A SMART CITY APPLICATION VALUE PROPOSITION REALITY CHECK AND CHALLENGES: THE CASE OF MOBILE APPLICATION FOR LOCAL TAX INFORMATION AND PAYMENT

Brillyanes Sanawiri[1], Rosalita Rachma Agusti[2]

[1,2]Faculty of Administrative Sciences, Universitas Brawijaya

ABSTRACT

This paper address the problem and challenges of the smart city application in the field of tax service. The smart city application for local tax information and payment or namely the SAMPADE App is an innovative service provided by the city government of Malang, Indonesia. The four elements of value proposition and seven smart city framework dimensions were employed to evaluate the Smart City app of SAMPADE. A qualitative study was used by interviewing users and stakeholders of the mobile application. The study indicate that all four elements of the value proposition were currently perceived useful, however improving the performance and reliability of the apps requires further developments. The main contribution of this paper is the qualitative dimension of the concept of the value proposition and the smart city framework used to evaluate the smart city app. Future challenges and recommendation are also presented in this paper as part of the broader exercise for policymakers in developing the smart city app for local tax information and payment.

Keywords: Value Proposition, Smart City, Local Tax, E-Government

INTRODUCTION

As urban life becoming increasingly a popular area to live, various stakeholder are using ICT and mobile telecommunications advancement in offering services that are custom-fit to life in the urban environment. Cities and local governments are exploring the opportunities of ICT services and products in increasing the quality of life of their citizens. Over recent years, this proposition is often portray in the 'Smart City' concept. The concept of smart city has increasingly being discussed by academia, practitioners and policy makers in exploring the role of technology within enhancing urban life. One area in the smart city application field that is currently being explored and integrated together with technology is the tax service for citizen in urban Indonesia. After the implementation of the regional autonomy law in Indonesia, the regional government has the opportunity to autonomously create its economic development through its potential economic resource in their territory (Kadir et al., 2018).

The Rural and Urban Land and Building Tax of Indonesia is one of the central taxes that has been delegated to local governments. Referring to the regulation of delegation of authority in tax management in accordance with Law number 28 of 2009 concerning regional taxes, the City Government of Malang has implemented the management and collection of its land and building tax or namely PBB-P2 since 2013. The delegation of authority for the management of PBB-P2 is an advantage for the local city government in the ability to maximize its source of income. However, in order for the local government to increase its potential income, they must improve their public services. An example effort that can be employed by the local government is through service innovation using information and communication technology (ICT) in public services. In the context of e-government, electronic services are associated with intangible goods such as the exchange of information for permits, payments, and tax registrations. A recent form of e-services in the context of e-government is the online of tax systems. The online tax system is developed for the transmission of tax information from tax administrator through the usage of internet via web service or mobile apps. SAMPADE was created by the local government of Malang as one of the city app which

connect tax payers with information and other services directly to local tax administrator in the city of Malang.

SAMPADE smart city app was created in 2018, as a part of the innovative initiative of the local city government to increase tax services. Although the app is relatively new, it is worth investigating how the app is perceived by its users and stakeholders. In contextualizing the smart city app in the minds of the customer or users, the value proposition is a concept that can be used to investigate the aspiring perception of the app user. Value proposition previously has been discussed in various field including marketing research (Ballantyne et al., 2011), information and technology service (Maglio & Spohrer, 2013) and e-government (Chatfield & Hujran, 2007), however from a smart city perspective and tax service remains limited.

The concept of Smart City and Smart City App

Smart city is idealistic vision of a city that enables wealth, sustainability, and well-being through the advancement of technology in solving most of the sophisticated problems (Greenfield, 2013). The vision of the smart city for recent years has become an attractive concept for many policymakers, but more studies is needed to understand the integration between technology and urban governance (Meijer et al., 2015). In understanding the contextual condition of smart city and the values proposed by smart city apps this study will attempt to look closer at mobile service as a significant part of the smart city. For recent years, mobile service plays an important role in modern life following the business and technology platform provided by Apple and Google. These innovative mobile software distribution platforms allowed developers to introduce applications for various services that enhance life in many ways. As smartphones become more affordable and popular, societies across the globe depend on innovative mobile devices and services as their important daily tools in life in the city. The smartphone is the primary interface object which facilitates these innovative services and 'smarter' way of life (Townsend, 2013; Greenfield, 2013). Still, the concept of smart city does not solely mean that mobile apps will be the only solution for the future, however, 'mobile apps is an important and close proxy of what we could image a future-facing city would offer' (Walravens, 2015). Furthermore, looking at the mobile industry from the perspective of

the Smart City, there are various important trends and issues arising. Firstly, infrastructure and the evolutions in networking technology, how smartphones or mobile devices connect to the network. The trend of cities aiming to offer different wireless coverage (using e.g WiFi or WiMAX) to its citizen for free or by commercial WiFi projects offered by telecommunication operators, yet it is well recognized that the most common networks like 3G and 4G (LTE) considered being the most popular around the world. Secondly, another important trend impacting the development of mobile services in the city context is related to open data. Many city governments hold data and information from many different aspects of life, yet this valuable data and information is either not publicly available or not easily interpretable (OKFN, 2012). As a result, the openness of data is now being promoted worldwide which inspires the birth of various events and competitions like Hackathons or Developers Day Apps for X. These events are designed to stimulate developers to create innovative solutions or new services base on this new source of data. Although various technical issues remain (technology or technical readiness, standardization, and interoperability of the datasets), however, these initiatives are increasingly become successful and produce compelling initial results. The third trend which is an important aspect of the mobile industry is both technological and business platforming (Gawer & Cusumano, 2002; Gawer, 2010; Cooke, et al., 2010). This is a combination of hardware and or software integration that creates an attractive value proposition for developers, content providers and end-users (Gawer, 2010). These led to a very competitive industry in which creates a very difficult platform for government or cities to compete with. Fourth trend is the changing role of the user within the value network or system. Through the democratization of ICTs increases the possibilities of end users (citizen or user of the app) to be more aspirational about issues that are important in their surrounding or context (Shepard & Simeti, 2013). Therefore, this led to new service that facilitate both citizen and government in their communication. As a result, the user perspective in developing these smart tools and applications is essential (e.g co-creation). These different trends helps in supporting the operationalisation of the smart city concept which will be used in this study. The case of SAMPADE as a smart city app needs to be investigated whether the innovative intentions of the providers of the smart

city app for tax engages with the value that is perceived by the citizen or user of the apps. In addition, the implementation of the smart city project can also be reviewed using the smart city framework (Berst, 2014). The smart city framework consist of 7 elements of technology enablers (provided by Smart Cities Council), these elements are: instrumentation and control; connectivity; interoperability; security and privacy; data management; computing resource; and analytics (Achmad et al., 2018).

The Value Proposition

There are many definitions of the value proposition and that the concept is widely used by both practitioners and academics. The value proposition concept was first introduced by the work of Lanning and Michaels (1988), focuses on two key activities: developing the value proposition and creating a value delivery system. According to Buttle (2009), value proposition is explicit promise made by a company to its customers through the delivery of a particular bundle of value creating benefits. Furthermore, Osterwalder and Pigneur (2010), describe value proposition as a unity of the benefits offered by the company to consumers. Value proposition can also solve customer problems or satisfy customer needs (Sanawiri and Iqbal, (2018). A different perspective in viewing value propositions is through the lens of the customer (Holttinen, 2014). Hence, value proposition as experienced by customers can be viewed through different four different value concepts, which are sign value, experience value, resource and exchange value.

Value Proposition in E-Government

The value proposition in the public sector was firstly introduced in the UN report aforementioned: *World Public Sector Report 2003: E-Government at the Crossroads.* The public value is a way of capturing all the dimensions of the government performance towards its stakeholders (Kelly, et al., 2002). In the context of e-government the stakeholders include citizen, agencies, businesses and governments including government employees (Seifert, 2003). Therefore, public value proposition is conceived all of these stakeholders' preferences, since only stakeholders can determine what is truly value to them. In other word, the legitimacy of e-government in the form of smart city as part of the initiative depends on how well it creates value for the public by which the outcomes, services and trust that are aligned with the e-government strategic objective. Most studies

of value proposition in the context of e-government or public value explores the supply-side perspective whereas the user-centric or demand-side perspective remains understudied (Reddick, 2005).

In conclusion, this research will attempt to combine the two dimensions of smart city and value proposition together. The concept of smart city in this study is represented by the smart city app of SAMPADE which is a city app for local tax information and payment. As for evaluating this city app, this study will be using two different dimension. First, the app will be evaluated from a demand-side perspective introduced by Holttinen (2014), which consist of sign value, experience value, resource and exchange value. Second, the 7 smart city framework from Smart Cities Council (Berst, 2014), will be also employed to measure the apps performance from a stakeholder perspective.

METHODOLOGY

This research falls in the inductive research approach. Data in this study is collected from primary and secondary resources. The data resulted from on-site observation in Malang and in-depth interview with stakeholders (users, local tax agency government officials, and IT consultant) of the smart city app of SAMPADE. Case study approach that use in this study enabled the gathering of rich and fine-grained qualitative data. The foundation of this study is based on an extensive literature review of the concept of smart city and value proposition. Iterations with the literature review enhanced data analysis and theorization. In terms of the analyses this study apply Miles and Huberman's (1994) methodology of reducing data, processing data, depicting and verifying conclusions.

RESULT AND DISCUSSIONS

The City Government of Malang launched a mobile application for local tax service namely the SAMPADE App on May 21, 2018. The Smart City App SAMPADE is an android-based mobile application that is developed to manage local tax data and information. The SAMPADE apps was launched to facilitate tax payers via a mobile service, as an objectives for improving public service quality through simplifying the monitoring of the tax data, and also provide support for tax data updating. The result of this study is summarized (see table 1 and 2) according to the different dimensions in evaluating the smart city app of SAMPADE. The result and discussion is divided into two sections, first the value proposition of SAMPADE and secondly will be continued by evaluating the SAMPADE app from the Smart City Framework dimension.

The value proposition of SAMPADE app

1. Sign Value

The application of SAMPADE provides and facilitate taxpayers in accessing the local tax information. The mobile tax service of SAMPADE is considered to be more convenient and efficient from both the taxpayers and local tax agency. Through using the SAMPADE app, the taxpayer does not need to go to the local tax agency office, mandatory unnecessary queuing for tax service, the local tax agency officers do not need to meet face to face with taxpayers, and taxpayers do not need to rely on SPPT to examine the property tax statement. It is indicated here that the taxpayers as customer or users of the app perceived the` city app provides value proposition that address desirable outcome consciously enact in specific practice (Holttinen, 2014).

2. Experience Value

The value proposition offered by the SAMPADE app has been translated into different experiences by both taxpayers and local tax agency. The local tax agency perceived the SAMPADE app to be far from its potential in providing tax services. This is due to the low adoption rate and features used by taxpayers of Malang. On the other hand, the local property taxpayer fond using the SAMPADE app for viewing information on different tax objects, property payment bills and also payment history. As describe by Venkatesh et al (2006), that experience value is the subordinate from sign value which users are able to materialized the sign value into experience. Based on the users

perspective the experience of using SAMPADE felt to be satisfying, as it indicated to be much convenient, faster, and accessible in accessing the local tax information.

3. Resources

In order to use the smart city app for tax service, taxpayers must have an Android device, e-mail address, mobile phone number, and ID card number. Thus, this is considered to be resources that are easily met by taxpayers. In exchange, the operant resource of the local tax agency is the knowledge of the local tax information. The user of the SAMPADE app benefits from access to the official local tax data and information. Thus, the user of the SAMPADE app considered the operant resource of knowledge and skills (Vargo and Lusch, 2008) to be the fundamental basis of exchange offering between the users and local tax agency.

4. Exchange Value

The exchange value is seen to be both financially and non-financially beneficial (Holttinen, 2014). The smart city app of SAMPADE is considered to be financially beneficial as it is provided by the local government to taxpayers for free. In addition, the smart city app is also perceived to be non-financially beneficial by providing tax information and payment conveniently and reliably, while also saving time during the process of finding local tax information. Thus, this goes well with the fact that exchange value manifest and signifies the value of the app.

Table 1. The Evaluation of the SAMPADE based on the Value Proposition

The Dimension of Value Proposition	Results	Evaluation
Sign Value	Taxpayers experience the service to be more efficient.	Indicated
Experience Value	Taxpayers receive service easily, transparently, and quickly.	Indicated
Resources	Taxpayers believes the service useful and has the opportunity to going forward.	Indicated

Exchange Value	Taxpayers perceived beneficial as it is practical and responsive.	Indicated

The Smart City Framework Dimensions

1. Instrumentation and Control

SAMPADE is accessible not just for the local citizen of Malang but also other taxpayers who wish to register or seek information about the local tax of Malang City. SAMPADE app offers various tax services for both registered and unregistered taxpayer. The App provides a technological solution for the local tax agency of Malang City to both monitor and control conditions regarding the local tax registration, information, and payment. This mobile application assists the local tax agency to monitor the tax service remotely. As for the subject of control, the local tax agency of Malang can control the registered taxpayers' data, control the monthly tax report, and also new tax registration is directly controlled through the SAMPADE app and system. Therefore, the SAMPADE attributes here resemble the first dimension of The Smart City Framework (Berst, 2014) which refers to the ability of the city to monitor and control conditions of the city, in this case, the local tax.

2. Connectivity

The SAMPADE app assists taxpayers in fulfilling their local tax obligations. The users of the app can communicate and connect with the local tax authorities via the App without having to come directly to the local tax agency office. So according to the Smart City Framework (Berst, 2014), connectivity refers to the ability for citizen and devices to be connected with the control center or the city data center. The taxpayer data can be collected from anywhere and transmitted directly to the city data center. The two-way communication features provided by the App helps the local tax agency to also responds to tax service complaints responsively. Therefore, this app feature resembles the smart city framework dimensions of connectivity by which interaction between the local tax agency with the taxpayer via the app can perform efficiently.

3. Interoperability

The Interoperability dimension from the Smart City Framework (Berst, 2014), enables the concept for products and services from disparate providers can exchange

information and work together seamlessly. Since the mobile tax service app is developed by the local government of Malang, the current development of the app is not integrated with other tax obligation. The local tax data is centralized for the usage of the local government. The data is analyzed for the local city tax income or collection from the property tax only. Therefore, based on the Smart City Framework under the dimension of interoperability, the current development of the SAMPADE app is inadequate within this dimension and requires further development.

4. Security and Privacy

The SAMPADE app ensures that the taxpayer data is protected and secured. Data management of the app is centralized and managed at the local tax city server centre. According to the local tax agency, all of the policies and practices that safeguard data, privacy, and physical assets within the Smart City initiative is supervised by the city information and communication agency (Dinas Kominfo). The agency also ensures that the implementation of the cybersecurity of the SAMPADE app is managed and maintained safely. As a result, the dimension of security and privacy according to the Smart City Framework (Berst, 2014), is indicated as the App attempt to build trust for the taxpayers' data through the app security and privacy policy.

5. Data Management

The SAMPADE app provides the storage and management of data on a dedicated server owned by the local tax agency of Malang, with a domain that is managed by the Communication and Information Agency of Malang. The process of storing, protecting, and processing of the data while also guaranteeing its accuracy, accessibility, reliability and timeliness is considered essential by the local tax agency of Malang. The data management of the SAMPADE app is managed and maintained to ensure the taxpayers data integrity and value. This dimensions correspond with the Smart City Framework of data management (Berst, 2014) which highlight the importance of data management as it considered to be King in the Smart City concept.

6. Computing Resources

Furthermore, the compatibility of the SAMPADE's app regard to the dimensions of computing resources is developed with complex software. The software is developed

to accommodate citizen of Malang the accessibility of local tax information and payment. The app is provided with an easy instalment process on mobile phones with a step by step process to guide users setup. According to the smart city framework (Berst, 2014), the dimensions of computing resource enables the smart city to connect with other smart devices, software, and data. Therefore, it is indicated that computing resources is well accommodated by the smart city App of SAMPADE.

7. Analytics

Lastly, the evaluation performance of the SAMPADE app with the smart city framework dimension of analytics indicates that the app requires further improvements. According to the local tax agency, the SAMPADE app is not developed to predict each taxpayer tax obligation and local tax income projections. The dimension of analytics from the smart city framework (Berst, 2014) is considered to be valuable for the smart city concept. Analytics provide value from the data by analyzing conditions to predict future outcomes. To utilize data from the local taxpayer or users, the local tax agency needs to develop this new feature in the SAMPADE app. Consequently, tax data can be utilized across departments of the city government, providing with potential to identify new insights and unique solutions to delivering tax services, thereby also improving outcomes.

Tabel 2. The Evaluation of SAMPADE based on The Dimensions of Smart City Framework

The Smart City Framework Dimensions	Results	Evaluation
Instrumentation and Control	Services have been provided electronically through mobile app.	Indicated
Connectivity	Citizen and taxpayers able to connect directly with the city government to fulfill tax obligations via the app without having to come directly to the city government office.	Indicated

Interoperability	The app only provides users with the access of local tax information only. Other tax obligation is not informed in the app.	Not Indicated
Security and Privacy	The city government has made efforts to maintain the security and privacy of existing and future data registered through the SAMPADE app.	Indicated
Data Management	The data is managed and stored on a special server managed by the local tax agency. Data accuracy is determined by updates made by taxpayers which is stored and managed centrally.	Indicated
Computing Resources	The flow of each activity and regional tax interests carried out with the local tax agency becomes easier, neater, and well organized.	Indicated
Analytics	The SAMPADE app has not been able to predict information regarding local taxes in the future.	Not indicated

CONCLUSION

The article main contribution is to show that the two different qualitative dimensions of value proposition and smart city framework can be used to evaluate the smart city application. The first part of the research is to evaluate the value proposition of SAMPADE App from the demand-side view or the perspective of the customers. Result from the study indicate that all four dimensions of the value proposition of the SAMPADE App is accommodated by the app. Through this research, we indicate that the local government has considered the customer needs of taxpayers of sign value, experience value, resource and exchange value when developing the tax service app. However, the second evaluation using the dimension from the smart cities council, we conclude that not all indicators of the framework was developed in the smart city app of SAMPADE. Our research concludes that the dimension of interoperability and analytic from the smart city framework was not considered as the features of the SAMPADE app. Therefore, based on the smart city framework, the SAMPADE app requires further improvement and development.

REFERENCES

Achmad, K.A., Nugroho, L.E., Djunaedi, A., and Wiyawan. (2018). Smart City Readiness based on Smart City Council's Readiness Framework. International Journal of Electrical and Computer Engineering. Vol 8 (1). 271-279.

Ballantyne, D., Frow, P., Varey, R., and Payne, A., (2011) Value propositions as communication practice: taking a wider view. Industrial Marketing Management 40 (2), 202–210.

Berst J, (2014). Smart Cities Readiness Guide - The planning manual for building tomorrow's cities today [Internet]. Enbysk L, editor. SMART CITIES COUNCIL, 1-291 p. Available from: http://smartcitiescouncil.com/system/files/premium_resources/SmartCitiesCouncil- READINESSGUIDEV1.5-7.17.14.pdf?file=1&type=node&id=615

Buttle, F. (1999), "The SCOPE of customer relationship management", International Journal of Customer Relationship Management, Vol. 1 No. 4, pp. 327-36.

Chatfield, A. T. and Al Hujran, O. (2007). E-government evaluation: a user-centric perspective for public value proposition. In H. Arabnia & A. Bahrami (Eds.), International Conference on e-Learning, e-Business, Enterprise Information Systems, and e-Government (pp. 53-59). USA: CSREA Press.

Cooke, P., Laurentis, De., MacNeill, S., & Collinge, (Eds) (2010). innovation. In Dynamics of new industrial knowledge flows. Cheltenham: Edward Elgar.

Gawer, A., & Cusumano, M. (2002). Platform leadership: How intel, microsoft and cisco drive industry innovation (p. 336). Boston, MA: Harvard Business Review Press.

Gawer, A. (2010). Towards a general theory of technological platforms. Paper presented at the summer conference 2010 on opening up innovation: Strategy, organization and technology at Imperial College London Business School, June 16–18, 2010, 9 pp.

Greenfield, A. (2013). The city is here for you to use. Wired (5 February).

Holttinen, H. (2014). Contextualizing value propositions: Examining how consumers experience value propositions in their practices. Australasian Marketing Journal 22. 103–110.

Kadir, A., Kuswardani, R.A., and Isnaini, (2019). The determination on taxable income of land and building sectors in the implementation of autonomy and increasing income in North Sumatra, Medan, Indonesia. Journal of Transnational Management vo. 24 (1):40-63.

Kelly, G., Mulgan, G. and Muers, S. (2002), Creating public value: An analytical framework for public sector reform, September, http://www.strategy.gov.uk/ downloads/seminars /pv/ public_value.pdf.

Komninos, N., Bratsas, C., Kakderi, C., and Tsarchopoulos, P. (2015). Smart City Ontologies: Improving the effectiveness of smart city applications. Journal of Smart Cities, vol.1(1): 31–46.

Lanning, M. and Michaels, E. (1988), "A business is a value delivery system", McKinsey Staff Paper No. 41, July.

Maglio, P., and Spohrer, J., (2013). A service science perspective on business model innovation. Journal of Industrial Marketing Management. 42, 665-670.

Meijer, A.J., Gil-Garcia, J.R., and Bolivar, M.P.R. (2015). Smart City Research: Contextual Conditions, Governance Models and Public Value Assessment. Social Science Computer Review 1-10.

Miles, M.B., & Huberman, A.M. (1994). Qualitative data analysis: An expanded sourcebook (2nd ed.). Thousand Oaks, CA: Sage.

OKFN (2012). What is open data? Open knowledge foundation, open data handbook. Available online: ⟨ http://opendatahandbook.org/en/what-is-open-data/ index.html ⟩ .

Ostelwalder, A., & Pigneur, Y. (2010). Business Model Generation. New Jersey: John Wiley & Sons, Inc.

Reddick, C. 2004, 'A two-stage model of e-government growth: Theories and empirical evidence for U.S. cities', Government Information Quarterly, Vol. 21, pp. 51-64.

Sanawiri, B., and Iqbal, M. (2018). Kewirausahaan. UB Press. Pp. 83-84

Seifert, J. 2003, A Primer on e- Government: Sectors, Stages, Opportunities, and Challenges of Online Governance, Report for Congress, Received through the CRS Web, Updated January 28, 2003.

Shepard, M., & Simeti, A. (2013). What's so smart about the smart citizen? In D. Hemment, & A. Townsend (Eds.), Smart Citizens (pp. 13–18). Manchester: Future Everything Publications.

Townsend, A. M. (2013). Smart cities: Big data, civic hackers, and the quest for a new utopia. New York, NY: W.W. Norton.

Venkatesh, A., Peñaloza, L., Firat, A.F., 2006. The market as a sign system and the logic of the market. In: Lusch, R.F., Vargo, S.L. (Eds.), The Service Dominant Logic of Marketing: Dialog, Debate and Directions. M.E. Sharpe, Armonk, New York, pp. 251–265.

Walravens, N. (2015). Qualitative indicators for smart city business models: The case of mobile services and applications. Telecommunications Policy. 218-240.