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A Conceptualization of Smart Library in Indonesia

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Abstract

Even with the increasing relevance of a smart public library in the fast-paced environment like nowadays, a standardized definition of the term smart library is, in fact, still open for discussion, specifically in a developing country. This study aims to define the conceptualization of a smart library in developing countries. A case study encompassing documentation analysis and in-depth interviews with nine public officials at the Regency of Bojonegoro, Indonesia, was used to collect data. This study showcase that a smart library started from the innovative and inventive programs and services geared toward achieving the library as a place for the co-production of knowledge. Likewise, our findings further demonstrate that technology per se is not the most critical challenge for a smart library as compare to organizational, policies and regulations, and political issues in the case of a developing country. Thus, a smart library in Indonesia intensifies more effort to pursue smart services first, followed by smart governance, smart people, and smart place, respectively.

Keywords: Smart library; public library; smart public library; smart environment; smart city

Introduction

As one key indicator of successful government investment in information communication technologies (ICTs), public participation is often lacking. The key determinants affecting the lack of participation in government ICTs investment are the existence of data divide and lack of access to infrastructure or necessary skills (Gurstein, 2011). Public libraries have critical roles in bridging the connection between government and its constituents (Bertot, Jaeger, Langa, & McClure, 2006; Burke, Kowlowitz, Pardo, & Sutherland, 2014; Jaeger et al., 2014; Taylor et al., 2014). Public libraries could potentially improve participation in government ICTs investment, such as enhancing the achievement of community ecosystem for open government (Burke et al., 2014) and smart city (Mckenzie, 2000; Loerke, Wyatt & McQuire, 2018). Ideally, public library mediation improves digital inclusion, foremost to the benefit of the "grassroots" populations and those challenged in using and benefiting from computers and the internet (Sey, Coward, Rothschild, Clark, & Koepke, 2013).

The change in information environment due to ICTs advancement further augment the significance of libraries on improving public participation, enhanced libraries strategies, and management (Little, 2013). The cutting-edge ICTs transform libraries' roles, information contents, information services, data centers, and the relationships between a library and its user (Salem et al., 2012; Min, 2012) and bring up the phenomenon of smart libraries (Baryshev, Verkhovets, & Babina, 2018). In general, smartness refers to the use of ICTs in facilitating library processes and services (Freyberg, 2018). Further, smart concepts for a smart library characterized in four dimensions of smart services, smart people, smart place, and smart governance (Schopfel, 2018). Thus in the smart library concept, the library is irrelative to the collection, storage, management, and transfer of physical knowledge, such as books (Koehler, 2004). Instead, smart library functions more as information commons, learning centers, and cultural infrastructure connecting the community with information (Schöpfel, 2018).

On the other hand, standardized definition of the term smart library is, in fact, still open for discussion despite frequently used both independently or as part of the Smart City concept recently (Cao, Liang & Li, 2018). For instance, a smart library is often associated with user orientation that predicates the services on the users' information needs (Kim & Abbas, 2010; Alipour-Hafezi et al., 2019). The smart library also regarded as the provision of services that are "interactive, innovative, informative, real, changing and

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international" (Baryshev, Verkhovets, & Babina, 2018, p.537). Alternatively, the smart library means better facilitation of the information needs for the library's patrons (Schopfel, 2018; McKenzie, 2000). The limited studies conceptualizing a smart library often use developed countries as the basis of the case study.

Consequently, the above extant studies overlook the situational factors emanating from the complexities of a smart library in the developing countries (Chisita & Dick, 2018). Thence, this study discusses the conceptualization of a smart library concept from the public officials' subjective perception in the regency of Bojonegoro, Indonesia. This study thus questions the understanding of the public officials at local government in a developing county of what denoting smart in the smart library concept. This paper frames the smart library's conception using Schopfel's (2018) four dimensions of the smart library (smart services, smart people, smart place, and smart governance). This paper used document analysis and in-depth interviews to gather the data ascertaining the conceptualization of a smart library in the regency of Bojonegoro in Indonesia. This study conducted nine (9) in-depth interviews with public officials from the department of library and information services and the department of information and communication in the regency of Bojonegoro.

The remainder of this paper organized in the following manner: Section two will introduce previous studies on the smart library, focusing on the conception of smartness in the smart library. The research methods described in section three. Section four will discuss the results and findings based on empirical data obtained through in-depth interviews. Finally, section five will provide the discussion and concluding remarks, followed by implications and limitations.

Smart Library Concepts

Despite frequently used both independently or as part of the Smart City concept in recent, there is no standardized definition of the term smart library (Cao, Liang & Li, 2018). The roles of libraries in a smart environment, such as smart cities, have yet been defined as it should be (Jerkov et al., 2015). Clarifying the constitution of the term "smart" can contribute to understanding the diverse conceptualizations of the smart library. In terms of library, smart can be defined from the use of ICTs and automation in assisting the process in creating efficiency (Freyberg, 2018). Smart in the library is also an indicator that the library process and programs are flexible, innovative, adaptive, extendible, and acknowledging (Baryshev et al., 2018).

Additionally, the term "smart" also means user-friendly, representing the library's orientation to base their programs on real usage from the users (Nam & Pardo, 2011; Baryshev et al., 2018; Klein & Kaefer, 2008). A smart library very often being used to envision libraries of the future and was equated with digital libraries (Freyberg, 2018). Smart Library has many viewpoints and interpretations in terms of: the underlying technology, the transformation of its functions, and relationship with their partron.

Many studies propose the use of cutting edge technology as the basis to define smart libraries in general (Jerkov et al., 2015). In a smart library, the avant-garde information technologies facilitated the transformation of library services to their patrons from physical to the digital form (Min, 2012; Min & Oh, 2010; Cao, Liang, & Li, 2018) and to automate the library's business processes (Freyberg, 2018). Smart libraries necessitate the use of sophisticated technological hardware and software (Baryshev et al., 2018). To facilitate users' needs, a smart library provides location-aware mobile services for easy source identification (Aittola, Ryhänen, & Ojala, 2003). The complexities of services such as computer-aided services, cross-media services, and others, as argued by Kaklauskas et al. (2007), demand the facilitation of advanced information technologies. Furthermore, fulfilling the users' oriented needs mean that libraries must adopt interoperability and interconnection with other both public and private services (Alipour-Hafezi, 2011b; 2014; Schöpfel, 2018).

Smart libraries were often being defined as the transformation of the library's functions and service offerings from their traditional roles. A smart library was expected to offer more "interactive, innovative, informative, real, changing, and international" services to their patrons (Baryshev et al., 2018). The capability to self-renew, self-govern, adaptability, and perceptibility exemplified an intelligent library (Wahono, 2000). Smart libraries act as information commons as well as learning centers. Thus, libraries become a smart place to converge knowledge (Min, 2012) as well as an information hub, the provider of information among users and patrons (Schöpfel, 2018). Consequently, libraries must allow collaborations and connections among users (Schöpfel, 2018). A smart library must be user-oriented, adjusting its service offerings to cater to the users' needs (Kim & Abbas, 2010; Cao et al., 2018). The provision of ways for users to participate, communicate and collaborate to create content and services thus characterized a smart library (Baryshev et al., 2018; Curran, Murray, & Christian, 2007). To enable the libraries to meet the variety of users' needs, integration, and interoperability with other information providers such as government agencies and private institutions become important (Alipour-Hafezi et al., 2019). Especially

considering the limited resources that a single library has for effective functions and service offerings (Chisita & Dick, 2018).

Smart in the library manifests in four domains, namely: place, people, governance, and services (Schopfel, 2018; Freyberg, 2018). Smart services represent the innovation part of a smart library. In a sense, smart services refer to the development and offering of innovative tools and services to fulfill user needs. In short, the components defining smart services include innovative tools and services, a user-friendly orientation, and a user-centered approach (Schopfel, 2018). Smart people includes two components, namely: a smart community and co-production of knowledge (Schopfel, 2018). A smart community is when the stakeholders (primarily users and librarians) work collaboratively to produce and analyze information and data, and to manage the use of innovative discovery tools and applications. Whereas, co-production of knowledge represents the results of the said smart community in which the users and librarian co-create, enrich, and share information and knowledge (Schopfel, 2018). Smart place describes the conversion of the library building, space, and function into a building that: a) comply with sustainable requirements and b) improve the quality of life of the stakeholders (primarily users and librarians) and the attractiveness of the library as a place of knowledge creation. Finally, the keys to smart governance in a smart library encompass collaboration, cooperation, partnership, and participation (Coe, Paquet, & Roy, 2001). There are two aspects of smart governance, which is smart management and intelligent networking. Smart management means involving library users to take part in library management and administration (Schopfel, 2018). On the other hand, the smart network indicates openness and collective decision making. Thus, smart governance entails the effort to solve problems and issues of the library through collective intelligent and shared responsibilities (Schopfel, 2018).

Research Method

This study conducted documentation analysis and in-depth semi-structured interviews with nine public managers and other public officials from the department of library and information services and also the department of information and communication at the Regency of Bojonegoro, Indonesia. All interviews were recorded and transcribed as a whole to obtain dense empirical data. Interviews were transcribed and analyzed following an inductive logic and using grounded theory techniques (Strauss & Corbin, 1997). The analytical processes were conducted by the research team and were performed iteratively. The interview transcripts were analyzed by each team member and then discussed in a group resulting in inductive coding themes of the smart library. The resulting constructs were then contrasted with previous studies used as a theoretical lens.

Table 1. Composition of the Interviewees

No.	Department	Position	Number of Interviewees
1	Department of Library and Information Service	Head of Department	1
		Unit manager	2
		Staf	4
2	Department of Information and Communication	Unit manager	2
Total			**9**

Result and Discussion

This paper presents the preliminary efforts to critically analyze public officials' perceptions in Bojonegoro regarding their conceptualization of smart in the smart library concept. The findings thus represent the indicator of smartness from the provider's perceptions, the supplier side, of the library services. This section consists of two sub-sections. The first section describes the development of the digital government and public library in the regency of Bojonegoro. The second section discusses the smart library conception from four perspectives of smart people, smart services, smart governance, and smart place.

Description of the Case: Digital Government and Public Library in the Regency of Bojonegoro

The regency of Bojonegoro represents one of the most innovative and progressive regencies in using ICTs to promote openness and participation. The effort with the adoption of open government principles since March 2008 by firstly encouraging public discussion and participation were combining offline meetings and interactive dialog through public radio called “Radio Malowati Madani” (Adarma,

2017). The use of ICTs to support the openness and participation started in July 2014 through the implementation of two web-based applications called "Integrated Public Aspiration Systems (SIAP)" and "Public Aspiration Online Services (LAPOR!)." The apps enable the public to express their opinions, ideas, critiques, grievances, and input to the government (Heriyanto, 2017). Government agencies receiving complaints have five working days to respond to and resolve the issue (Heriyanto, 2017). Since then, the government extend the reach of the apps to every village within the regency jurisdictions.

Bojonegoro regency started to embrace the concept of Smart City when it was chosen to become part of the 25 cities/regencies pioneer to adopt a smart city as part of the "100 smart city movement" in Indonesia. Bojonegoro advances the smart city effort by putting forward smart people as their first target (Bojonegoro, 2019). With this objective, the regency aims to create a productive, communicative, and interactive society with high digital literacy. Specifically, the regency objective is to develop socio-technical ecosystems for humanist and dynamic society, both physically and virtually. For that, the regency aims to promote an ecosystem for efficient learning and community interactions. Here are some of the programs in the Bojonegoro's smart city strategies: a) an improvement on the management, restoration, and preservation of the regional documents and archives system, b) the development of e-library and e-learning to improve education services, c) strengthening public participation and consultation mechanism particularly at the sub-districts and village level, d) promotion and training for smart, healthy, and free of discriminations social uses, and e) an improvement in the digital literacy within the regency.

Achieving a smart library is thus part of Bojonegoro's smart city strategies. In recent, there are three major programs of the Bojonegoro public library. First is the implementation of an electronic library (e-library) and e-learning. Second is the integration of the public library with the surrounding school libraries and the provincial public libraries. Third is in promoting e-administration specifically for archive management. Bojonegoro public library also implements online catalog services in 2019 https://katalogdinasperpusarsipbojonegoro.perpusnas.go.id/. To cater to the needs of the primary users, students from schools and universities around Bojonegoro (Mubarok, 2018), the public library is expanding their reach by developing village libraries, training librarians for village libraries, and operating mobile libraries (ojenews, 2019). To further expand the effort for a smart library, Bojonegoro public library also conducted several innovative programs such as storytelling for students, web design training, entrepreneurship training, and others (Nugroho, 2019).

Conceptualization of Smart Library

The interviewees were asked to specify their perceptions of smart in the smart library using the case of public libraries in the Regency of Bojonegoro. The construct of smart from the subjective perceptions of the interviewees was measured based on Schopfel (2018) four dimensions of a smart library, namely: smart people, smart place, smart governance, and smart services. Given that most of the interviewees are officials and public managers from agencies in the local government, the smart presented in this paper represents the supply-side of the smart library, the provider of the services. The list of what constitutes smart in a smart library is presented in Table 2 categorized according to the four dimensions of a smart library (Schopfel, 2018).

a. Smart Services

Many interviewees associate smart in the smart library with library services and programs. The services offered by Bojonegoro public library can be categorized into three perspectives. First is the use of ICTs to enhance service provision, such as the offering of ICT-based smart program. Second is improving the reach of the program and ease of access to the programs and services. The third perspective is user-oriented programs or value-enhancement programs, such as entrepreneurship training.

The interviewees cited the use of ICTs to facilitate service offerings as an indication of effort toward the smart library at the Bojonegoro public library. The interviewees specifically mention four indicators of smart programs in the public library. The first indicator is the implementation of an integrated library system. The system was implemented in the second semester of 2019 and mostly provides

information about the book catalog. The next indicator is the provision of wifi and desktop connected to the internet to facilitate users searching for information. The head of the library and information service department argue that providing wifi and ICTs is the signage of change from the "old library" to the "new library." As stated by the interviewees, "the old library is a place to search for books and to read...the current library is not only for reading books, [we] provide wifi for browsing". In addition to the availability of wifi in the public area, the Bojonegoro public library builds a designated room for internet access separated to the other room. Offering smart programs is the third indicator. The interviewees assert that the "new" library gives the patrons training to use ICTs to stimulate users to make use of the ICTs facilitations provided by the "new" library. As argued by one of the interviewees, "...[we] train them to make a blog, to make video...those were not given in their school, that's how [we] support". Finally, the fourth indicator is the development of mobile-based applications for users.

Table 2. Perceptions of Smart in Smart Library

No	Indication of Smart in the Public Library	Category
1	Integrated system	Smart services
2	Facilitated by ICTs	Smart services
3	Networking	Smart governance
4	Information center	Smart place
5	Smart programs – ICTs based	Smart services / smart people
6	Users oriented programs	Smart services / smart governance
7	Using apps	Smart services
8	Smart programs – entreprenuership	Smart services
9	Use of social media and apps	Smart services / smart governance
10	Literacy center	Smart place
11	Outreach program – mobile library	Smart services
12	ICTs Training for librarians	Smart people

According to the interviewees, the second category of what constitutes smart is improving the program's reach and ease of access to the programs and services. The interviewees indicate two indications of smart in terms of smart outreach and access. First, social media, particularly Facebook, is used to inform the patrons regarding the past, present, and future programs and activities of the public libraries. The second is the use of a mobile library, a vehicle designed for use as a library, for outreach and expand access to the library services. The implementation of mobile libraries was conducted to overcome the limitation of access to the Bojonegoro public libraries and to encourage potential and inactive patrons to access library services proactively. The mobile library provides not only regular services such as lending books but also community development programs, such as entrepreneurship training. Or, programs involving children such as storytelling, handicraft, and educational games. This proactive strategy is crucial, especially to encourage access to library training at the village level. The villagers have no motivation to come to the public library in the "city" to join the training, so instead, the library must come to them. As stated by the interviewees, "...so if it [conducted] in the city, the villagers will not come...they will prefer to work on their padi field, it must be [done] in the village..."

Based on the interview results, the third perspective of smart services is the implementation of user-oriented programs or value-enhancement programs. Two indicators fit within the third perspective. The first is user-oriented programs, which means that the Bojonegoro public library solicits inputs and extracts comments from the users through social media use. The comments and inputs are then used to inform the decision making in the library. As argued by one of the heads of the library and information services, "...we evaluate the user's needs, ...from the users' comments we identify their needs in terms of infrastructure, facilities, and books...we use social media" Second, the interviewees also indicate the provision of value enhancement programs such as entrepreneurship training as part of what constitutes

smart in Bojonegoro public libraries. The interviewees regard this as fulfilling the role of the public library in propagating the mental revolution. As argued by the head of the library and information services, "that's what I meant...for mental revolution, smart mental for the people...by [for example] library encourage entrepreneurship and innovation..."

b. Smart Place

The library as a smart place, according to Schopfel (2018) indicates the operational shift of library building into a smart place for the furtherance of the city smartness. Our interview results demonstrate two interrelated functional changes of the Bojonegoro public libraries: the library as an information center and library as a literacy center. The interview results indicate that as an information center, the library will serve to assist the users to find information about the program of a government agency. One of the interviewees stated, "...this is a library...an information center...if people do not understand about the programs of the other government agencies...this library will provide guidance...help them find the information needed..." In relation, as the library function as an information center, the interview results demonstrate that the library is expected to improve people's literacy concerning government programs, particularly digital government programs. One of the interviewees specified "...the works of a library is beyond the boundary of the library office, it should also include improving the literacy of things such as open data and so on to the society..."

c. Smart Governance and Smart People

Smart governance encapsulates two dimensions, namely: a) smart management with the critical feature of user participation in decision making and b) smart networking, which is the use of collective intelligence for decision making. The interview results indicate the importance of both dimensions as an indication of smart. As pointed out by the interviewees and previously explained in the smart services section, the Bojonegoro public library uses comments and inputs from their users to inform their decision-making regarding expenditure for expanding collections, upgrade facilities, infrastructure, and so on. The interviewees also stated the importance of networking in the governance of the library. The networking was done not only with other public libraries but also with other institutions and agencies.

The networking was manifested in two forms: a) through the memorandum of understanding and b) through systems integration across different organizations. The interviewees emphasize the progressive collaboration between the public libraries and three institutions as follows. The first is their potential constituents, such as schools, universities, and Islamic boarding schools. Second, the other agencies and ministries, such as the department of education, the ICTs board. Third, the media, such as Bojonegoro radio, and d) the Non-governmental Organizations (NGOs) such as RTIK, volunteer for ICTs development in Bojonegoro. As stated by one of the interviewees, "...schools from preschool to the universities, the MOU related to the need of these schools and college students...we also invite experts, media, writers...what are needed, the library will aim to fulfill..." The networking is also manifested in the effort to create system integration between the department of libraries and information services with other agencies. The integration will be done through four systems: e-administration, e-library, Senayan, and other connecting information systems.

On the other hand, smart in terms of smart people in the Bojonegoro regency is still at a very early stage, according to the interviewees. While smart people in Schopfel (2018) framework refer to the co-production of knowledge, thus representing a collaboration between smart users and smart librarians. In the case of Bojonegoro, the focus is still on training for capacity building. The public library at Bojonegoro is still focusing on providing training both to the librarians and users concerning the use of ICTs. This point is emphasized by the head of the library and information services, "...we teach them to use smart technologies, digital literacy training...for them to be able to use their smartphones and applications such as Perpusnas and e-Busnas"

Overall, although still at the very early stage of development, the interview results from public officials and managers at Bojonegoro regency indicate that the public library geared their activities to achieve a smart library. However, not specifically label it as a smart library. Several activities conducted

by the public library are fit within the definition of smart in a smart library based on the Schopfel (2018) framework.

Conclusions, suggestions and limitations

The results from interviews and document analysis demonstrate that smartness in smart library emerges progressively and gradually in developing countries. Expensive investment in cutting-edge ICTs does not necessarily indicate achieving a smart library. On the contrary, our findings show that smartness progressively materializes through the implementation of innovative and inventive programs and services. Specifically, these innovative programs and services geared toward achieving the library as a place for the co-production of knowledge. Thus, offering productive and creative activities, such as entrepreneurial activity, represents a preliminary effort as part of a strategy to transform and reinvent the library as smart knowledge co-creation centers.

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