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Title of Paper: Conceptualizing Collaborative and Data-Driven Innovation Platform for Public Service

Good Governance or Open Government Sub-Theme of Paper: Emerging Issues and Conceptual Frameworks in Public Administration and Good Governance

Abstract:

As Drejer (2004) argues, many of the claimed peculiarities of service innovation, such as presence of organizational innovation, involvement of multiple actors in the process of innovation and the importance of codification of knowledge for carrying out innovation, also apply to other fields. This is therefore a search for a common model, including both technological and non-technological innovation to enable an integrative approach on innovation in public services.

In conceptualizing this model, four dimensions of the six-dimensional model of innovation on services of Den Hertog (2010) shall be adopted to explore whether pairing government with civic experts, academics and citizens, through innovation experiments in building public services that citizens will use may lead to an replicable model of self-reinforcing and sustained technology-led Collaborative and Data-Driven Innovation Platform.

Conceptualizing Collaborative and Data-Driven Innovation Platform for New Public Service

Introduction

Open collaboration has evolved as a new venue for innovation creation in the public sector. Government organizations are using online platforms to crowdsource and co-produce public sector innovations with the help of external and internal problem solvers (Mergel 2014, p. 1). Initiatives like the Open Government Partnership has 69 participating countries which have made over 2,250 commitments to make their governments more open and accountable. (Open Government Partnership). Singapore ushers in a new era where the Government aims to shift from a "government-to-you" approach to a "government-with-you" approach in the delivery of government electronic services (eGov 2015, p. 2). Collaboration has also been applied in Japan which was awarded a United Nations 2010 category 3 - 1st place win for Innovations in Public Governance, the "Collaboration Testing" of the Saga Prefectural Government Japan (UNPSA mobile app). Collaboration can also come from the academe. The Habit@ project grew out of a course led by Harvard Professors Susan Crawford and Michael Hooper. It it students from the Kennedy School and the Graduate School of Design engaged in co-design with several community organizations in Boston's Roxbury and Dorchester Neighborhoods to create civic tools. Several tools were conceived of during the course, and a few were actually created and implemented. (Philippi 2016)

In the Philippines, being one of the eight founding states of the Open Government Partnership, the government through its data.gov.ph declared that *'Public participation and collaboration will be key to the success of any open data initiative. An open policy of encouraging citizens and businesses to engage in this manner multiplies possibilities and opens up a world of innovation'* *(data.gov.ph)*. With this premise, the the Philippine government encourages the public to develop and upload mobile applications that uses government data.

Government data sets made available vary from Local Government, Economy, Environment, Geospatial, Public Finance, Agriculture, Transport and Communication, Population, Employment, Social Welfare, Health, Education, Politics, Law and Justice, Infrastructure, Cultural, and Energy. Out of these voluminous data, only nine (9) mobile applications related to this open data initiative have been developed. Two (2) are budget appropriations related: Budget Barger and Budget Booth; six (6) on transportation: Rklamo, transit.com.ph, Sakay.ph, Manila Train Guide, Trip Barker, and Taksilog; and one (1) on education: checkmyschool (data.gov.ph).

Data.gov.ph presents complex governance challenges to the Philippines. Data.gov.ph is a system that demands collaborative and open governance. The release of data from government agencies and the use of these data to develop government applications by the private sector represents an emerging governance alternative to the traditional bureaucratic approaches to the delivery of public services. Public Interest in open collaboration is fairly recent, but the development of mobile civic applications has more impact than what its seems. There is a need to understand the innovation ecosystem involved in these open collaboration platforms.

This paper proposes to design an innovation experiment to measure the efficiency of collaboration between government with civic experts, academics and citizens in creating mobile civic tools that citizens will use. The innovation experiment will be used within the context of a civic technology innovation in public service domains that may lead to an replicable model of self-reinforcing and sustained technology-led Collaborative and Data-Driven Innovation Platform.

The main question that this paper would like to address is: How to design an innovation experiment that will measure how collaboration between government with civic experts, academics and citizens may shape innovation outcomes and produce new public services and civic tools?

Theoretical Background

Authors have discussed collaborative governance in many dimensions. Donahue (2004) defined collaborative governance according to categories: Formality, Duration, Focus, Institutional Diversity, Valence, Stability vs Volatility, Initiative and Problem-Driven vs Opportunity Driven. Donahue (2004) further asserted that the kinds of work to be done on collaborative governance should be conceptual, empirical, evaluative and operational.

Conceptual. As governments outsource their services, it could become easier to collaborate because public and nonprofit institutions are already accustomed to working together. The "hollow state" often becomes the "collaborative state," albeit with the same concerns about capacity and control (Agranoff 2005; Milward and Provan 2000 as cited in Gazley, 2008, p. 42)

Empirical. Santos et. al. (2015) verified the statistical validity of a collaborative public sector innovation model in the Brazilian Federal Government context. Their model essentially addresses aspects of co-creation, public sector innovation, and innovation ecosystem. Structural Equation Modeling results show a good model fit. It is concluded that the creative collaborative processes (co-creation) may generate new public values and foster public sector innovation. This stimulates the development of an innovation ecosystem supported by new public values and co-creative dynamics. (Santos, 2015 p. 1)

Evaluative. A driving force behind the increased use of collaboration has been the dramatic evolution of information technology. The advent of inexpensive instant means of communication has reduced the transaction costs of collaborating. Moreover, this web of communication has contributed to the accelerated integration of collaborative structures across national boundaries known as globalization. Hierarchy continues to be the most common way to organize the public's work. Moreover, there has always been some collaboration across sectors to achieve policy goals. The significant and accelerating change is in the extent of collaboration in public management. (Bingham, et. al. 2008, p. 6)

Operational. Collaborative Democracy according to Noveck (2009) - is a new vision of governance in the digital age. It is overdue to rethink the legitimacy of attenuated participation in a small number of representative institutions. Instead, democratic theory and

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the design of governing institutions must be rethought for the age of networks. The opportunity now is to move toward collaborative democracy, in which institutions afford the public the opportunity to select themselves to participate actively in diverse ways. (Noveck 2009, p. 16)

This Collaborative democracy is a new approach for using technology to improve outcomes by soliciting *expertise* (in which expertise is defined broadly to include both scientific knowledge and popular experience) from self-selected peers working together in groups in open networks. By lending their expertise and enthusiasm, volunteer experts can augment the know-how of full-time professionals and coordinate their own strategies. By taking advantage of technology's cost savings, hierarchies can be transformed into collaborative ecosystems and radically change the culture of government from one centralized expertise to one in which the public and private sector -organizations and individuals - solve social problems collectively. (Noveck 2009, p. 16)

Open government data is at the heart of this change that is taking place in governments. Since the inception of the internet, and its increasingly central role in how governments deliver services and information to citizens and businesses, governments have used data as an input into a finished "product", i.e. a service delivered to users (O'Reilly, 2013 as cited in OECD). Government Data made available as open/liquid data are now provided to non-institutional actors who can use them to develop innovative and valuable new solutions, this directly contributing to public sector innovation. This is a new form of open and collective public sector innovation. Hence, the data become the "platform" to be used to encourage the development of new useful applications and solutions. (OECD, p. 2)

Open innovation in civic technologies should achieve open and collaborative governance. Online and digital technologies that enable citizens to hold governments to account, known as **civic technologies**, are proliferating at a steady rate around the world. The potential for these platforms to invigorate citizen engagement, increase transparency, and broaden public debate has been recognised not only by those in civil society, but by governments, by development agencies, and by philanthropists. (Rumbul 2015, p. 1)

The rise of civic technology in this new millennium has been organic and profound. It has not been led by politicians or corporations, nor by powerful knowledge-rich institutions or NGOs, but by individuals and loosely constituted groups with specific digital expertise and an interest in getting things done. Such individuals are not normally considered to be on the cutting edge of political and practical behaviour change. Across the world, small pockets of coders and developers have independently, and occasionally with a little peer support, created a range of online platforms to help citizens like themselves get government working for them in one small way or another. (Rumbul 2015, p. 2)

The digital seeds of this civic technology have now grown and begun to cross-pollinate. Isolated pockets of digital civic innovation are now connected to each other and to a range of organisations that can support and champion their efforts. Large foundations and trusts have provided funding to this emerging sector where more traditional NGO funders previously did not dare to tread, and many governments and supranational initiatives are now recognising the value of digital civic engagement. There is now wide recognition that such civic technology innovations are 'a good thing'. (Rumbul 2015, p. 2)

Literature Review

Interest in open government has increased rapidly and the need to innovate in how we solve problems is now well understood at all levels of decision-making: local, state, national and international. Despite the growth in innovation efforts little is known about what works and why. To address these knowledge deficits, the MacArthur Foundation Research Network on Opening Governance efforts are focused on the questions found in its common Research Agenda, organized around two central hypotheses:

- **Collaborative Innovation** – When institutions open themselves to diverse participation and better coordinate efforts with other stakeholders, governing decisions are more effective and legitimate.
- **Data-Driven Innovation** – When governing institutions leverage data to inform decision-making they are more legitimate and effective, and when institutions open data to the public, new public value is created. (Young 2016)

The Network's efforts to test its hypothesis and move closer to achieving its goals are built around agile and empirical experiments with institutional partners such as governments and NGOs. Experiments are designed to apply and test the latest advances in technology as well as new scientific insights on collaboration and decision-making to improve real world decision-making in the public interest. This action research is complemented by theoretical writing and compelling storytelling designed to articulate and demonstrate clearly and concretely how we might govern better than we do today. (http://www.opening-governance.org/#the-opportunity)

One of the open innovation strategies of Saebi and Foss (2014) is collaborative open business model. As to content, this model results in radical innovations and opening up of new target segment. In this model users / suppliers / customers / competitors become key partner in innovation process. As to governance, this model is contract based, sharing of rewards on organizational level with external knowledge provider and provides incentives for own employees to engage with lead users and alliance partners.

Attempts to improve participation in civic life often focus on increasing the number of citizens engaged rather than improving the quality of engagement. As digital interventions flood the civic space, investigating the mediating interfaces that provide opportunities for deeper engagement becomes necessary. Gordon of Harvard University and Baldwin Philippi of Emerson College (2014) engages in design based research that assesses the affordances and effects of one such platform: an interactive online game for local engagement called Community PlanIt (CPI). Drawing on an analysis of game mechanics, in-game actions, and interviews and focus groups with players, (Gordon) ask if and how CPI can move citizen participation beyond isolated transactions. (Gordon) draws two conclusions: CPI creates and

strengthens trust among individuals and local community groups that is linked to confidence in the process of engaging, and it encourages interactive practices of engagement that we define as civic learning. (Gordon, 2014, p 1)

Gray, Lämmerhirt and Bounegru (2016) conducted case studies on how citizens and civil society groups can generate data as a means to influence institutional data collection. Gray, Lämmerhirt and Bounegru (2016) profiled citizen-generated and civil society data projects and how they have been used as advocacy instruments to change institutional data collection – including looking at the strategies, methods, technologies and resources that have been mobilised to this end. Gray, Lämmerhirt and Bounegru (2016) concluded with a series of recommendations for civil society groups, public institutions, policy-makers and funders. The case studies were based on qualitative, semi-structured interviews with people who have been directly involved with the projects. Potential case studies were shortlisted through snowball sampling drawing on a combination of interviews and digital methods (Gray 2016, p. 7)

Current approaches to encouraging the creation of services based on data, and an analysis of the creation of services from two open data platforms, in the UK and in Singapore were explored by Foulonneau, Turki, Vidou and Martin (2014). They explored the roles that the (open) data can have in the design of services based on a theoretical framework of service innovation. Data can play different roles: (i) the service is based on data, (2) the service uses data as a resource, and (3) the service is validated or enriched with data but the data is not directly used or is not directly visible in the service. This offers new opportunities for the reuse of data and suggests a different approach to measuring the impact of opening datasets beyond the mere number of services created. (Foulonneau, 2014, p. 1)

Nowadays, involving citizens in Local Environmental Governance (LEG) is becoming increasingly important. In order to empower the role of citizen in this context, Reiter (2014) proposed an approach that relies on the establishment of a physical and intellectual space for shared understanding and collaboration between all stakeholders impacted by an environmental problem (in our case odour emission). Based on the development of an Information Technology (IT) system allowing odour emission

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measurement as well as the collection of citizen feedback, a Living Lab (LL) approach is being implemented that involves citizens, public authorities, industry and environmental non-governmental organisations (NGOs). According to the definition of the European commission, Living Labs are "open innovation environments in real-life settings, in which user-driven innovation is fully integrated within the co-creation process of new services, products and societal infrastructures". Based on this definition and considering, citizens as one of the end-users of the IT system, Reiter (2014) argue that such an approach will empower their role in local environmental governance. Reiter's (2014) article presents the method and techniques that will be used in order to set up such a Living Lab. More precisely, Reiter's focus here on the first step of this method: defining the components that will support the management of a Living Lab relying on an IT system. This step consists in the identification of the Living Lab stakeholders (citizen, industry, public authorities, NGOs, etc.), including their characteristics, fears, expectations, involvement and engagement regarding the Living Lab. To do this, 2 main approaches are being combined: A Living Lab approach that aims to involve citizens in local Environmental Governance (LEG) design. Use of Human-Centred Design (HCD), to combine IT developments and LL needs, for example Personas methodology and usability test. A Living Lab relies mainly on stakeholders' involvement in order to build trust and establish a common goal. In this sense, sociologists' approaches ((Akrich et al. 2006);) bring valuable information on how to mobilise different actors in order to innovate (Actor Network Theory). However, in the innovation process, these approaches are only considering human actors and do not take into account any technological aspects. However, if Living Labs are relying on human actors' interactions it should also take into account their interactions with the IT system it is based on. In this case, Human-Centred Design (HCD) being an approach that aims to make IT systems usable and useful by focusing on the users, their needs and requirements, is to be considered as complementary to the sociologists approaches. Reiter's article, based on the work performed in the FP7 European project OMNISCIENTIS, presents the theoretical context in which this study takes place as well as the overall methodology. (Reiter 2014, p. 1)

The OECD has created its own set of indicators, based on its methodology and structured around the G8 Open Data Charter. As a first step in producing a comprehensive measure of the level of implementation of the G8 Open Data Charter, the OECD pilot Index

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on Open government data assesses governments' efforts to implement open data in three dimensions: 1. Data availability on the national portal (based on principle 1 and collective action 2); 2. Data accessibility on the national portal (based on principle 3) and 3. Governments' support to innovative re-use and stakeholder engagement (principle 5). The only principle not covered in this year's index is Principle 4: Releasing Data for improved governance value (e.g. transparency) as existing measurement efforts have focused primarily on socio economic value creation. In the future, the OECD will further extend this indicator and create other indicators to recognise all of the potential benefits of open data, including the economic, social and good governance aspects. (2014 OECD Survey on Open Government Data; OECD Government at a Glance 2015)

The OECD OURdata Index aims to help strengthening governments' focus on impact and to remember that the overall objective should not be on increasing data availability, but on actively fostering stakeholders' engagement in data reuse. The OURdata Index is based on the OECD methodology for measuring Open Government Data (Ubaldi, 2013) and on the G8 Open Data Charter, encapsulating the first set of internationally agreed-upon set of principles on Open Data. This is essential, as the OURdata Index is also intended to help governments monitor their progress in implementing their international OGD commitments. Ultimately, the OURdata Index aims to support governments in designing and implementing OGD strategies that deliver value to the public (OECD, p. 3).

Conceptual Framework

As Drejer (2004) argues, many of the claimed peculiarities of service innovation, such as presence of organizational innovation, involvement of multiple actors in the process of innovation and the importance of codification of knowledge for carrying out innovation, also apply to other fields. This is therefore a search for a common model, including both technological and non-technological innovation to enable an integrative approach on innovation in public services.

By allowing external actors to reuse government data and tools, new services can be provided to citizens and by citizens (e.g., Nam, 2012; Linders, 2012). In this way, the government can be turned into a powerful "platform" also involving innovators (e.g.,

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O'Reilly, 2011). At the same time, by using common open repositories, public administrations can save time and money from the automatisation of internal data exchange, while increasing their degree of transparency (Stiglitz et al., 2000). (Lemma et. al. 2014)

In conceptualizing this model, four dimensions of the six-dimensional model of innovation on services of Den Hertog (2010) shall be adopted to explore whether pairing government with civic experts, academics and citizens, through innovation experiments in building civic tools that citizens will use may lead to a replicable model of self-reinforcing and sustained technology-led Collaborative and Data-Driven Innovation Platform. A service innovation is a new service experience or service solution that consists of one or several of the following dimensions: new service concept, new customer interaction, new value system/business partners, new revenue model, new organizational or technological service delivery system (den Hertog, van der Aa & de Jong, 2010).
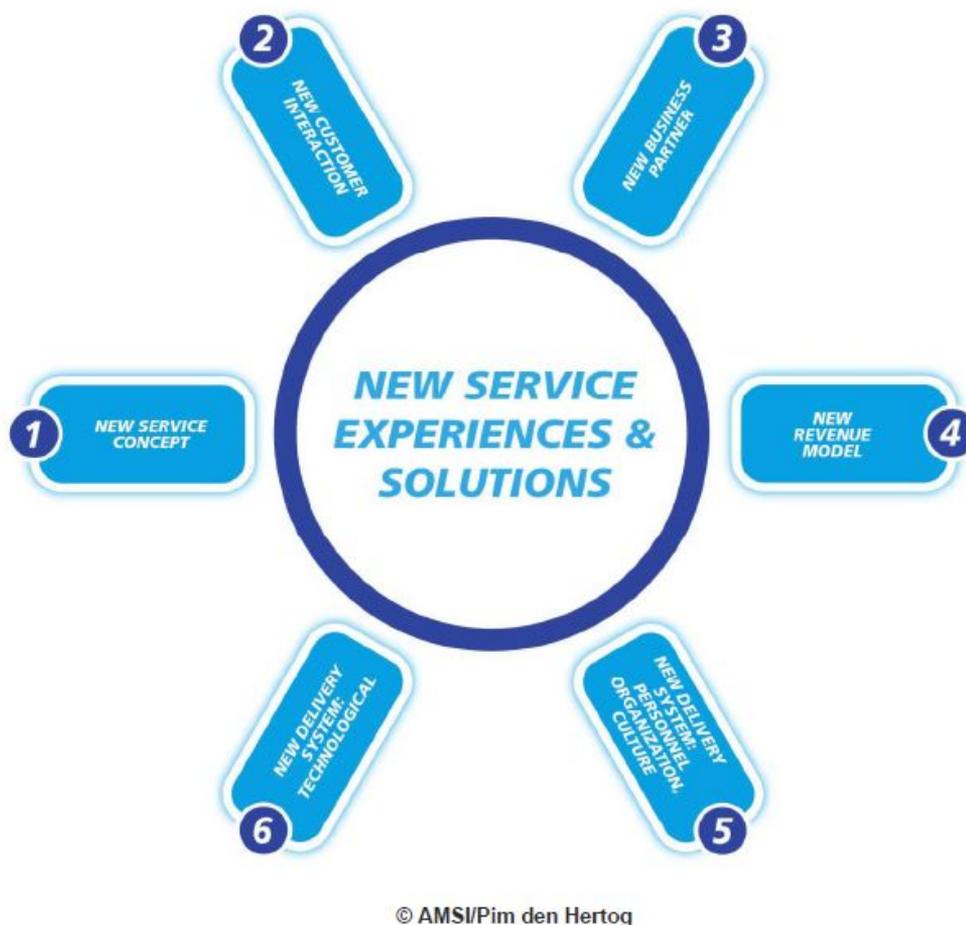

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Figure 1. Six dimensional model of service innovation

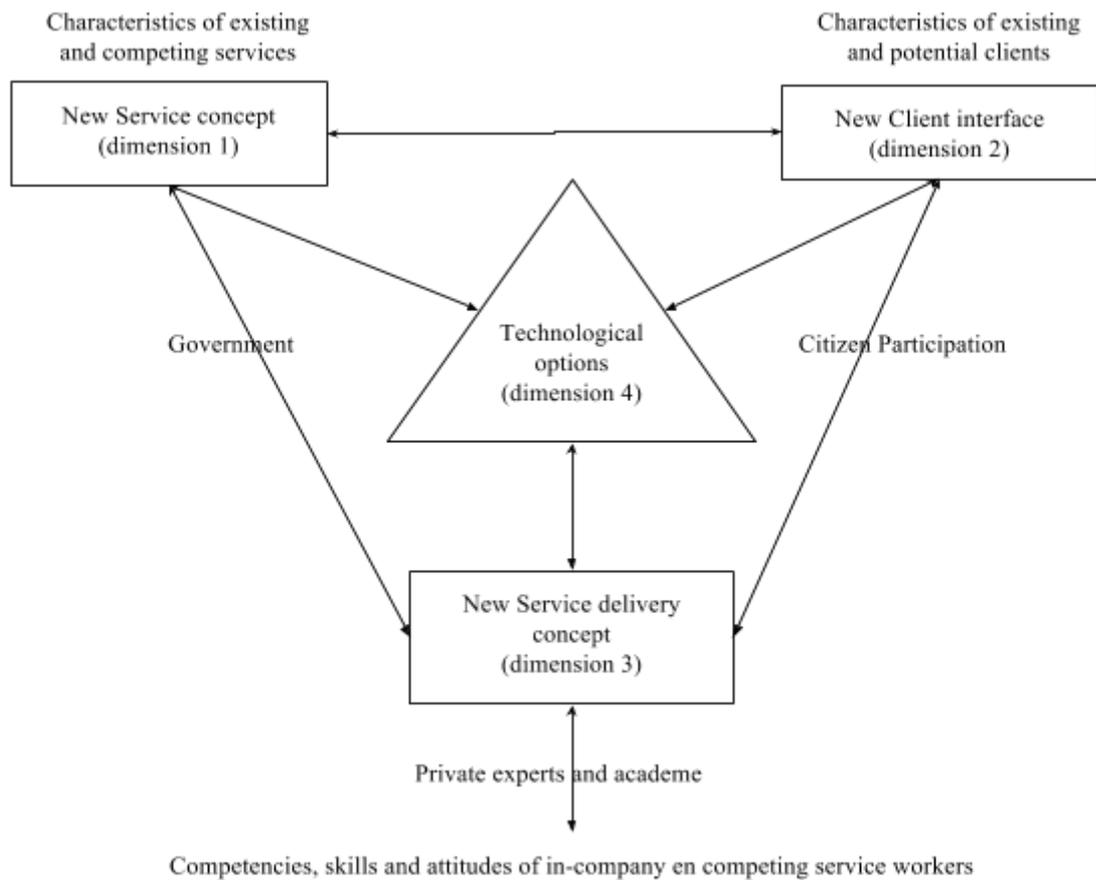*Conceptualizing Collaborative & Data-Driven Innovation Platform for PS*

Figure 2. A four-dimensional model of innovation on public services, adopted from Den Hertog (2000)

Innovations in services normally have both technological and non-technological dimensions, which tend to be interdependent. The technological dimension (dimension 4) The first non-technological dimension (dimension 1) is the introduction of a new service concept. In the services, new concepts mostly refer to gradual innovations based on a combination of old and new applications. The second non-technological innovation (dimension 2) is the creation of a new client interface. The service delivery concept (dimension 3) involves new ways of delivering services (den Hertog).

Method of Operationalization

Experimental approaches have by now gained the most substantial ground in sub-disciplines including behavioral, developmental and labor economics (Bandiera et al. 2011, List 2009, 2011 as cited in Boudreau and Lakhani 2015, p. 2). By contrast, the economics of innovation literature has generally lagged behind in adopting an experimental approach (Boudreau and Lakhani 2015, p. 2).

There is the Crowd Innovation Laboratory at Harvard University's Institute for Quantitative Social Science. This program represents an early first step towards bringing the field experimental research method to the economics of innovation literature. The particular focus area of the Laboratory has been the design of innovation contests and tournaments, such that real-life technological problems are addressed while manipulating and measuring features of the innovation process (Boudreau and Lakhani 2015, p. 3).

Contest

- Define the problem
- Develop criteria for evaluation
- Set Prize
- Attract Solvers
- Test Solutions
- Pay for Performance

Objective: Development of mobile civic tools

Experiment: Generate and evaluate collaborative solver participation in development of mobile civic tools

Two week long competition - Php x x x prize pot

Contest results should show value outcomes such as, co-creation experience, different approaches, minimum viable civic tool, number of users.

Table 1. Indicators for benchmarking:

Public values	Indicator	Data Source
Efficiency	Speed in developing Minimum Viable Civic Tool embodying the four dimensions: 1. new service concept, 2. creation of a new client interface, 3. service delivery concept, and 4. technological	Time and Motion Third Party Assessment
Democracy	Co-creation participation Data gathering from citizens	Peer review FGD Third Party Assessment
Effectiveness	Use	Back-end software count Satisfaction Survey Third Party Assessment

Conclusions and Further Research

The main question of this paper was: How to design an innovation experiment that will measure how collaboration between government with civic experts, academics and citizens may shape innovation outcomes and produce new public services and civic tools? We explored the concept of collaborative and open governance and the use of collaborative open innovation by considering theoretical suggestions and empirical approaches in recent researches. Four dimensions of open innovation that are important to investigate: new service concept, creation of a new client interface, service delivery concept and technological dimension. The result is an innovation experiment using field experimental research method in the form of innovation contest and tournament.

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Websites and Mobile Apps

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Info-communications Development Authority of Singapore.
https://www.ida.gov.sg/Programmes-Partnership/Sectors/Government

MIT GOV/LAB. Govlab.org

Public Administration and Development Management. Department of Economic and Social
Affairs, United Nations. Public Nomination Profile for eCitizen of Singapore.
https://publicadministration.un.org/unpsa/Public_NominationProfilev2014.aspx?id=3
097

Open Government Partnership. http://www.opengovpartnership.org/

United Nations Public Service Awards mobile app