Social innovation in public sector services

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Abstract: This paper proposes a new conceptual model of social innovation in public sector services. The study uses qualitative analysis to understand the contributions of innovation in social development by examining the smart city concept using the example of the Bandung Government in Indonesia. The Bandung Government has been successfully developing innovative solutions towards service quality in public sector management. This study develops new perspectives of social innovation that can be applied to improve the public-sector reforms in developing countries.

Keywords: social innovation; smart city; virtual entrepreneurship; public sector services.

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1   Introduction

Innovation is a necessity in the public services sector to improve public service performance, gauge community needs, and service efficiency (Mulgan and Albury, 2003; Ramadani et al., 2017). The public sector has lagged the business sector in developing innovation. Three factors contribute to the lack of innovation in the public sector: absence of reward systems, absence of measurement systems, and no individual motivation (Suwarno, 2008). Innovation management systems are the key to success in the public sector (Anggadwita and Dhewanto, 2013; Ferreira et al., 2017). Social innovation is most often applied in the public service sector. According to Pollitt and Hupe (2011), social innovation is one of the 'magic concepts' that have been embraced in recent years as a modernisation or reform strategy for the public sector. Social innovation serves two purposes: overcoming the major challenges facing modern society today while coping with the diminishing role of government (Bekkers et al., 2013). Public expectations continue to drive governments to develop new social innovations.

Local governments in Indonesia continue to generate new social innovations in public services delivery, particularly the Bandung Government. Technological advances have led to the use of internet facilities to be important for real-time communication to address social problems (Ratten et al., 2017). Rapid technological developments utilised by the Bandung Government include the smart city concept. Smart city is a construct that connects information and communication technology (ICT) within urban management and development to utilise city resource effectively and efficiently. The presence of smart city will maximise the delivery of public services to citizens and support sustainable development (Kamil, 2015). Smart city is combines ICT and social innovation to improve service for the community effectively. This concept was first applied in Bandung by Mayor Ridwan Kamil. The Bandung Government prioritises smart city programs that include smart services in government, education, transportation, health, energy, surveillance, community, payment, and commerce (Kamil, 2015). The Bandung Government through the smart city concept integrates congestion, garbage accumulation, damaged roads, erosion issues in real time and determines the best solution quickly. The ideal city is a place that provides social harmony for its people, which can balance administration with cultural and social functions (Ratten, 2017).

This study aims to identify how social innovations converge in the implementation of smart cities, develop new perspectives, and conceptualised social innovation models that can be applied to improve public sector reform in developing countries. The example of the successful implementation of the smart city program in Bandung is used as an example. Generally, people assume that public sector services are complicated with long bureaucratic processes, such as renewing a driver's license or tax payment. Through smart city implementation, public sector service processes can be done in real time and executed effectively and efficiently. The public-sector innovation process adds the political context that makes it more complicated. It is important to understand how specific characteristics of the public sector institutional context affect social innovation practices. This research suggests potential future pathways for social innovation in the public sector that can increase the productivity, growth and competitiveness in developing countries through the implementation of the smart city concept. Implications for policy makers are discussed.

2   Social innovation

Social innovation focuses on the process of social interactions intertwined with innovation, which is an idea, practice, or process of discovering new ideas or methods that combine creativity and resources (De Vries et al., 2016; Rogers, 2003; Schumpeter, 1942). In business, innovative solutions are value adding (Permatasari and Dhewanto, 2013). This also applies to the public sector (Anggadwita and Dhewanto, 2013). Social innovation is a process of creating new ideas to provide better service in society that responds often to a social challenge or problem (Hubert, 2010).

Goldenberg et al. (2009) defined social innovation as "the implementation of new ideas or ways to improve and regenerate social activities, behaviour, processes or products to sort out social and economic challenges." The goal of social innovation is to promote an innovative and learning society (Hauser et al., 2007; Hubert, 2010). A social innovation can be an idea, a social process, a product, a service, a regulation, an intervention or social movement or a combination of these factors (Amar and Juneja, 2008; Goldenberg et al., 2009; Permatasari and Dhewanto; 2013; Phills et al., 2008). However, a successful innovation has five characteristics: novelty, tested technology, efficiency, market, and successful implementation. Innovation is related to novelty (Permatasari and Dhewanto, 2013) and adds value (benefit) invention and new knowledge (Herstad and Ebersberger, 2014; Kadiman, 2008; Permatasari and Dhewanto, 2013). Successful social innovations result in positive change, human betterment actions, transformative influences; and models (Goldenberg et al., 2004).

Barriers to social innovation is that the process can involve risks so one must have vision, persistence, and confidence to develop products or services (Hubert, 2010). Social innovation results in multi-level interactions of relevant stakeholders, such as public organisations, citizens, and businesses who have varying interests and resources (Bekkers et al., 2013). In other words, the private sector, public sector, volunteer sector, and civil society can contribute to the process of social innovation (Mair, 2010; Hulgård, 2010; Mulyaningsih et al., 2014). Financial issues, governance, skills, and innovation measurement are the main challenges to social innovation (Hubert, 2010).

2.1   Public sector innovation

Innovation in the public sector is a huge challenge worldwide and involves a coordinated effort to respond to social and technological challenges effectively (Anggadwita and Dhewanto, 2013). Public sector innovation is important to increase the reputation of governments and image of public services (Lekhi, 2007). Innovation can also bring about changes in public service governance by increasing the level of accountability and transparency, performance, and/or levels of user engagement, and satisfaction. The OECD (2012) defines public sector innovation as the "implementation by public organisations about new or significantly improved operations or products", including content and services, and the instruments used to deliver it. Public sector innovation has become a major priority of governments around the world (Mulgan, 2006). Innovation is an embedded system that can be developed locally and institutionally to deliver quality public services thereby increasing trust. Public sector innovation includes processes, administration, systems, and conceptual changes. However, the primary focus in public sector innovation is improving internal administrative processes that are frequently

technology driven (Halvorsen et al., 2005). According to Moore (2005), two different models for understanding innovation in the public sector are special breakthroughs that have a major impact on transforming the socio-economic system; and the latest system efficiency because of innovative organisations and continuous improvements.

Public sector innovation has significant influences on economic development. Schoeman et al. (2012) stated that innovation involves improving performance in terms of effectiveness or efficiency. While other researchers argued that "the driving force for public governance is more necessary in solving society issues rather than make public sector organisations (public services) efficiently" (Stoker, 1998; Pierre and Peters, 2000; Bovaird, 2004). The driving force in public sector innovation is technology change. For example, e-government is focused on controlling base projects as well as creating government websites towards structures and processes rather than creating business value and networking (Bovaird, 2004; Langford and Harrison, 2001). Therefore, the application of new ideas digitally gives rise to better public services that have more usefulness are faster and add value to serve the community more rapidly. The ability of government to solve social problems is limited. Therefore, government should focus on community needs while at the same time assess satisfaction (Guy and Hitchcock, 2000).

2.2   *Bandung Smart City*

Bandung is known as an innovative, economically progressive city in Indonesia (Dana, 2014). Ridwan Kamil is the Mayor and seeks to create a culture of innovation and technology that relies on continual improvement of existing core industries, fostering growth of start-ups, and has earmarked an opportunity zone within the Bandung City centre (SIEMENS, 2016). Based on data from Central Statistics Agency Bandung (2016), the population of Bandung is 2.5 million people, with 60% between the ages of 10 to40 years. Bandung is the third largest city in Indonesia and has 80 high schools and universities (SIEMENS, 2016). Bandung has implemented a smart city plan as part of their culture of innovation and technology. In doing so, Bandung has received various awards, including Indonesia Smart Nation Award in 2015, Telkom Nusantara Award in 2016, Indonesian Digital Economy Award in 2016, the 2nd Indonesia Smart Nation Awards in 2016, Indonesia OpenGov Leadership Forum in 2017, the thematic award from the Ministry of Internal Affairs for the category of Smart City Governance Based on Information Technology in 2017, and Yokkato Awards in 2017.

Bandung changed to an Open Government Indonesia (OGI) system in 2013 to be more open, participative, and innovative. Mayor Ridwan Kamil implemented the system and since doing so, has reaped three benefits in connecting, monitoring, and controlling government services thereby increasing the level of public confidence (Kamil, 2015).

Based on the report published by Center of Regional Science (2007), smart city characteristics consist of economy, people, governance, mobility, environment, and living. Cohen (2014) introduced smart city through the 'smart city wheel' framework with six main indicators:

1   environment

2   mobility

3   government

4   economy

5   society

6   quality of life.

According to Ridwan Kamil, a smart city should have community involvement in planning, networking, minority participation, enhanced economic competitiveness, leadership role models, and historical and cultural awareness (SIEMENS, 2016). The determination of BSC will support various potential sectors in Bandung, including hospitality and tourism, technology, industrial centres of SMEs, education, and fashion. The milestone consists of:

1   technology infrastructure with high speed internet connections

2   smart government-technology

3   open government transparency, sharing and collaboration

4   empowerment: through computer literacy, citizen engagement, and a vibrant digital industry

5   Technopolis: ICT-based economic empowerment zone.

Table 1 details the implementation programs of BSC.

Table 1   BSC implementation (continued)

No.	Smart city program	BSC implementation
1	Smart government	• Open communication on social media
		• Government YouTube channel
		• Citizen complaint online (LAPOR)
		• SIP Bandung Juara information system to facilitate public participation in monitoring the performance of services that take place at the district or sub-district level
		• Online permission (HAY.U) public service system that supports the issuance process of permits
		• Bandung Integrated Resource Management System (BIRMS) manages government resources in an integrated manner to support financial accountability, including e-project, e-planning, e-procurement, e-Rup, e-contract, e-Swakelola (independent management), e-progress, e-performance, and e-asset
		• Cloud computing e-Kelurahan connects the mayor's office with all departments and government agencies, 30 districts, and 151 villages in Bandung
		• Sabilulungan facilitates transparency in the implementation of social assistance programs through online media
		• SAKIP or performance accountability system of government institutions is an information system built to report on the performance of government agencies
		• City apps manage cities and governments that can be accessed online via Smartphone or computer with over 300 applications developed so far

Source: Based on Kamil (2015) and Nadapdap et al. (2016)

Table 1   BSC implementation (continued)

No.	Smart city program	BSC implementation
2	Smart education	• Smart digital class is a facility sponsored by PT. Telkomsel consisting of an 88-inch interactive touch screen, smart teacher desk, library inside school server, and internet school area (Wi-Fi zone)
		• Bandung cloud is knowledge sharing from the community of teachers or educators, students, researchers, lecturers, and the public based on cloud computing that can be accessed by the community
		• Development of social media platform as a medium of learning
		• Workshop for teachers with 1,000 content results that can be accessed
3	Smart transportation	• Smart parking system utilises automatic machines
		• Monitoring traffic through CCTV installed at several intersection points (traffic lights) in Bandung
		• Call centre service/travel information
		• Travel guide
		• Traveller device and VMS
4	Smart health	• E-Puskesmas manages health services for citizens of Bandung which is the result of cooperation between the health office and PT. Telkom Indonesia
		• wecare.id is a health donation site
5	Smart energy	• Smart metre is a tool created by LPPM ITB that monitors the electric energy of the community to improve the effectiveness of electric energy consumption (LPPM ITB, 2017)
6	Smart surveillance	• Command centre is a city surveillance system connected with CCTV and GPS and spread in various critical points in Bandung
		• Panic button application
7	Smart environment	• Bandung digital public place (movie park)
		• Smart green space (green park, city park)
		• 10,000 free Wi-Fi access point which is a cooperation program of PT. Telkom and Bandung Government built in various public facilities Pedestrian street
8	Smart community	• Bandung Creative and SmartHub
		• Bandung passport
9	Smart payment	• Online taxes to make it easy for taxpayers to access the administration and pay taxes online
		• E-parking
		• Bandung smart card
10	Smart commerce	• Bandung Teknopolis is an industrial area integrated with technology
		• Bandung digital valley (for start-up)

Source: Based on Kamil (2015) and Nadapdap et al. (2016)

3 Methodology

In this paper is used a qualitative research method approach that is descriptive and holistic (Dana and Dana, 2005). Taylor and Bogdan (1984) and Moleong (2013) explains that qualitative research is appropriate when it is important to understand the phenomenon of what is experienced by subjects such as behaviour, perception, motivation, and actions holistically. Qualitative descriptive formats are more appropriate when used to research problems that require in-depth study (Bungin, 2010; Dana and Dumez, 2015).

The conceptual framework is one qualitative approach in which the process of constructing the conceptual framework in the study is based on existing literature and refined through the implementation review. According to Jabareen (2009), a conceptual framework is a network, or 'airplane', where interrelated concepts together provide a thorough understanding of a phenomenon. The conceptual framework is not just a collection of concepts but, rather, constructs in which each concept plays an integral role. A holistic approach is used to generate an integrative conceptual framework for reference. The conceptual model can be used as a basis in the criteria of choosing the right and comprehensive case study.

4 Findings

4.1 Drivers and barriers of BSC in public sector services

A smart city is a way in which cities can transform a public service and procedures from slow to fast, not transparent to transparent, top-down becomes participatory, from manual to digital, and through the concept is a lot of space that is likely to become a land of corruption to be closed (Pengawasan, 2016). Smart city encourages the sharing of information based on the need for community participation (Ratten, 2017). BSC in its implementation faces various barriers, including infrastructure, coordination, and human resources (Lestari, 2016). The problem of infrastructure in Bandung which became one of the important problems is the internet network that has not been evenly distributed and optimal. Infrastructure in BSC implementation is fundamental.

The next issue is coordination, where there should be good communication between government, academics, businesses, and the community. A smart city forum was held but communication to the population has been limited, especially in regional areas. Human resource training of government employees and the public to fully understand the systems and utilise them has been limited. Skill sets need built. Many of the personnel, especially IT personnel were outsourced. Externally, not all the population was technologically literate and there were different levels of knowhow.

There are still many people who do not know the technology and rarely access the internet and other media. To achieve full implementation, ICT systems and human capital must come together (Neirotti et al., 2014). A bottom-up approach should be undertaken to accelerate public acceptance and adoption of smart city implementation. Currently, Smartphone's are the most commonly used communication tool and should be used by the government to implement smart city program by providing various applications of smart city services, which can be accessed through Smartphone. The Office of

Communications and Information Technology (Bandung, 2016) also released several obstacles to implementation of BSC, as indicated in Figure 1.

Figure 1   The implementation barriers of BSC

Applications	Infrastructure	Governance
• Not yet supporting end-to-end business processes • Not all are operated	• Internet network/connection • Server availability	• Application operation management

Data	Human resources
• Multiple entry (multy data source) • Integration of data between units and SKPD (system work regional devices)	• Abilities/skills and numbers • Includes: system manager/admin and user (officer and citizen)

Alamanda et al. (2016) found 117 problems people complained to Ridwan Kamil's personal twitter (@RidwanKamil) from 16 September 2013–31 July 2015 relating to the smart environment. Meanwhile, Nadapdap et al. (2016) found that Bandung Teknopolis (part of the smart commerce program) and PPDP online (part of the smart education program) is the most frequently socialised BSC program by Ridwan Kamil through his personal twitter account. The Regional Development Planning Agency and the Office of Communications and Informatics discovered that smart government is most emphasised by the government. Integrated Service Center of Bandung also seeks to facilitate the licensing service through an application called 'Hay.U Bandung', but Arief and Alamanda (2016) found obstacles in the implementation.

Users were still having difficulty inputting data and attaching the required documents. In addition, Hay.U Bandung system must have accurate information to improve the effectiveness of the online licensing system. Free Wi-Fi access points are also still experiencing obstacles, which needs to be repaired by increasing the speed and stability of internet (Gustia, 2016). Cahyaningrum et al. (2016) found of the 15 of the entrepreneurship programs communicated through Ridwan Kamil's Twitter, only 73.3% of the programs have been executed and 87.5% of the programs are in accordance with the community needs. Based on existing information, Ridwan Kamil's Twitter account has not been distributed or shared properly.

According to the Indonesia Corruption Watch (ICW), Bandung ranked 16th in public integrity in 2012. The report also cited a variety of problems in the city, including congestion, water crisis, spatial irregularities, and urban forest lost. Almost 80 percent of Regional Revenue and Expenditure Budget are devoted to infrastructure development. After BSC was implemented, Bandung still stricken with common problems that often occur in urban areas, such as flooding. In addition, air quality is getting worse, especially during weekends due to the increased number of vehicles. 'Bike to work and bike to school' has been implemented to improve air pollution but this program has not been

maximised. Study conducted by Alamanda et al. (2017) found that smart transportation is one of the dimensions of smart city with a less clear concept. This is obvious from the high level of Bandung congestion. Based on data from SIEMENS (2016), some of the obstacles still faced by Bandung in implementing BSC is traffic congestion, waste management, park maintenance, unregistered businesses, flooding, physical infrastructure in the areas of energy and transportation, social infrastructure through schools, and better health care. Gunawan (2016) found that BSC still has some disadvantages, such as the mobile application Panic Button, which citizens try without an emergency and does not operate 24 hours a day as intended.

Currently, through the implementation of BSC, the City of Bandung is aggressively launching a government free complaint line (zero complaint government) to better manage public services. So far, feedback has shifted from complaints about public services, to the problems of infrastructure identified above. Ridwan Kamil has implemented several programs intended to support each priority sector evenly but this has remained somewhat of a challenge.

4.2 BSC as social innovation

Innovation in the public service sector is one form of social innovation that is becoming more effective in solving social problems in providing services to the public (Choi and Majumdar, 2015; Hubert, 2010; Mulgan et al., 2007). Based on Choi and Majumdar (2015), social innovation consists of three dimensions: formalisation, change process, and social outcomes. BSC combines technology with service to society. Social innovation encourages people, organisations, politicians, and policymakers to explore and implement new ideas to challenges, such as population growth, budget shortfalls, educational system quality, and the regeneration of socially and economically disadvantaged cities and regions (Harris and Albury, 2009). BSC seeks to address these issues with its priority programs. For example, smart governance enables people to monitor government budget allocations, smart communities provide for community development (i.e., Bandung Creative SmartHub), and impacts smart education (i.e., digital learning platforms).

According to Bekkers et al. (2013), environmental aspects, innovation process, and innovation adoption influence social innovation. In implementing BSC, environmental aspects such as social complexity, cultural characteristics, and resource allocation come into play. Thus, it is necessary to understand the innovation process as a learning process. Leadership in integral, Mayor Ridwan Kamil, the initiator of smart city, envisions Bandung as an integrated city of technology and public services where there is support and co-creation involving various stakeholders in developing BSCs. These include the academic, business, and community working side-by-side in risk management and innovation, ICT, and social media. Furthermore, successful innovation in the public sector also relies on diffusion, adoption, and innovation enhancement by other organisations. As of late, it seems to be working but not all understand the concept of BSC and utilise the BSC services. The Bandung Government must continuously educate the community. Attention to the process of diffusion and adoption of innovation in the public sector has been lacking and needs more attention (Greenhalgh et al., 2004).

Social innovation occurs because of actors collaborate by sharing resources and implementing new values, ideas or concepts to improve services (Kanter and Litow, 2009). Through this process, BSC is implemented and social innovation occurs. The

Bandung Government has demonstrated strong leadership by establishing comprehensive and formal strategies, centralised and decentralised institutional approaches to coordinate data and services (i.e., Bandung Command Center). Another example is the Twitter account by the Mayor that includes:

1   infobandung account – informed the latest news and events around Bandung

2   DiskominfoBdg account – communication and informatics department in Bandung

3   relawan_bdg volunteer activities

4   ClickBandung – latest news and events

5   bdg_juara account – weather, traffic and events

6   infobandung account – social information from all around Bandung

7   PemkotBandung Bandung City Government.

Integrated smart city planning, driven by a dedicated organisational team or cross-departmental team, builds smart city governance, especially in the early stages, while a more decentralised governance system may be more effective at the growth stage (Lee et al., 2014). The mayor set up a smart city board to better manage the growth of the Smart City initiatives.

In addition, BSC gets support from ITB which has smart city and community innovation centre (SCCIC) laboratory dedicated to research programs for the advancement of Bandung. ITB has a cooperative agreement (MoU) to support BSC development with Telkomsel. The Bandung Command Center has a collaborative agreement between Bandung Government, IBM, and Affiliation Institute of Industrial Research (LAPI) ITB. Support also comes from industry, where Huawei supports the program under the name SafeCity, which includes e-government, e-ticketing transportation, home with integrated technology, and other emergency services. According to Lee et al. (2014), Bandung has succeeded in forming public-private relationships that can develop sustainable systems, i.e., Code4Bandung focuses on promoting public and government collaboration to solve city problems by utilising information technology. Pizza data community that focuses on open data so that data can be accessed freely, especially public data. The community discusses problems in the city of Bandung and looked for practical solutions by utilising open data (Ardisasmita, 2015).

4.3   Conceptual framework of BSC as social innovation on public services sector

This study focuses on the empirical literature that addresses social innovation in the public sector. The dimensions used in analysing drivers and barriers in the public sector include innovation environment, process, and adoption (Bekkers et al., 2013). This conceptual framework can be used to analyse the implementation of BSC as a social innovation in the public sector. This research examines the conceptual model of BSC implementation within environmental aspect, innovation process, and adoption of innovation and social outcomes. According to Mulyaningsih et al. (2014), the stages of the social innovation process consist of: finding the social problem through assessment need, collaborative idea generating with the stakeholders, business feasibility and typical analysis for adjusting capacity, implementation collaboration with business partners, and

innovation for the social value. This study also identifies the stages of social innovation, following Mulyaningsih et al. (2014). The first stage identifies environmental aspects of BSC problems, where we identify drivers and barriers in the implementation of BSC. The next step in the innovation process consists of collaborative idea generation with the stakeholders, business feasibility and analysis for adjusting capacity, and implementation with key stakeholders. The lead roles are played by various parties involved in collaborative strategies aimed at achieving a radical level of innovation (Appio, 2013). INext, the innovation adoption and social outcomes consist of stages of the adoption process and social innovation value from the implementation of BSC.

Environmental characteristics are triggers for innovation while at the same time are a constraint (Bekkers et al., 2013). In this study we have found that environmental aspects serve as important innovative drivers and barriers, such as infrastructure, governance, coordination and socialisation, human resources, applications, data, and uneven implementation programs. This is in line with the research of Bekkers et al. (2013), which states that influential environmental aspects include the social and political complexity of the environment, the nature and level of legal culture in a country or policy sector, resource location, resource dependence, and quality of relationships within the network among the involved stakeholders.

The next aspect is the process of innovation is the environment. The innovation process in the implementation of BSC has involved various stakeholders, such as the establishment of smart city councils and the involvement of quadruple helix stakeholders (academic, business, government and community) in supporting BSC. Based on the identification of drivers and barriers in the implementation of BSC, an analysis of the innovation process includes: political climate that facilitates social innovation (i.e., policy, infrastructure), encourage stakeholder interest (i.e., socialisation, open thinking, relationships), support and co-creation of end-users, role of ICT and social media, improve skills, abilities, and competencies of human resources (i.e., government officials and the public). As Bekkers et al. (2013) identified, support and co-creation of end-users and the role of ICT and social media affects aspects of the innovation process.

Political climate is also an important factor (Mulyaningsih et al., 2014). Mulgan et al. (2007) identified four challenges of social innovation in creating permanent social change: efficiency (how institutions maintain innovation and understand existing capacity); stakeholder interest (how social innovation processes accommodate all interests or align interests to all parties); positive interpretations of stakeholders (perception of equality in overcoming the existing problems); and, relationships with all stakeholders that affect each other. In this study, we identified that stakeholder interest became one of the most important factors for success, so government entities should continuously socialise the public concerning the implementation of BSC, try to open the minds of stakeholders, and sectors involved, and establish good relationships with all stakeholders involved.

Successful innovation in the public sector relies on diffusion, adoption, and innovation improvement. Damanpour and Schneider (2008) argue that the process of innovation is based on the activities that generate innovation and the activities that adopt innovation. The implementation of the BSC has had an impact on the change process in social structures and practices that encourage social innovation. The process of social innovation usually causes changes in social relations, whereas social innovation induces power relations (Caulier-Grice et al., 2012). Pol and Ville (2009) see social innovation

output as resulting in improved quality of life quality as well as improved quantity. Other studies illustrate the dimension of social innovation proceeds to fulfil social needs or solving social problems (Fairweather, 1967; Mulgan et al., 2007; Murray et al., 2010; Phills et al., 2008). Based on this research, the innovation adoption process includes resource availability and allocation, learning and experimenting with process, and the pressure to look alike (Bekkers et al., 2013). Meanwhile, the expected social outcomes are public welfare, improved public services, sector wellbeing, and equity of technology and information.

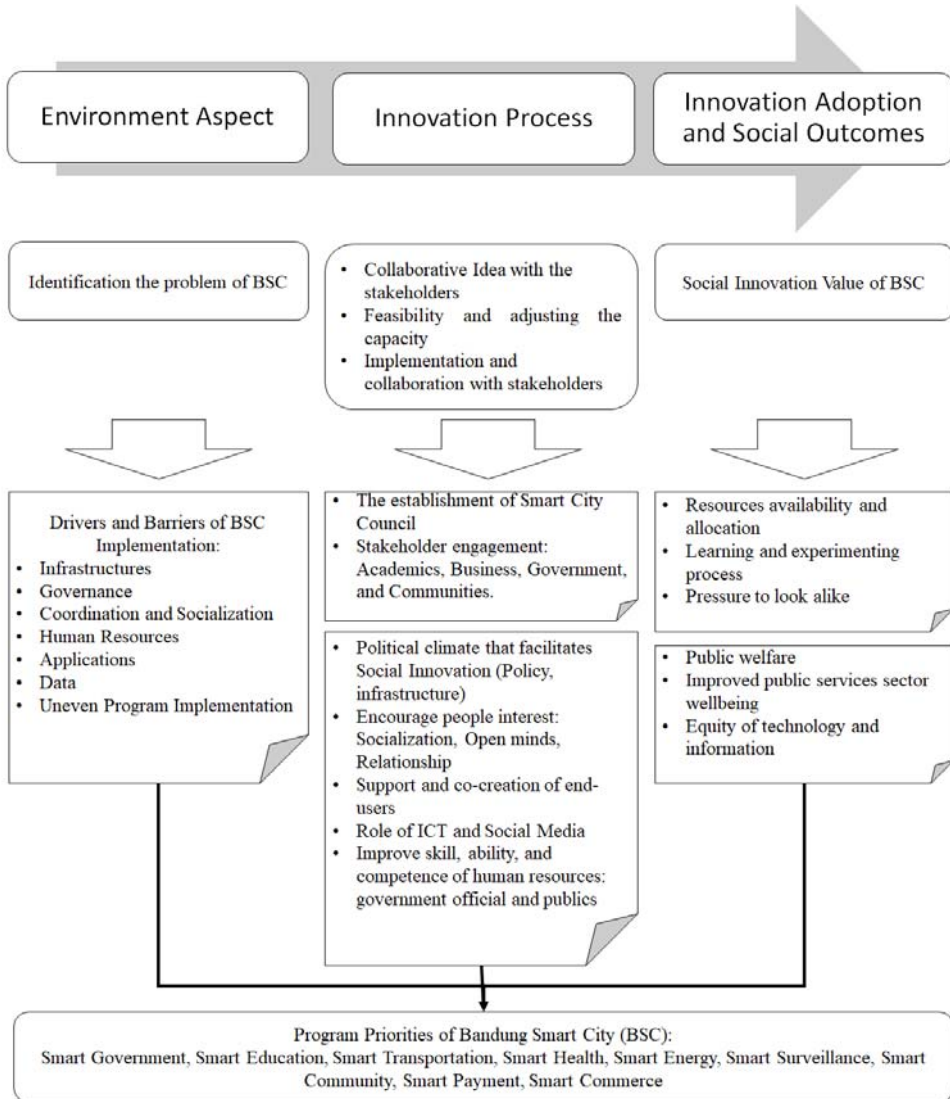**Figure 2**   Conceptual model of BSC implementation as social innovation in public services sector

Figure 2 is a conceptual mapping of the BSC implementation model as a social innovation in the public service sector based on problem identification and synthesis.

Conceptual mapping is based on three perspectives according to the conceptual framework proposed by Paroutis et al. (2014), namely strategy, technology, and systems in providing solutions to smart city implementation barriers.

5 Conclusions

This study evaluates the implementation of the smart city concept applied to a local government in Indonesia. BSC is an example of how to integrate the public-sector service process with network infrastructure and government structure. BSC has implemented the concept of smart city in various aspects of community services, although there are still shortcomings and barriers. Ten priority programs of BSC (smart government, smart energy, smart surveillance, smart environment, smart community, smart payment, and smart commerce) have been implemented in Bandung, although there is not even distribution on each program.

BSC is an example of social innovation through utilising ICT to provide public service. Social innovation in the public sector is an innovation that has an impact on the life and welfare of the community, especially in providing services related to the public interest. This study proposes a conceptual framework for BSC implementation. The BSC is a model for social development, which is needed to support social innovation across all sectors. The BSC system is predicted to be the premier model for the smart city network performance system as it ensures greater cooperation across sectors. BSC accelerates the innovation of independent information technology networks and the development of the digital economy and network-level improvements. The BSC new model provides real-time information, improves quality of life for individuals and the city as a whole.

The implementation of BSC still faces challenges in formulating institutional structures, due to internal and external resource-related constraints. The leader is very important in driving and controlling the implementation of smart city. The active participation of the community and the collaboration of various stakeholders (academic, business, and government) is strategically important to the development of BSC. Governments need to consider how to balance centralised and decentralised coordination/control mechanisms. Policymakers should be aware that every city must consider the local and regional culture in smart city design. In implementing the BSC, governments need to provide excellent network communication platforms, equitable distribution of infrastructure, and support 'genuine partnerships' among the sectors. This study shows that a comprehensive socialisation process is imperative in accelerating the acceptance of public service adoption and the importance of equity in program implementation.

6 Recommendations and future research

This paper contributes to a better understanding of the current smart city phenomenon and the development of technology implementation. The implications for policy makers in implementing a smart city include monitoring the ongoing progress of smart city implementation and be aware of drivers and barriers in developing incentives and measurement tools.

Future research could test the conceptual framework proposed. Further research could also explore other smart city implementation plans, measure success, and create benchmarking tools. More exploration of case studies related to smart city implementation will strengthen our understanding of how to develop effective smart cities and share best practices in smart city development.

References

Alamanda, D.T., Lastini, B.N., Khairunnisa, K. and Amani, H. (2016) 'Actor identification that affects Ridwan Kamil's work program for smart city using social network analysis', *IOSR Journal of Business and Management*, Vol. 18, No. 4, pp.48–53.

Alamanda, D.T., Prabowo, F.A., Agustina, S.E. and Yuldinawati, L. (2017) 'The roles of M2M technology on the realization of Bandung smart city', *Int. J. Business and Globalisation*, Vol. 21, No. 1, pp.46–73.

Amar, A.D. and Juneja, J.A. (2008) 'A descriptive model of innovation and creativity in organizations: a synthesis of research and practice', *Knowledge Managemnet Research & Practice*, Vol. 6, No. 4, pp.298–311.

Anggadwita, G. and Dhewanto, W. (2013) 'Service innovation in public sector: a case study on PT. Kereta Api Indonesia', *Journal of Social and Development Sciences*, Vol. 4, No. 7, pp.308–315.

Appio, F. (2013) *Radical Innovations: Indicators, Origins, and Processes*, Doctoral dissertation, PhD thesis, Scuola Superiore Sant'Anna, Italy.

Ardisasmita, A. (2015) *Langkah Bandung Dalam Mengimplementasikan Smart City* [online] https://id.techinasia.com/bandung-smart-city (accessed 9 October 2017).

Arief, M. and Alamanda, D.T. (2016) *Strategi Badan Pelayanan Dan Perizinan Terpadu Kota Bandung Dalam Mengefektifkan Hay*, Open Library Telkom University, Bandung, Indonesia.

Bandung (2016) *2016 International Conference on Information Technology Systems and Innovation (ICITSI)* [online] https://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=7842413 (accessed 9 October 2017).

Bekkers, V.J.J.M., Tummers, L.G. and Voorberg, W.H. (2013) *From Public Innovation to Social Innovation in the Public Sector: A Literature Review of Relevant Drivers and Barriers*, Erasmus University Rotterdam, Rotterdam.

Bovaird, T. (2004) 'Public–private partnerships: from contested concepts to prevalent practice', *Int. Review of Administrative Science*, Vol. 70, No. 2, pp.199–215.

Bungin, B. (2010) *Metode Penelitian*, Jakarta, IKAPI.

Cahyaningrum, Y., Alamanda, D.T., Prasetio, P.A. and Fitria, S.E. (2016) 'Study of entrepreneurship programs in Bandung based on Ridwan Kamil's Twitter account (@ridwankamil)', *IOSR Journal of Business and Management*, Vol. 18, No. 4, pp.76–80.

Caulier-Grice, J., Davies, A., Patrick, R. and Norman, W. (2012) 'Defining social innovation – a deliverable of the project: the theoretical, empirical and policy foundations for building social innovation in Europe (TEPSIE)', *European Commission–7th Framework Programme*, European Commission, DG Research, Brussels.

Center of Regional Science (2007) *Smart Cities Ranking of European Medium-Sized Cities*, Final Report 2007, Vienna UT, Vienna.

Central Statistics Agency Bandung (2016) *Kependudukan* [online] https://bandungkota.bps.go.id/Subjek/view/id/12#subjekViewTab3|accordion-daftar-subjek1 (accessed 9 October 2017).

Choi, N. and Majumdar, S. (2015) 'Social innovation: towards a conceptualisation', in *Technology and Innovation for Social Change*, Springer, India.

Cohen, B. (2014) *The Smart City Wheel* [online] https://www.smart-circle.org/smartcity/blog/boyd-cohen-the-smart-city-wheel/ (accessed 13 August 2018).

Damanpour, F. and Schneider, M. (2008) 'Characteristics of innovation and innovation adoption in public organizations: assessing the role of managers', *J. of Public Administration Research and Theory*, Vol. 19, No. 3, pp.495–522.

Dana, L-P. (2014) *Asian Models of Entrepreneurship –From the Indian Union and Nepal to the Japanese Archipelago: Context, Policy and Practice*, World Scientific, New York.

Dana, L-P. and Dana, T.E. (2005) 'Expanding the scope of methodologies used in entrepreneurship research', *International Journal of Entrepreneurship and Small Business*, Vol. 2, No. 1, pp.79–88.

Dana, L-P. and Dumez, H. (2015) 'Qualitative research revisited: epistemology of a comprehensive approach', *International Journal of Entrepreneurship and Small Business*, Vol. 26, No. 2, pp.154–170.

De Vries, H., Bekkers, V. and Tummers, L. (2016) 'Innovation in the public sector: a systematic review and future research agenda', *Public Administration*, Vol. 94, No. 1, pp.146–166.

Fairweather, G.W. (1967) *Methods for Experimental Social Innovation*, John Wiley & Sons Inc., Hoboken, NJ.

Ferreira, J.J., Fernandes, C.I. and Ratten, V. (2017) 'Entrepreneurship, innovation and competitiveness: what is the connection', *Int. J. of Business and Globalisation*, Vol. 18, No. 1, pp.73–95.

Goldenberg, M., Kamoji, W., Orton, L. and Williamson, M. (2009) 'Social innovation in Canada: an update', *Canadian Policy Research Networks*, Ottawa [online] http://www.sshrc-crsh.gc.ca/about-au_sujet/publications/social_innovation_report_E.pdf (accessed 1 October 2017).

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P. and Kyriakidou, O. (2004) 'Diffusion of innovations in service organizations: systematic review and recommendations', *The Milbank Quarterly*, Vol. 82, No. 4, pp.581–629.

Gunawan, W. (2016) *Konsep Bandung Smart City* [online] http://windagunawan96.blogspot.co.id/2016/06/konsep-bandung-smart-city-a.html?m=1 (accessed 9 October 2017).

Gustia, R. (2016) *Studi Persepsi Masyarakat Terhadap Program Wifi Bandung Juara* [online] https://repository.telkomuniversity.ac.id/home/catalog/id/114926/slug/studi-persepsi-masyarakat-terhadap-program-wifi-bandung-juara-berdasarkan-atribut-akses-internet.html (accessed 3 November 2017).

Guy, M.E. and Hitchcock, J.R. (2000) 'If apples were oranges: the public/nonprofit/business nexus in Peter Drucker's work', *J. of Management History*, Vol. 6, No. 1, pp.30–47.

Halvorsen, T., Hauknes, J., Miles, I. and Røste, R. (2005) *On the Differences Between Public and Private Sector Innovation* [online] http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan046809.pdf (accessed 8 September 2018).

Harris, M. and Albury, D. (2009) *The Innovation Imperative*, NESTA, London.

Hauser, C., Tappeiner, G. and Walde, J. (2007) 'The learning region: the impact of social capital and weak ties on innovation', *Regional Studies*, Vol. 41, No. 1, pp.75–88.

Herstad, J.S. and Ebersberger, B. (2014) 'Urban agglomerations, knowledge-intensive services and innovation: establishing the core connections', *Entrepreneurship & Regional Development*, Vol. 26, Nos. 3/4, pp.211–233.

Hubert, A. (2010) *Empowering People, Driving Change: Social Innovation in the European Union*, pp.9–10, Bureau of European Policy Advisors (BEPA) [online] http://ec.europa.eu/bepa/pdf/publications_pdf/social_innovation.pdf (accessed 12 October 2017).

Hulgård, L. (2010) *Discourses of Social Entrepreneurship: Variations of the Same Theme*, EMES Euro Res Net, Brussels

Jabareen, Y. (2009) 'Building a conceptual framework: philosophy, definitions, and procedure', *International Journal of Qualitative Methods*, Vol. 8, No. 4, pp.49–62.

Kadiman, K. (2008) *Simfoni Inovasi: Cita & Realita*, Foresight Asia, Jakarta.

Kamil, R. (2015) *Smart City Bdg*. [online] https://sustainabledevelopment.un.org/content/documents/12659kamil.pdf (accessed 9 October 2017).

Kanter, R. and Litow, S.S. (2009) *Informed and Interconnected: A Manifesto for Smarter Cities*, HBS Working Paper No. 09-141.

Langford, J. and Harrison, Y. (2001) 'Partnering for e-government: challenges for public administrators', *Canadian Public Administration*, Vol. 44, No. 4, pp.393–416.

Lee, J.H., Hancock, M.G. and Hu, M.C. (2014) 'Towards an effective framework for building smart cities: lessons from Seoul and San Francisco', *Technological Forecasting and Social Change*, Vol. 89, No. 1, pp.80–99.

Lekhi, R. (2007) *Public Service Innovation*, Work Foundation, London.

Lestari, N. (2016) *Bandung Smart City* [online] https://lestarinurbudi.wordpress.com/2016/06/08/bandung-smart-city/ (accessed 9 October 2017).

Mair, J. (2010) *Social Entrepreneurship: Taking Stock and Looking Ahead*, IESE Business School, University of Navara, Spain [online] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1729642 (accessed 9 October 2017).

Moleong, J. (2013) *Lexy, Metode Penelitian Kualitatif*, PT. Remaja Rosdakarya, Cet. Ke-31, Bandung.

Moore, M.H. (2005) 'Break-through innovations and continuous improvement: two different models of innovative processes in the public sector', *Public Money and Management*, Vol. 25, No. 1, pp.43–50.

Mulgan, G. (2006) 'The process of social innovation', *Innovations: Technology, Governance, Globalization*, Vol. 1, No. 2, pp.145–162.

Mulgan, G. and Albury, D. (2003) *Innovation in the Public Sector*, Cabinet Office Strategy Unit, United Kingdom Cabinet Office, London.

Mulgan, G., Tucker, S., Ali, R. and Sanders, B. (2007) *Social Innovation: What it is, Why it Matters and How it can be Accelerated*, Skoll Centre for Social Entrepreneurship, Oxford.

Mulyaningsih, H.D., Yudoko, G. and Rudito, B. (2014) 'Initial conceptual model of knowledge-based social innovation', *World Applied Sciences Journal*, Vol. 30, No. 1, pp.256–262.

Murray, R.., Caulier-Grice, J. and Mulgan, G. (2010) *The Open Book of Social Innovation*, Nesta [online] http://www.nesta.org.uk/library/documents/Social_Innovator_020310.pdf (accessed 9 October 2017).

Nadapdap, N.Y., Alamanda, D.T., Prabowo, F.S. and Ayuningtyas, H.G. (2016) 'Measuring the effectiveness of government communication on Bandung smart city', *IOSR Journal of Humanities and Social Science*, Vol. 21, No. 4, pp.72–79.

Neirotti, P., De Marco, A., Cagliano, A.C., Mangano, G. and Scorrano, F. (2014) 'Current trends in smart city initiatives: some stylised facts', *Cities*, Vol. 38, No. 1, pp.25–36.

OECD (2012) *Innovating The Public Sector: From Ideas To Impact* [online] http://www.oecd.org/innovating-the-public-sector/Background-report.pdf (accessed 9 October 2017).

Paroutis, S., Bennett, M. and Heracleous, L. (2014) 'A strategic view on smart city technology: the case of IBM smarter cities during a recession', *Technological Forecasting and Social Change*, Vol. 89, No. 1, pp.262–272.

Pengawasan, W. (2016) *Smart City Sebuah Kebutuhan* [online] https://www.kompasiana.com/karintavika/579b3d4e747a617731f2fff3/smart-city-sebuah-pilihan-atau-kebutuhan?page=all (accessed 5 October 2017).

Permatasari, A. and Dhewanto, W. (2013) 'Business model innovation towards competitive advantage: case study in Indonesian cosmetics and herbal health companies', *Information Management and Business Review*, Vol. 5, No. 8, pp.385–408.

Phills, J.A., Deiglmeier, K. and Miller, D.T. (2008) 'Rediscovering social innovation', *Stanford Social Innovation Review*, Vol. 6, No. 4, pp.34–43.

Pierre, J. and Peters, G.B. (2000) *Governance, Politics and the State*, Macmillan, Basingstoke.

Pol, E. and Ville, S. (2009) 'Social innovation: buzz word or enduring term?', *The Journal of Socio-Economics*, Vol. 38, No. 6, pp.878–885.

Pollitt, C. and Hupe, P. (2011) 'Talking about government: the role of magic concepts', *Public Management Review*, Vol. 13, No. 5, pp.641–658.

Ramadani, V., Abazi-Alili, H., Dana, L.P, Rerxhepi, G. and Ibraimi, S. (2017) 'The impact of knowledge spillovers and innovation on firm-performance: findings from the Balkans countries', *International Entrepreneurship and Management Journal*, Vol. 13, No. 1, pp.299–325.

Ratten, V. (2017) *Entrepreneurship, Innovation and Smart Cities*, Routledge, UK.

Ratten, V., Ferreira, J.J. and Fernandes, C.I. (2017) 'Innovation management-current trends and future directions', *International Journal of Innovation and Learning*, Vol. 22, No. 2, pp.135–155

Rogers, E.M. (2003) *Diffusion of York*, The Free Press Simon Innovation, New York.

Rutten, R. (2005) *Knowledge and Innovation in Regional Industry: An Entrepreneurial Coalition*, Routledge, London.

Schoeman, M., Baxter, D., Goffin, K. and Micheli, P. (2012) 'Commercialization partnerships as an enabler of UK public sector innovation: the perfect match?', *Public Money & Management*, Vol. 32, No. 6, pp.425–432.

Schumpeter, J.A. (1942) *Creative Destruction, Capitalism, Socialism and Democracy*, Harper and Brothers, New York.

SIEMENS (2016) *Bandung Smart City – Peran Teknologi. PT Siements Indonesia*, Jakarta, Indonesia.

Stoker, G. (1998) 'Governance as theory: five propositions', *International Social Science Journal*, Vol. 50, No. 155, pp.17–28.

Suwarno, Y. (2008) *Inovasi di Sektor Publik*, STIA-LAN, Jakarta.

Taylor, S.J. and Bogdan, R. (1984) *Introduction to Qualitative Research Methods: The Search for Meanings*, Wiley, New York.