; Townsend 2007; Van Bastelaer 1998) describe fiber optic backbones were installed in the urban area, which enable the interconnection of households and of local enterprises to ultra-high speed networks. Seoul, S. Korea (1997), Beijing, China (1999), Helsinki (1995), Geneva-MAN, Switzerland (1995), and Antwerp comprised this category.
- Mobile/Ambient Cities (Ganapati and Schoepp 2008) are metropolitan wireless broadband networks accessible across the city or in some neighbors. Initial representatives of this group still exist today, while this approach has many similarities to the Broadband City approach. New York City (1994), Kista Science City / Stockholm (2002) and Florence, Italy (2006) were the identified representative members.
- The Smart City approach offers broadband and media infrastructures for business development. Several dimensions of intelligence to which the ICT can contribute are recongnized: economy (Smart Economy), education (Smart People), governance (Smart Governance), transportation (Smart Mobility), sustainability (Smart Environment) and everyday life (Smart Living). Taipei, Taiwan (2004), Tianjin, China (2007), Barcelona, Spain (2000), Brisbane, Australia (2004), Malta (2007), Kochi, India (2007) and Dubai (1999- today) are the identified representatives.
- The Digital City (Anthopoulos and Tsoukalas 2006; Moon, 2002) describes a "mesh" metropolitan environment that interconnects virtual and physical spaces in order to deal with: a) local needs and transactions, b) the transformation of the local community to a local information society, c) sustainable local development. Hull, U.K. (2000), Cape Town, South Africa (2000), Trikala, Greece (2003), Tampere, Finland (2003), Knowledge Based Cities, Portugal (1995), and Austin, U.S.A. (1995- today) comprise this group.
- The Ubiquitous City concerns a next generation urban space that includes an integrated set of ubiquitous services (Kwon and Kim, 2007). This approach is accompanied with the construction of new urban spaces where the pervasive computing will be included from the scratch in buildings. New Sondgo, S. Korea (2008), Dongtan, S. Korea (2005), Osaka, Japan (2008), Manhattan Harbour, Kentucky, U.S.A. (2010), Masdar, United Arab Emirates (2008) and Helsinki Arabianranta, Finland (2005) are the identified ubiquitous cities.
- Finally, the Eco City (Wang and Wu 2002) suggests the most popular approach, to which many of the previously presented cases have evolved. This Smart City approach capitalizes the ICT for sustainable growth and for environmental protection.

Except from the above approaches, various cities joined networks of common interests to provide with intelligence their urban spaces or to structure virtual teams of collaborative people. The Eurocities network (http://www.eurocities.org), the Intelligent Communities (www.intelligentcommunity.org), the World Foundation of Smart Communities (http://www.smartcommunities.org) and the Community Networks (e.g. the Seattle Community Network (http://www.scn.org)) are such representative cases. Membership and Social networks are the business models that lie behind this Smart City approach.

Category	Representatives found in literature and the year of their appearance	Outcomes from further investigation of the identified cases
Web/Virtual City	1. **America-On-Line (AOL) Cities** (1997) 2. **Kyoto**, Japan (1996-2001) http://www.digitalcity.gr.jp 3. **Bristol, U.S.A.** (1997) 4. **Amsterdam** (1997)	1. **America-On-Line (AOL) Cities** (Private Company) City Guides for U.S. cities http://www.citysbest.com 3. **Bristol, U.S.A.** (Municipality appointed the Project to a Private Company) http://www.digitalbristol.org/ 6. **Craigmillar Community Information Service** Scotland . (Municipal Service) http://www.s1craigmillar.com
Knowledge Bases	5. **Copenhagen Base** (1989) 6. **Craigmillar Community Information Service,** Scotland (1994) 7. **Blacksburg Knowledge Democracy**, U.S.A. (1994)	
Broadband City / Broadband Metropolis	8. **Seoul**, S. Korea (1997) 9. **Beijing**, China (1999) 10. **Helsinki** (1995) 11. **Geneva-MAN**, Switzerland (1995) 12. **Antwerp**, Belgium (1995)	11. **Geneva-MAN**, Switzerland It began as a public investment, which by 2003 assigned the extension and operation to a Private Company, while the State keeps the control (possible SOE)
Wireless / Mobile City	13. **New York** (1994) 14. **Kista Science City / Stockholm** (2002) 15. **Florence,** Italy (2006)	13. **New York** It operates under the New York City Department of Information Technology & Telecommunications (DoITT) (SOE) http://www.nyc.gov/html/doitt/ 14. **Kista Science City/ Stockholm** ICT partnership between companies and the Municipality (possible SOE) http://en.kista.com 15. **Florence,** Italy It operates under the Municipality (possible SOE). http://senseable.mit.edu/florence/
Smart City	16. **Taipei**, Taiwan (2004) 17. **Tianjin**, China (2007) 18. **Barcelona**, Spain (2000) 19. **Brisbane**, Australia (2004) 20. **Malta** (2007) 21. **Dubai** (1999- today) 22. **Kochi,** India (2007)	10. **Helsinki** It has been evolved from a Wireless City, it is funded by European Framework Programs and encourages privatization (possible SOE) http://www.hel.fi 12. **Antwerp**, Belgium Evolved from Broadband City; it is interconnected to Brussels and to Amsterdam (Baeyens, 2008); offers its infrastructure with the open access business model; it operates under the Municipality and invites private investments (possible SOE). 19. **Brisbane**, Australia Exists and limited its scope to local e-Government, traffic and parking services, and on waste management. It operates under the Municipality (possible SOE). http://www.brisbane.qld.gov.au 20. **Malta** Continues to connect ICT companies especially in the field of healthcare and education. Self-sustained township, is the result of a private investment http://malta.smartcity.ae/ 21. **Dubai** Exists and continues to integrate top ICT solutions It is the result of a private investment www.dubaiinternetcity.com www.dubaimediacity.com 22. **Kochi**, India Self-sustained township, is the result of a private investment, State Government of Kerala, India. http://www.smartcity.ae
Digital City	23. **Hull**, U.K. (2000) 24. **Cape Town,** South Africa (2000) 25. **Trikala**, Greece (2003) 26. **Tampere**, Finland (2003) 27. **Knowledge Based Cities**, Portugal (1995) 28. **Austin**, U.S.A. (1995- today)	9. **Beijing**, China It evolved from a broadband city (Qi & Shaofu, 2001) Alliance between the Municipality and a private company (possible SOE). 7. **Blacksburg Electronic Village**, U.S.A. It updated its mission and evolved from a knowledge base, it serves local community and operates with the partnership between Municipality, the local university and a private operator (Carroll, 2005) (possible SOE) http://www.bev.net/ 23. **Hull**, U.K. Exists and focuses on e-Government, on e-learning and on smart TV It is funded by European Framework Programs; offers its infrastructure with the open access business model; it operates under the Municipality and encourages privatization (possible SOE) http://www.hullcc.gov.uk 24. **Cape Town,** South Africa Exists and offers various e-services such as environmental, for

Figure 1. A bibliographic Smart City classification

Research Methodology

In an attempt to answer the above questions, the identified 34 Smart Cities have been analyzed further regarding their recent conditions and their business models. Further investigation was performed with the following process: a) crawling for the cases' official websites; b) studying their recent condition regarding its existence and mission; c) identification of their organization structure from the "About" section and of their official publications; d) determination of the services that the Smart City offers; e) conclusion upon an existing business model or assignment of a business model according to the description on the official websites.

This process resulted in a "deeper" investigation, which showed that the previously presented cases are not the only ones that appear in the Smart City domain. However, the presented sample is international and efficient to return useful results regarding this paper's research questions. Moreover, Smart City coalitions have been generated (i.e., http://smartcities.info/), events are organized frequently (Schaffers and Komninos 2012) and that various research projects are being developed in this domain (European Commission, 2012). Finally, various companies have been activated in the Smart City domain (i.e., Alcatel – Lucent 2012) and have developed special technologic solutions.

The outcomes from this investigation were combined with empirical findings and with findings from unstructured interviews with the supervisors of two cases (Tampere, Finland and Trikala, Greece). This methodology concludes that the Smart City domain is dynamic and various cases have updated their missions and changed their classification group (column 3, Table 1). Moreover, the organization structure of the examined cases was recognized and it is presented on the third column of (Table 1). The outcomes of this process answered the first research question.

Furthermore, authors used findings from two particular cases that are presented on (Tables 1, 2 and 3): a) Smart City of Tampere (Finland), where they performed an interview with the supervisor; b) Smart City of Trikala (Greece), from which they hold empirical findings. Regarding the Tampere case, an unstructured interview was performed on April, 2012. The interview contained relevant questions such as "how did the case start?"; "which is the case's mission?"; "how is your organization structured?"; "what is your business model(s) that secures your sustainability?". The responses from this interview defined that the Smart City of Tampere project has been and it is being funded with European and National public programmes. The project is run under the coalition of Municipality of Tampere and Tampere University, while none of them keeps interests on the deliverables nor a particular organization has been structured. Instead, companies that implement Smart City infrastructure and Services have to keep them maintained and updated. Moreover, more than 1,000 freelancers are occupied for the purposes of the Smart City and develop innovative ideas that become innovative products for export. Tampere has focused on Eco City challenges but they have not yet completed this transition. Finally, Tampere shared its know-how with Helsinki and Finnish central Government.

On the other hand, the case of the Smart City of Trikala (Greece) has followed a different approach. This case has been funded by European and National public programmes too; it has been implemented under the supervision of the Municipality of Trikala, while a SOE has been structured to manage the project and its deliverables. The Municipality and the local Chamber share interests on the Smart City and they are represented in the SEO respectively. The owned infrastructure is public and open to use by any provider that meets some criteria. Thus, Trikala case tries to secure its sustainability via selling their gained know-how to other cities.

The identification of the business models of the examined cases was a complex procedure. Some official findings (Table 2) were identified regarding the Openness of the Commercial Enterprise and ICT network ownership (Alcatel-Lucent, 2012), which concerns the ownership of the Smart City's infrastructure. This method is challenging, since it determines business cases for the future cities too (i.e., Grants for smart grids and Pay-Per-Light in the Eco Cities). However, this procedure cannot be used by Web/Virtual Smart Cities since in this case infrastructure is not considered and it consists of four (4) business models (Alcatel-Lucent 2012):

- Private: A developer independently builds a network to deliver services and undertakes network operations and maintenance.
- Exclusive: A developer chooses a provider to construct an ICT network and provide services. Only the chosen provider has the right to operate within the designated area.
- Managed: A developer appoints a provider to construct the only network in a specified area and this provider has exclusive rights for network operation and maintenance. All qualified providers can deliver services through this network.
- Open: Similar to operations within a public area, all qualified providers can construct a network and provide services in the area, and subscribers can choose any network and service.

Table 2. Openness of the Commercial Enterprise and ICT network ownership business models

Business Model	**Applicable to**
Open (Public Network)	Bristol, U.S.A. / Amsterdam / Cape Town, South Africa / Helsinki / Antwerp, Belgium
Private (Independent Private Developer)	Malta / Dubai / New Songdo / Taipei, Taiwan / Tianjin, China / Dongtan, S. Korea / Osaka, Japan / Austin, U.S.A. / Manhattan Harbour, / Kentucky, U.S.A. / Masdar, United Arab Emirates
Exclusive (Selected Provider)	Seoul, S. Korea / Beijing, China / Helsinki Arabianranta, Finland / Blacksburg Electronic Village, Australia /
Managed (Appointed Provider)	Geneva-MAN, Switzerland / Trikala, Greece / Barcelona, Spain / Brisbane, Australia Tampere, Finland / Hull, U.K. / Knowledge Based Cities, Portugal
Not Applicable	America-On-Line (AOL) Cities / Kyoto, Japan Copenhagen Base / Craigmillar Community / Information Service, Scotland

Nevertheless, for the remaining of the examined cases their business model was unclear. For these cases we used business models regarding E-commerce business models (Turban 2002) and assigned them to each examined case, according to the provided Smart City services. This second process has limitations since it has to be confirmed in a further study, but it provides with useful information concerning Smart City business role in the international market. From the eighteen (18) available e-commerce business models, the ones that have been considered applicable concern (Turban 2002):

- Social Networks, Communities and blogs: service provision via social media, communities and blogs.
- Membership: traditional model that offers services only to registered members.
- Affiliate marketing: online advertisements.
- Value Chain integration: it concerns relative service identification and provision, together with a service.
- Group purchasing: vast sales/buying that offer better prices.
- Tendering / reverse auctioning: earnings come as wages over the agreed selling/buying price that is being obtained via tendering/reverse auctioning services.
- Customization: custom e-service offering according to buyer's profile.

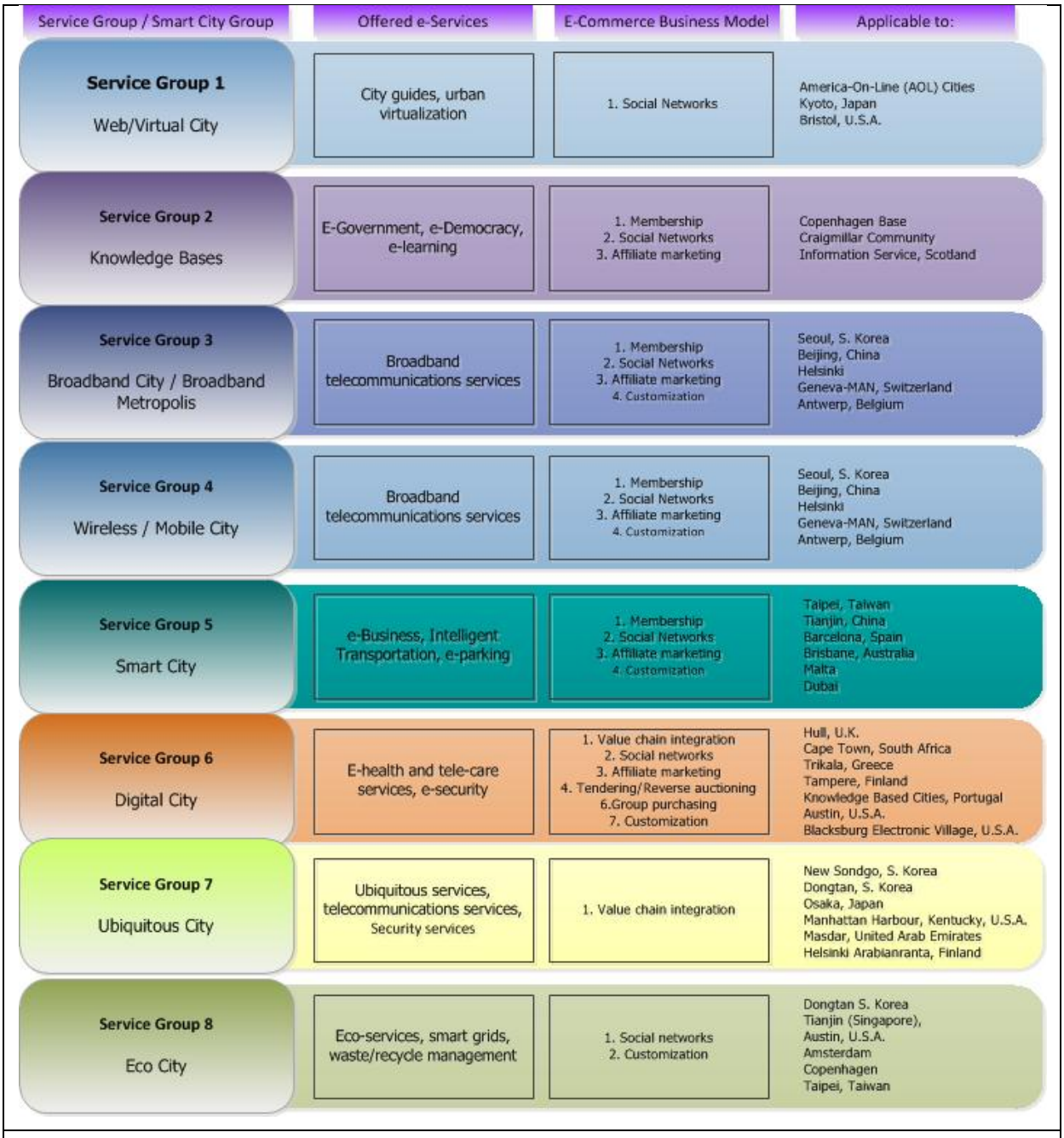

Figure 2. E-commerce business model according to the offered e-services

Findings And Discussion

The applied research methodology showed that the Smart City domain is emerging. The sample that was retrieved from the literature concerns only some of the existing Smart Cities. For instance, in Korea alone, 20 ubiquitous cities beyond the mentioned ones are under development (Korean Ministry of Information and Communications, 2007). However, the examined sample is international and efficient to return useful outcomes regarding this paper's research questions.

Moreover, our methodology showed that the Smart City domain is dynamic. Fourteen (14) of the examined cases updated their mission and the offered e-services and they changed category:

- Digital City of Kyoto ended it mission by 2001.
- Amsterdam that has been funded by European framework programmes and operates under the Municipality, evolved to other approaches (broadband, smart, eco-city). This case encourages private investments and it is a possible SOE.
- Antwerp, Belgium evolved from a Broadband City to a Smart City and it is a possible SOE. It is interconnected to Brussels and to Amsterdam (Baeyens 2008); it offers its infrastructure with the open access business model, while it operates under the Municipality and invites private investments.
- Austin, U.S.A. began as a digital city and emerged to Eco City. Municipality assigned its operation to a private company. I
- Barcelona evolved from a Smart City to an Eco City. It can be considered a possible SOE since it has been funded by European framework programmes and by public budget and operates under the Municipality, while it encourages private investments.
- Blacksbourg Knowledge Democracy updated its mission and evolved from a knowledge base to a digital city. It serves the local community as a possible SOE since it operates with the partnership between Municipality, the local university and a private operator (Carroll 2005).
- Beijing has evolved from a broadband city (Qi and Shaofu, 2001) to a digital city. Its organization concerns an alliance between the Municipality and a private company, which suggest a possible SOE.
- Copenhagen has evolved from a knowledge base to an Eco City. It has been funded by European framework programmes and operates under the Municipality, which encourages private investments, suggesting a possible SOE.
- Craigmillar Community Information Service has been updated from a knowledge base to a web/virtual city and became a Municipal service that does not suggest a SOE.
- Dongtan (S. Korea) has emerged from a ubiquitous city to an Eco City and operates under the consortium of public and private stakeholders that comprise a possible SOE.
- Helsinki has evolved from a Wireless City to a Smart City, while it has been funded by European Framework Programs and encourages privatization. Its organization can be concerned a possible SOE.
- Masdar (United Arab Emirates) has evolved from a ubiquitous city to an Eco City. It is still under development and it is publicly funded suggesting a possible SOE.
- Seoul evolved from a broadband city to a Ubiquitous city and operates under a coalition of public and private stakeholders, which can be considered as a possible SOE (Korean Ministry of Information and Communications, 2007).
- Taipei has evolved from a Smart City to an Eco City. It is a possible SOE since it has been funded by public budget and invites private partnership.

Beyond the above findings, literature review and research methodology illustrate that most of the examined cases are funded by public budgets. All the European cases have been initiated by local Governments, while central initiatives try to develop networks of Smart Cities. All these publicly funded Smart Cities can be considered SOEs since they offer public e-services or goods of common wealth to the local community (i.e., telecommunication services, mass intelligent transportation etc.) like the traditional locally administered SOEs. Exceptions are: (a) Craigmillar virtual city and Portugal Knowledge Based Cities that have been incorporated as services to the respective Municipalities; (b) Tampere (Finland) Digital City where the participant stakeholders (the Municipality, the local university and the private investors) keep their individual interests on the Smart City without structuring a new organization.

Moreover, some of the examined publicly funded Smart Cities can be confirmed to be SOEs: e-Trikala where a coalition between the Municipality and the local chamber developed a SOE; New York mobile city that operates under the DoITT; New Songdo and the other Korean ubiquitous cities where the project consortiums become SOEs.

Some additional important outcomes concern the particular business models, on which the Smart Cities are based. Some of the examined cases operate according to the ICT network ownership model (Alcatel-Lucent 2012). This business model has clearly been adopted by many of the examined cases (Geneva MAN, Antwerp, Knowledge Based Cities, Beijing, e-Trikala, Hull etc.). Nevertheless, most of the examined cases have publicly funded their infrastructure as well as many of the delivered e-services too and the local Government is obliged to maintain them (i.e., e-Trikala, Hull, Florence wireless city, Amsterdam etc.). In these cases, local Governments choose e-commerce business models for the provided e-services (Turban 2002) and sustain due to the income they gain from the e-service grants.

As a result, the preferred organization structure of the Smart City is the SOE, since some Smart Cities are proved to be SOEs, while many others can be considered SOEs but it remains to be confirmed by a future research. The organization structure's analysis of a Smart City is important since the Smart City does not simply concern a project but it results to an organization that operates the deliverables of the project. Business model is an important aspect of a Smart City since it secures its incomes and sustainability, while it illustrates enough information regarding its organization structure.

From the Smart City SOEs, many have to play international roles and support central Government's global mission. For instance, the Korean ubiquitous cities have established both to attract international funding and to export their expertise and business cases to other countries (i.e., Central and South America) (Korean Ministry of Information and Communications 2007; Korea IT Times 2012). This Korean know-how concerns a national "innovative product", which has been developed with international funding and it is being exported to other countries. Koreans recognize Smart City as a new industry amounting more than U.S. $240 billion and consider city competition as nation competition.

Furthermore, the case of Masdar (UAE) uses the public funding to attract international businesses and to import investments that will contribute to the national capital and to local growth. Similar business cases are the Smart Cities of Dubai, Kochi and Malta, where private capital establishes the national political vision of attracting international investments and support local growth. Furthermore, the brand new – built from scratch- Korean cities (New Songdo, Dongtan and others) compete for attracting inhabitants – further to foreign capitals-, which is a novel type of global rivalry. Finally, Smart Cities compete in the business arena regarding attracting capital and investments; companies for relocation; inhabitants and workers; illustrating state-of-the-art technology and innovation effectively. As it appeared, recently Smart Cities compete in the arena of exporting know-how to other areas too.

Conclusions

This paper has focused on Smart Cities as a modern phenomenon that attracts significant scientific attention. More specifically, this paper addressed the organizational and business features of the Smart Cities and questioned whether they are or they can be considered SOEs and in such case their particular roles in globalization.

The context of this paper was inspired by the observation that although Smart Cities mostly begin as public projects, recently they do not compete only in the domains of innovation and of state-of-art technology -that transforms them to extensive test-beds and attract international attention to living-labs-, but Smart Cities suggest an extensive novel industry, while they attract investments, enterprises or even inhabitants. This paper stated two research questions regarding Smart City preferred organization structure and regarding Smart City role in international arena.

Literature review and the followed research methodology returned 34 different Smart City cases that were classified according to their mission. Most (twenty three (23) of them) are or can be considered SOEs due to the particular partnership, mission and public funding.

Finally, Smart Cities compete in attracting enterprises and inhabitants, while they compose a new extensive market arena. They are the vehicles for international expansion, since they participate in central Government's political mission regardomg international competition via exporting their innovative know-how.

Possible limitations concern two facts that will be approached by a future research: the examined cases do not cover all the existed Smart Cities, but the sample is quite efficient for useful findings. The resulted e-commerce business models have to be confirmed since they were selected by the authors according to the e-services that the Smart Cities offer.

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