

Public Private Partnership and the promotion of smart cities initiatives - Insights from Rio de Janeiro

Parcerias Público-Privadas e promoção de iniciativas de cidades inteligentes - Insights do Rio de Janeiro

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ABSTRACT

Investing in technology innovation to make a smart city is costly and risky, and the inefficiency and lack of resources from the public sector are hurdles in this sort of investments. Therefore, raising funds through public private partnership (PPP) is viable and it seems to be a tempting solution to overcome the lack of infrastructure and investments in Information and Communication Technology (ICT) provided by the public sector. Against this backdrop, this research attempts to provide insights from PPPs and the promotion of smart city initiatives in the city of Rio de Janeiro, Brazil. The results suggest that PPPs in Rio de Janeiro failed to promote and enhance the quality of life, creating nothing but a 'holographic' city that displays images to seduce tourists and investors while the embedded problems remain unaddressed.

KEYWORDS: Public Private Partnership; Smart city; Moral economy; Holographic city.

RESUMO

Investir na inovação tecnológica para tornar a cidade inteligente é oneroso e de risco, além disso, a ineficiência e a falta de recursos do setor público são obstáculos para esse tipo de investimentos. Por conseguinte, uma forma viável de angariar fundos por meio da Parceria Público-Privada (PPP) parece ser uma tentativa de solução para superar a fraqueza do setor público no fornecimento de infraestruturas e investimentos em TIC. Desta forma, a presente pesquisa busca fornecer algumas percepções da PPP e da promoção de iniciativas de smart city na cidade do Rio de Janeiro. Este artigo sugere que a PPP no Rio de Janeiro não conseguiu promover e melhorar a qualidade de vida de seus cidadãos, criando apenas uma cidade holográfica que exibe imagens para seduzir turistas e investidores ocultando os problemas mais intrínsecos.

PALAVRAS-CHAVE: Parceria Público Privado; Cidade inteligente; Economia moral; Cidade holográfica.

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1 INTRODUCTION

Over 54% of the world's population live in cities. This means that for the first time in history, there are more people dwelling in urban areas than in rural areas, and this percentage is going up according to the UN (2014) which expects that more than 66% of the world's population will be living in cities by the year 2050. Therefore, worries regarding environmental degradation and high agglomeration are some of the main concerns for any political authority of the twenty first century. The UN (2014) suggests that these concerns can be tackled through competent, responsive and accountable governments that apply ICTs in order to provide better public services.

The application of ICT is associated to the term smart city (consensus has yet to be reached regarding its definition). Smart city is somehow understood by the use of ICT to shape the nature, structure and enactment of urban infrastructure, management and economic activity to enhance citizen's life within the city (Neirotti, Marco, Cagliano, Mangano, & Scorrano, 2014; Kitchin, 2014; Lee, Hancock, & Hu, 2014). The use of ICT to manage cities and improve the quality of life has also been bluntly criticized. Townsend (2013) argues smart city is a nebulous utopic idea. Hollands (2014) and Greenfield (2013) argue that citizens are seen as hurdles as they have to be educated on how the ICT can benefit their daily lives. Söderström, Paasche and Klauser (2014) state that the label smart city is nothing but a story told by IT consultants to sell their products. Despite the critics, the idea of becoming a smart city has triggered many ranking systems to assess the level of the smart city, which can be understood as a competitive advantage to attract investment. This research found proximity between the discussion regarding moral economy and the concepts of 'smart city'. It does not advocate that the concepts of pre-market should be re-established in modern times in order to solve present issues. Instead, the aim is to bring attention to the notion of responsibility, the daily problems faced by city dwellers and environmental issues faced by smart cities. As it is a new vein of urban management, along with the intense use of ICT, people empowerment and participation can take the moral economy one step further in the ladder of human development as cities are the place where economic and social interchange occur due to their proximity advantage (Briggs, 2005; Inman, 2005). Hence, smart cities can promote a better moral environment for human interaction either economic driven or human socialization.

However, all these improvements are very costly. This leaves a door open for private organizations to invest their resources in public urban infrastructure, which lacks efficiency and public funds. This research sheds light on the PPP for the promotion of smart cities. Drawing on insights from Rio de Janeiro this research suggests that PPP has dismally failed and Rio de Janeiro is nothing but a holographic city displaying an image to seduce tourists and investment while the real problems remain hidden. It is like being in Plato's cave without knowing that it is possible to turn our heads and questions the images just before our own eyes.

This article is organized in four sections. Section 1 contains the concepts, critics and attempts to create ranks of smart cities. The second section shows a brief overview of the moral economy concept followed by section 3 where the mechanism used to finance public services is presented and Rio de Janeiro is used as an example to provide insights of this financial model. The last section holds the conclusion, limitations of the research and future questions for study.

1.1 Smart city: an overview

The smart city concept is important because unsustainable growth has stressed cities resources and put into check their ability to offer minimal standards of living, thus compromising human interactions. Nowadays, 54% of the world population live in cities and by the year 2050 it is expected that 66% of the world's population will be dwelling in cities (UN, 2014). Strategies to allocate newcomers to urban areas have often failed dismally bringing human suffering and environmental degradation (Brenner, Marcuse, & Mayer, 2009). However, agglomeration does not seem to be the problem, but rather an opportunity. Harrison and Donnelly (2011) argue that a high density of people in cities can be beneficial, making cities more productive, innovative and desirable for the future,

because there is a gain in efficiency as a reflection of having workers and firms in close proximity to one another (Inman, 2005). Therefore, the UN (2014) argues that these issues faced by cities can be tackled with competent, responsive and accountable governments that use information and communication technology (ICT) – that is associated to smart cities' initiatives - to deliver more efficient services to the population.

The concept of smart city is still far from a consensus among researchers. However, it is well-known by the connection with the use of ICT in order to shape the nature, structure and the enactment of urban infrastructure, to influence management and economic activity in an attempt to enhance the citizens quality of life (Neirotti et al., 2014; Kitchin, 2014; Lee et. al., 2014). In this sense, smart cities are places that invest in human and social capital, urban development, ICT, sustainable fuel, economic growth, wise management of natural resources, through participatory governance and societal organizations (Caragliu, Del Bo, & Nijkamp, 2011; Schaffers et al., 2011). Hence smart city stands out as a new approach to promote social inclusion, and the role of the internet, in the creation of new businesses and jobs, new high quality services and for the empowerment of citizens through integrated and synthesized data used to enhance and make the society a healthy happy place for people to live, learn and grow (de Jong, Joss, Schraven, Zhan, & Weijnen, 2015; Dammann, 2013; Acatech, 2012; Chen, 2013). Ahvenniemi, Huovila, Pinto-Seppä, and Airaksinen (2017), say that the term smart city is rather inaccurate as the general goal of smart cities is to improve sustainability with help of technologies, therefore the term smart sustainable cities is proposed (for a thorough review showing the range of smart city definitions and how they are presented see Albino, Berardi, and Dangelico (2015) and Söderström et al. (2014)).

1.2 A critical perspective

The smart city concept can be envisioned in two different ways. It can be seen with focus on ICT to manage the city through a technological perspective; or with a focus on how ICT can support the development of human capital, education, economic development and governance (Kitchin, 2014). According to Van den Bergh and Viaene (2016) examples of cities that opted for a highly technical, infrastructure-intensive approach are Santander, Rio de Janeiro, Barcelona and London while cities such as Amsterdam, Copenhagen, Helsing, Manchester, and Milan chose a more citizen-centric approach. According to Kitchin (2014, p. 2) a neoliberal ethos unites these two points of view prioritizing market-led and technological solutions to city governance and development. The author points out that global high-tech companies such as IBM, CISCO, Microsoft, Intel, Siemens, Oracle and SAP are lobbying for states and cities to adopt their technical solutions while seeking deregulation and open economies to facilitate capital accumulation.

Such a neoliberal approach and the universal solution offered by high-tech companies to better manage cities and improve the life of citizens have given rise to a body of critical engagement. Söderström et al. (2014) argue that in 2011, IBM registered the trademark “smart cities” under the serial number: 79077782; registration number: 4033245¹ to guarantee its share in the struggle among IT companies over visibility and legitimacy in the smart city market. To the authors it is nothing but a story told by IBM aiming to make the company an ‘obligatory passage point’ or an indispensable actor) to the implementation of ICT. Yet according to Söderström et al. (2014) the smart city discourse is a framing device that gives room to two critical issues: (1) there is a concern regarding the perception that collecting data and using softwares are sufficient measures in order to manage urban areas, whereas knowledge, interpretation and specific expertise seem to be unnecessary; (2) the discourse of smart city promotes the belief that urban issues are framed as apolitical matters, aspiring political neutrality. This second issue leads to the interpretation that urban hurdles are associated with demographic trends, climate change and lack of municipal budget, and never with politics. However, according to de Siqueira (2000), even in a neoliberal environment there is a relative consensus that

¹ <https://www.trademarks411.com/marks/79077782-smarter-cities> (accessed on December 7, 2016)

the government is responsible for improving the quality of life in cities targeting inequalities in the access to urban services (Healey, 2006).

Townsend (2013) states that smart city is a technology-led urban utopia, a nebulous idea where huge amounts of digital data can be the source of rationalized planning and management of cities. Shelton, Zook, and Wiig (2014) point out that smart city is internally differentiated as not all spaces of the city are equally smart, which means that whatever the criteria for a city to be considered smart, certain places, people and activities will be privileged over others. Hoornweg (2011) considers that a 'smart city' gives voice to its citizens. Hollands (2014) and Greenfield (2013) regarding the lack of consideration about citizens participation in smart city, argue that citizens are often cast as barriers in the race towards promoting a smart city as they need to be educated regarding the benefits it may bring. Zygiaris (2013) argues that the smart city initiatives have to be taken through public-controlled integrated urban operating systems in order to escape vendor monopolies and provide unlimited data to citizens and authorities that do not have ownership of the smart service (Oliveira & Campolargo, 2015). These thoughts seem to reverberate Lefebvre (2008) who argues that only groups and classes capable of revolutionary initiative can take over and find solutions to urban problems, therefore, pushing theoretical thoughts to redefine the forms, functions, and structures of the city as well as the social needs inherent to urban society.

Then, the smart cities should be envisioned from the human capital where 'clever people' generate clever solutions to urban problems. A human version of the smart city is offered by de Lange and de Waal (2013) who argue that the term social cities can help solve shared problems and provide a humane vision of what is considered 'smart'. In other words, cities are smart when they consider their human capital, create innovative ecosystems and promote new forms of participatory governance, giving rise to a human smart city (Oliveira & Campolargo, 2015, p. 236). There are examples of fiascos such as Masdar City (Abu Dhabi), New Songdo (South Korea) and Plan IT valle (Portugal) which failed to offer advanced techniques to daily activities (Greenfield, 2013).

1.3 Attempts to measure smart city initiatives

The lack of consensus and range of definitions regarding smart city has given room to the rise of different models, methods and measurement indices to assess and gauge city smartness. Zygiaris (2013) offers a smart innovation ecosystem through six layers: green city (driven by new theories of urbanization focused on urban environmental sustainability); interconnection (diffusion of green economy); instrumentation (argues the need of real-time response system made by smart meters and infrastructure sensors); open integration (technological products should be able to communicate and share information); application (real-time city operation); innovation (fruitful environment for new business opportunities). This ecosystem forms the smart city reference model. The proposed model was then used as an analytical framework to assess smart city initiatives for the cities of Barcelona (Integrated-Layer Structure), Amsterdam (Targeted-Layer Structure), and Edinburgh (Limited-Layer Structure).

Giffinger and Gudrun (2010) offer a rank to measure medium sized cities in Europe. Six factors are measured: (1) smart economy; (2) smart people; (3) smart governance; (4) smart mobility; (5) smart environment; and (6) smart living². Lazaroiu and Roscia (2012) provide the smart city index that is used to get funds from the 2020 strategic plan. The index uses a fuzzy methodology in order to define how to better combine different indicators considering their relative importance. The methodology was applied in ten Italian cities. Lombardi, Giordano, and Yousef (2012) advance the traditional triple helix model, a framework for the analysis of knowledge-based innovation systems, adding 'civil society' to the other three factors: university, industry and government. The advanced model states that the four helices operate in a multifaceted urban environment where civic engagement and cultural and social endowments define the relationship between the traditional helices of university, industry and government (p. 139). The framework is established by the

² This rank can be accessed at: <http://www.smart-cities.eu/ranking.html>

association of the four helices linked to the six dimensions of smart city proposed by Giffinger and Gudrun (2010) (mentioned above). The combinations of the elements in this new framework helps to classify performance indicators of smart city. Carli, Dotoli, Pellegrino, and Ranieri (2013) also propose a new conceptual framework to classify smart city indicator, which focuses on the human perspective and the technological content that allows to estimate the indicator using real-world data. The authors group the smart city indicators as: (1) objective and (2) subjective. The proposed framework was applied in the city of Bari, Italy.

The global City Index³ evaluates and ranks the major cities of the world according to their “magnetism” driven by six functions that represent the city’s strengths: economy, research and development, cultural interaction, livability, environment and accessibility. In the 2016 rank, two cities from Latin America appear out of 42 cities. Mexico City in the 37th place and São Paulo in the 38th place (More Memorial Foundation [MMF], 2016). Kylili and Fokaides (2015) argue that the zero energy building (ZEB) is important to the development of smart cities as it improve energy efficiency, energy conservation, and the generation of renewable energy. The proposed model is composed of four dimensions: (1) environmental design and building practices; (2) labeling of buildings’ electromechanical equipment; (3) renewable energy technologies and (4) intelligent energy management. Letaifa (2015) proposes a methodological framework showing how to implement strategies for building smart cities. Lee, Hancock, and Hu (2014) propose a case framework for smart city analysis with six key conceptual dimensions and 17 sub-dimensions of smart city practices. Cohen (2014) proposed the smart wheel and has been ranking smart cities since 2012. The smart wheel consists of six key components: (1) smart environment; (2) smart government; (3) smart living; (4) smart mobility; (5) smart people; and (6) smart economy, which are assigned to a set of indicators in order to measure the smartness of the city. In Latin America 8 cities were assessed: Santiago (justified by the economic attractiveness and smart programs such as Pais Digital, bikesharing and car-sharing); Mexico City (smart and green buildings, bikesharing, car-sharing); Bogota (BRT Transmilenio system, bikesharing, EV taxi fleet in partnership with BYD); Buenos Aires (urban renovation, BRT and bikesharing); Rio de Janeiro (ICT); Curitiba (smarter urban planning, BRT system and green spaces); Medellin (gondolas and electric staircases systems and cultural facilities); and Montevideo (boast on technological programs). Albino et al. (2015) made a compilation of the key dimensions of smart city and four common characteristics were observed: (1) city’s networked infrastructure that provides political efficiency and social and cultural enhancement; (2) business-led urban development and creative activities for the promotion of urban growth; (3) social inclusion of urban dwellers and social capital in urban development; and (4) natural environment as a strategic asset for the future (p. 13).

The models, framework, indicators and ranks presented in the study above are highly centered in affluent regions. The exception is the smart wheel that has ranked 08 cities in South America among the smartest cities (Santiago, Mexico City, Bogota, Buenos Aires, Rio de Janeiro, Curitiba, Medellin, and Montevideo).

Rating systems have gained the attention of city managers and policy makers as they can be used as a competitive advantage to attract entrepreneurs and foster the development of new economic clusters. One example is the city of Busan in South Korea (Berardi, 2013; Lee et al., 2014). However, the race for creating ranks can obfuscate urgent needs such as technology-poor affordable housing or sewage systems, which are arguably more important in many cities,

2 MORAL ECONOMY

Back in the premarket period, economic interaction between people was not governed by economic forces but by a moral universal consensus of solidarity based on reciprocal relations and the right to subsistence. As all members of the community made their living out of local resources, those who had surplus had an obligation to assist those in need (Booth, 1994; Stone, 1984). Premarket economic

³ <http://mori-m-foundation.or.jp/english/ius2/gpci2/index.shtml> (accessed on ...)

interaction was embedded in social relations ruled by kinship, religion and politics (Polanyi, 1968). The rise of an autonomous market shakes the premarket structure and breaks the household concept used by ancient Greeks, where wants and needs were satisfied in the household unit. In fact, an autonomous market linked people otherwise independent, meaning that wants and needs can be satisfied by people out of the kinship or community, becoming a purely economic relation (Caporaso & Levine, 1992; Booth, 1994). Therefore, economic activities transcend social attachments and initiate an enterprise to colonize the lifeworld. Goods begin to dominate producers, and people become heavily dependent on an economic system (Sayer, 2000).

In modern times, the term moral economy was first introduced by E. P Thompson (Robertson, 1997; Thompson, 1971), studying the riots during the 18th century in England, argues that there is a consensus of what is legitimate and illegitimate in economic practices. The author says these values are based on a “traditional view of social norms and obligations of the proper economic functions of several parties within the community, which taken together, can be said to constitute the moral economy of the poor” (p.79). Disturbance of the moral assumption lead to direct actions. A moral economy implies an equitable price mechanism and a fair value (Chiotis, 2015).

Stone (1984, p. 19), argues that:

The moral economy of a society is its set of beliefs about what constitutes just exchange: not only about how economic exchange is to be conducted in normal times but also, as Scott and Thompson have emphasized, when poor individuals are entitled to social aid, when better-off people are obligated to provide aid, and what kinds of claims anyone – landowners, employers, government – can legitimately make on the surplus product of anyone else.

Nevertheless, as put by Bowles and Gintis (1998) the solution to improve contemporary communities’ issues should not be sought in the remaining vestigial values of an earlier age, but in the state and market capability to offer solutions to the problems that dwellers face in their social lives. As Sayer (2000) observes, many of the moral normal in the past would be understood as an outrage and immoral in modern time.

Sayer (2000) argues that due to the persistence of economic problems, the need for a radical political economy has not become obsolete. Reviving and developing the term ‘moral economy’ – a term that must go beyond traditional norms and sentiments in regard to others and include the environment – he aims to shed light on radical political economy as critical social science. The author argues that the state could formalize the traditional norms, such as the assessment on how much inequality should be tolerated, who should be responsible when it comes to guarantee the future of next generations and of other species. Later Sayer (2015) argues that moral economy should be considered when dealing with issues such as neoliberal austerity and climate change. Arnold (2001) offers a different and interesting point of view associating moral economy with fair trade in order to enhance development. In this sense, morality is about acting in a way that does not harm anyone else, creating a state of affairs that is accepted and considered beneficial (Chiotis, 2015).

3 FINANCING CITIES

Any city aiming to achieve its full economic potential needs to provide infrastructure and public services that complement private capital and labour in production. It also needs to create a physical and social environment that is valued by its citizens. The former accounts for roads, bridges and telecommunication networks. The later accounts for education, safe streets, and a clean and healthy environment (Inman, 2005). These services have been historically financed by governments to develop most of the physical infrastructure. This is due to governments’ characteristics to make and enforce decisions (Stocker, 1998; Smart Cities Council [SCC], 2015). An important point to mention is that fiscal decentralization is important in this process as local sectors are more sensitive to regional and local conditions. Moreover, decentralization can also be seen as a source of development (Oates, 1993; 1999). Despite intergovernmental fiscalization being inevitable, developing economies

such as Brazil's, has municipalities with already significant degrees of fiscal autonomy (Bird, 2012). It is then implied that local government should be able to raise their own funds from their revenue sources. Inman (2005) offers a range of possibilities to finance cities public and business services. For example, shared infrastructure should be financed by city-wide debt paid for by city surcharge on property and Business tax, plus user fees whenever possible (Oates, 1993; 1999).

However, financing smart city projects (city projects can be understood as actions to tackle a complex processes of urban and territorial transformation that are stressing the capacity of cities to offer basic services due to the number of people living in cities) is rather different to financing public services, as it requires resources that are significant and often different from traditional ones. So, barriers are set up for the financing of smart city innovative technological solutions such as a) perception of high risk when investing in innovative solutions and energy efficiency measures; b) uncertain energy price policies and uncertainty about fossil fuel prices; c) large volumes of investment required; d) long-term delays before reaching maturity/profitability; e) limited capacity for public funding: high public deficits in municipalities and incapacity to raise funding from capital markets should be overcome.

Therefore, in order to attract the necessary capital for investments, the following actions are necessary: a) reduce the real and perceived risks of investment; b) attract long-term finance from specialised institutions (i.e. pension funds); c) develop mechanisms to aggregate projects. In order to create bankable and sizeable investments with reduced transaction costs; d) develop off balance sheet investment systems with private mechanisms (development of single purpose vehicles and PPPs) (Smart Cities, 2013).

This research develops the concept of PPP as it focuses on the case of Rio de Janeiro, Brazil, which sought partnership with the private sector to finance its innovative technological solutions with the intention of becoming a smart city.

3.1 PPP: Making Rio a smart city

According to the literature, there is an undefined line between politics (public) and economics (private). As business firms are increasing their interdependence with government agencies, at the same time government agencies are becoming closer to business firms, the traditional dichotomy of the public – private sector becomes less useful. There are few, if any, complex organizations that are either purely public or private (Larkin, 1994; Dahl & Lindblom, 1953; Bozeman, 1984; 1987), which makes of public private partnership (PPP) a natural phenomenon. On the other hand, Heldeweg, Sanders and Harmsen (2015) argue that PPP is an ambiguous term being called a container concept and even an enigma (Bloomfield, 2006; Hodge, Greve, & Boardman, 2010). According to Busch and Givens (2013) and Chen, Hubbard, and Liao (2013) PPP is the simple cooperation between the public and private sectors to achieve a set of goals, mainly through a contract to deliver public services.

PPP are driven by rapid urbanization, lack of public funds and inefficiencies of public services regarding their ability to maintain, build and operate public urban infrastructure creating an environment for private organizations to invest their resources in public urban infrastructure (Koppenjan & Enserink, 2009). Therefore, PPP can be understood as a key asset for both government and market failure, matching the advantages of private sector with cities hurdles in an attempt to solve urban problems (Bennett, James, & Grohmann, 2000). PPP initiatives are found in a range of partnerships, for example, to improve accessibility of low-income families to housing in Southern Nigeria (Ibem, 2011); to promote economic development (Bonu, 2004); social services (Petrescu, 2006); achieve resilience in disaster management (Busch & Givens, 2013); road infrastructure (Evdorides & Shoji, 2013); tourism (Peric, 2009; Zhidkoblinova, Stavbunik, & Spanova, 2016); and smart cities initiatives, which are the focus of this research. Examples of cities that implemented smart solutions through PPP are Hong Kong and New Songdo (Anthopoulos, 2017); France (Dupont, Morel, & Guidat, 2015); Barcelona (Capdevila & Zarlenga, 2015); Amsterdam, where PPP produced more than 80 pilot projects considering many areas of urban life (Fitzgerald, 2016); Masdar City and Rio de Janeiro (Alizadeh, 2017).

It might look like a straightforward solution, but projects focusing on socioeconomic value are difficult to monetize (Olivero, Medarova-Bergstrom, & Rizos, 2013). Moreover, finding the right balance between the focus on short-term return and the long-term perspective needed to accomplish sustainability can involve an entire range of new objections such as unequal access to services, postponement of investment, renegotiation that favors private providers and much more (Koppenjan & Enserink, 2009).

PPP in Brazil were regulated in 2004 and must involve public payment as stated in federal law 11.079/04. PPPs are also divided in two groups: sponsored concession and administrative concession. In the former group, the private partner recovers the money invested by charging fees from users and by public payments. Examples of this group of PPPs are the construction of roads, parking lots and subway line operation. In the case of administrative concession, the private partner gets payed exclusively by the government, as occurs with the construction of prisons, hospitals and schools. In Rio de Janeiro, PPP programs were released in 2009, regulated by the complementary law 105, on december 2, 2009, named PROPAR-RIO (*Programa Municipal de Parcerias Público-Privadas*). Examples of PPP projects in the city of Rio de Janeiro are: PPP *Porto Maravilha* where contract values are over R\$ 7.600.000 with a length of 15 years through an administrative concession and PPP *Parque Olímpico*, also an administrative concession of 15 years with a contract value of R\$ 1.351.969.700,65 (Município do Rio de Janeiro).

Rio de Janeiro became an international benchmark with the implementation of Smart City projects and won the World Smart City Award 2013 in Barcelona⁴. The most expressive and mentioned action towards becoming a smart city was the implementation of *Centro de Operação Rio* (COR) that uses real-time analytics to grasp how a city functions and is regulated providing information regarding traffic, public transport, weather and energy services to name a few. COR also used data among other things to build predictive models of every day life in the city (Kitchin, 2014). Nevertheless, these actions must be seen with caution. The aspects of seduction and beautification (Newton, 2013) are used as a cosmetic strategy to hide unpleasant sights, for example, producing an imaginary cenario that Rio de Janeiro can use for 2014 World Cup and the 2016 Olympic in order to improve the commercial appeal of the events (Steinbrink, 2013), hiding the contrasts in the city and sell a specific image that can guarantee profits for the investors (Mela, 2014)

Therefore, this article raises concern as to whether Rio de Janeiro has what it takes to really be considered a smart city. Scandals of corruptions in the building of infrastructure for the 2014 World Cup and the 2016 Summer Olympic Games reached a bizar level and every day new scandals are unfolded. The former governor of Rio de Janeiro, Sérgio Cabral was arrested and acused of corruption. One of the most important universities of Rio de Janeiro, UERJ (Universidade Estadual do Rio de Janeiro), faced a terrible financial crises leading to the suspension of its activities due to the lack of basic conditions of work and study. Scholarships payed by FAPER (*Fundação de Amparo a Pesquisa do Estado do Rio de Janeiro*) were constantly being delayed, which had a tremendous impact on knowledge development. Public servants of many areas also went without salary for months.

Seeing this chaotic scene it is not possible to agree to Rio de Janeiro being considered a smart city. It does not comply to any smart city idea of moral economy principles. The city has invested in ICT in partnership with global high-tech companies, but on the other hand other more important issues were not tackled. The so-called smart city also privileged some areas and activities over others failing in promoting inclusion. For these reasons, this research suggests that Rio de Janeiro is a holographic city reproducing images with the assistance of PPP to attract tourists and investments while the basic needs to assist its dwellers are not served. In this sense the concept of smart city is only a label trying to promote a city in decline, which has been considered by the critical perspective on smart cities.

⁴ <http://smartcitiescouncil.com/article/rio-de-janeiro-wins-top-smart-city-honors> (accessed on April 03, 2017)

4 CONCLUSION

This article has attempted to provide insights as to whether PPP can promote smart city initiatives. The debate regarding smart city concepts, its critics and attempts to measure the smartness of the city were presented. Associated with the term moral economy this article tried to bring the notion of responsibility towards citizens and the environment in the fashion of smart city. Investments in infrastructure to improve the life of citizens and for sustainable practices to ease the stress on the environment, involve high costs. The inefficiency and lack of resources from the public sector made room for the public private partnership (PPP), that is the cooperation between the public and private sectors to overcome the liability of public services.

In Brazil, PPP were regulated in 2004 by federal law 11.079/04. In Rio de Janeiro PPP became possible in 2009 with complementary law 105 that established the PROPAR-RIO (*Programa Municipal de Parcerias Público-Privadas*). One PPP used in the process of smart city in Rio de Janeiro was the creation of COR (*Centro de Operações Rio*) that uses real time analytics providing information regarding traffic, public transport, weather, energy services etc. Though these are important tools to manage the city, this article suggests that in the case of Rio de Janeiro, PPP failed to promote what it takes to be a smart city, creating nothing but a holographic city that displays images to seduce tourists and investors while the real problems are hidden.

A smart city is a place that uses ICT to enhance the life of its citizens. It invests in human and social capital, sustainable fuel, economic growth, wise management of natural resources (Caragliu, Del Bo, & Nijkamp, 2011; Schaffers et al., 2011). In other words a smart city uses integrated and synthesized data to improve and make society a healthy, happy place for people to live, learn and grow (de Jong et al., 2015; Dammann, 2013; Acatech, 2012; Chen, 2013). Unfortunately, Rio de Janeiro seems to have failed dismally. Scandals of corruption in the infrastructure for the 2014 World Cup and the 2016 summer Olympic Games reached a bizarre level. The former Governor Sergio Cabral was arrested, charged with corruption. UERJ, an important hub of creation and maintenance of knowledge, was literally destroyed and FAPERJ did not pay the scholarship fees. State employees were not paid for months. On this vein, PPP in Rio de Janeiro failed to provide what it takes to become a smart city, to empower people and maintain economic and political stability to avoid disturbance in the “moral of the city”.

This article aimed to provide insights regarding PPP and the promotion of Rio de Janeiro as a smart city. The limitation of this article is its own descriptive nature. Future research could include empirical work comparing PPP initiatives in technological innovation to see whether they have had more success than in Rio de Janeiro, it would also be interesting to see papers discuss the smart city concepts through a more critical lens.

REFERENCES

- Acatech, D. (2012). *Smart Cities*.
- Ahvenniemi, H., Huovila, A., Pinto-Seppä, I., & Airaksinen, M. (2017). What are the differences between sustainable and smart cities? *Cities*, 234-245.
- Albino, V., Berardi, U., & Dangelico, R. M. (2015). Smart Cities: Definitions, dimensions, performance and initiatives. *Journal of Urban Technology*, 3-21.
- Alizadeh, T. (2017). An investigation of IBM's Smarter Cities Challenge: What do participating cities want? *Cities*, 70-80.
- Anthopoulos, L. (2017). Smart utopia VS smart reality: Learning by experience from 10 smart city cases. *Cities*, 128-148.

- Arnold, T. C. (2001). Rethinking moral economy. *American Political Science Association*, 85-95.
- Bennett, E., James, S., & Grohmann, P. (2000). *Joint venture public partnerships for urban environmental services: Report on UNDP/PPPUE's Project Development Facility 1995-1999*. New York.
- Berardi, U. (2013). Sustainability assessments of urban communities through rating systems. *Environment, Development and Sustainability*, 1573-1591.
- Bird, R. M. (2012). *Subnational taxation in large emerging countries: BRICS plus one*.
- Bloomfield, P. (2006). The challenging business of long-term public-private partnerships: Reflections on local experience. *Public ADM Review*, 400-411.
- Bonu, N. S. (2004). *Public Private Partnerships (PPP) for Economic Development: A Case Study of Botswana Development Corporation (BDC) Limited*. Chimera, 43-52.
- Booth, W. J. (1994). On the idea of the moral economy. *American Political Science Review*, 653-667.
- Bozeman, B. (1984). Dimensions of 'publicness': An approach to Public Organization Theory. In B. Bozeman, & J. Straussman. *Directions in Public Administration*. Monterey: Brooks/Cole, 46-62.
- Bozeman, B. (1987). *All organizations are public: Bridging public and private organization theory*. São Francisco: Jossey-Bass.
- Bowles, S., & Gintis, H. (1998). The moral economy of communities: Structured populations and the evolution of pro-social norms. *Evolution and Human Behavior*, 3-25.
- Brenner, N., Marcuse, P., & Mayer, M. (2009). Cities for people, not for profit. *City*, 176-184.
- Briggs, G. (2005). The intelligent City: Ubiquitous network in humane environment. In M. Jenks, & N. Dempsey. *Future forms and design for sustainable cities*. Burlington: Architectural Press.
- Busch, N. E., & Givens, A. D. (2013). Achieving resilience in disaster management: The role of public-private partnership. *Journal of Strategic Security*, 1-19.
- Capdevila, I., & Zarlenga, M. I. (2015). Smart city or smart citizens? The Barcelona Case. *Journal of Strategy and Management*, 266-282.
- Caporaso, J., & Levine, D. (1992). *Theories of political economy*. New York: Cambridge Press.
- Caragliu, A., Del Bo, C., & Nijkamp, P. (2011). Smart Cities in Europe. *Journal of Urban Technology*, 65-82.
- Carli, R., Dotoli, M., Pellegrino, R., & Ranieri, L. (2013). Measuring and managing the smartness of cities: A framework for classifying performance indicators. *IEEE International Conference on Systems, Man, and Cybernetics*, 1288-1293.
- Chen, M. (2013). Towards Smart City: M2M Communications with software agent intelligent. *Multimed Tools Appl*, 167-178.

- Chen, C., Hubbard, M., & Liao, C.-S. (2013). When public-private partnerships fail: Analyzing citizen engagement in public-private partnerships - Cases from Taiwan and China. *Public Management Review*, 839-857.
- Chiotis, V. (2015). The morality of economic behaviour. *Journal of Global Ethics*, 188-204.
- Cohen, B. (2014). *The smartest cities in the world 2015: Methodology*. CO. EXIST, 2014. Retrieved from <http://www.fastcoexist.com/3038818/the-smartest-cities-in-the-world-2015methodology>
- Dahl, R. A., & Lindblom, C. E. (1953). *Economics and Welfare*. New York: Harper and Brothers.
- Dammann, S. (2013). *Smart Cities and Communities Perspective of DG Energy - C2*. Paper presented at Forum, Stoke-on-Trent.
- De Jong, M., Joss, S., Schraven, D., Zhan, C., & Weijnen, M., (2015), Sustainable–Smart– Resilient– Low Carbon–Eco–Knowledge Cities: Making sense of a multitude of concepts promoting sustainable urbanization, *Journal of Cleaner Production*. doi: 10.1016/j.jclepro.2015.02.004
- De Lange, M., & De Waal, M. (2013). *Owning the city: New media and citizen engagement in urban design*. First Monday. Retrieved from <http://firstmonday.org/ojs/index.php/fm/article/view/4954/3786>
- De Siqueira, M. M. (2000). Redes sociais na gestão de serviços urbanos. *Revista de Administração Pública*, 179-198.
- Dupont, L., Morel, L., & Guidat, C. (2015). Innovative public-private partnership to support smart city: The case of "Chaire REVES". *Journal of Strategy and Management*, 245-265.
- Evdorides, H., & Shoji, M. (2013). Public–private partnerships for road infrastructure services in Zambia. Proceedings of the Institution of Civil Engineers-Management. *Procurement and Law*, 277-286.
- Fitzgerald, M. (2016). Data-Driven City Management: A Close Look at Amsterdam's Smart City Initiative. *MIT Sloan Management Review*, Cambridge, 57(4).
- Giffinger, R., & Gudrun, H. (2010). Smart Cities ranking: An effective instrument for the positioning of Cities. *ACE: Architecture, City and Environment*, 12, February, 7-25.
- Greenfield, A. (2013). *Against the smart city*. New York: Do projects.
- Harrison, C., & Donnelly, I. A. (2011). *A Theory of Smart Cities*. IBM Corporation.
- Healey, P. (2006). Transforming governance: Challenges of institutional adaptation and a new politics of space. *European Planning Studies*, 299-320.
- Heldeweg, M. A., Sanders, M., & Harmsen, M. (2015). Public-private or private-private energy partnerships? Toward good energy governance in regional and local green gas projects. *Energy, Sustainability and Society*, 1-12.
- Hodge, G. A., Greve, C., & Boardman, A. E. (2010). *International handbook on public private*. Cheltenham: Edward Elgar.

- Hollands, R. G. (2014). Critical interventions into the corporate smart city. *Cambridge Journal of Regions, Economy and Society*, 61-77.
- Hoornweg, D. (2011). *Smart Cities for Dummies*. Retrieved from <http://blogs.worldbank.org/sustainablecities/smart-cities-for-dummies>
- Ibem, E. O. (2011). The contribution of Public-Private Partnerships (PPPs) to improving accessibility of low-income earners to housing in southern Nigeria. *J Hous and the Built Environ*, 201-217.
- Inman, R. (2005). *Financing Cities*. [S.l.].
- Kitchin, R. (2014). The real-time city? Big data and smart urbanism. *GeoJournal*, 1-14.
- Koppenjan, J. F. M., & Enserink, B. (2009). Public-Private partnership in urban infrastructures: Reconciling private sector participation and sustainability. *Public Administration Review*, 284-296.
- Kylili, A., & Fokaides, P. A. (2015). European smart cities: The role of zero energy building. *Sustainable Cities Society*, 86-95.
- Larkin, G. R. (1994). Public-private partnerships in economic development: A review of theory and practice. *Economic Development Review*, 7-9.
- Lazaroiu, J. H., & Roscia, M. (2012). Definition methodology for the smart cities model. *Energy*, 326-332.
- Lee, J. H., Hancock, M. G., & Hu, M.-C. (2014). Towards an effective framework for building smart cities: Lessons from Seoul and San Francisco. *Technological Forecasting & Social Change*, 80-99.
- Lefebvre, H. (2008). The right to the city. In *Writing on Cities*. [S.l.]: Blackwell, 147-159.
- Letaifa, S. B. (2015). How to strategize smart cities: Revealing the smart model. *Journal of Business Research*, 1414-1419.
- Lombardi, P., Giordano, H. F., & Yousef, W. (2012). Modelling the smart city performance. *Innovation: The European Journal of Social Science Research*, 137-149.
- Mela, A. (2014). Urban public space between fragmentation, control and conflict. *City, Territory and Architecture*, 1-15.
- More Memorial Foundation. (2016). *Global Power City Index*. Retrieved from <http://mori-m-foundation.or.jp/english/ius2/gpci2/index.shtml>
- Município do Rio de Janeiro. *Introdução ao Conceito de PPP e Concessões*, Rio de Janeiro.
- Neirotti, P., Marco, A., Cagliano, A. C., Mangano, G., & Scorrano, F. (2014). Current trends in Smart City initiatives: Some stylised facts. In *Cites*, vol. 38, 25-36.
- Newton, C. (2013). The reverse side of the medal: About the 2010 World Cup and the beautification of the N2 in Cape Town. *Urban Forum*, 93-108.

- Oates, W. E. (1993). Fiscal decentralization and economic development. *National Tax Journal*, 237-243.
- Oates, W. E. (1999). An essay on fiscal federalism. *Journal of Econometric Literature*, 1120-1149.
- Olivero, S., Medarova-Bergstrom, K., & Rizos, V. (2013). *Smart cities stakeholder platform - Financing models for smart cities*. (J.N. Ferrer, Ed). [S.l.].
- Oliveira, A., & Campolargo, M. (2015). From smart cities to human smart cities. In *System Sciences (HICSS)*, 48th Hawaii International Conference, 2336-2344.
- Peric, M. (2009). Criteria for setting up the public-private partnership in Croatian tourism and selection of optimal public-private partnership model 1. *Business Excellence*, 111-126.
- Petrescu, C. (2006). Public-Private Partnership in Social Service Supply. *Sociology Romaneasca*, 39-57.
- Polanyi, K. (1968). *Primitive, archaic and modern economies: Essays of Karl Polanyi*. Garden City: Doubleday.
- Robertson, A. (1997). Beyond apocalyptic demography: Towards a moral economy of interdependence. *Ageing and Society*, 425-446.
- Sayer, A. (2000). Moral economy and political economy. *Studies in Political Economy*, 79-103.
- Sayer, A. (2015). Time for a moral economy. *Geoforum*, 291-293.
- Schaffers, H., Komninos, N., Pallot, M., Trousse, B., Nilsson, M., & Oliveira, A. (2011). Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation. *The Future Internet Assembly*, 431-446.
- Shelton, T., Zook, M., & Wiig, A. (2014). The actually existing smart city. *Cambridge Journal of Regions, Economy and Society*, 13-25.
- Smart Cities. (2013). *Financing models for smart cities*. [S.l.].
- Smart Cities Council. (2015). *Smart Cities Financing Guide*. Arizona.
- Söderström, O., Paasche, T., & Klauser, F. (2014). Smart Cities as corporate storytelling. *CITY*, 18(14), 307-320.
- Steinbrink, M. (2013). Festifavelisation: Mega-events, slums and strategic city-staging - The example of Rio de Janeiro. *Die Erde*, 129-145.
- Stocker, G. (1998). Governance as theory: Five propositions. *International Journal of Social Sciences*, 17-28.
- Stone, D. A. (1984). *The disabled state*. London: MacMillan.
- Thompson, E. P. (1971). The moral economy of the English crowd in the eighteenth century. *Past and Present*, 76-136.

- Townsend, A. M. (2013). *Smart Cities: Big data, civic hackers, and the quest for a new utopia*. United States of America: Norton & Company.
- UN. (2014). *World Urbanization Prospects: The 2014 Revision, Highlights*. New York.
- Van Den Bergh, J., & Viaene, S. (2016). Unveiling smart city implementation challenges: The case of Ghent. *Information Polity*, 5-19.
- Zhidkoblinova, O., Stavbunik, Y., & Spanova, B. (2016). Public-Private partnership as a tool of public tourism sector Administration. *Journal of Environmental Management & Tourism*, 250-252.
- Zygiaris, S. (2013). Smart City reference model: Assisting planners to conceptualize the building of Smart City innovation ecosystems. *Journal of the Knowledge Economy*, 217-231.