Integrated Virtual Communities into User Group Management System (UGMS) for Smart Cities

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Abstract. Society as a collection of people who are connected together based on certain understanding and bind by the regulation is adapted to perform multiple functions that for the sake of engaging technology advancement to improve the quality of life. Thus, there are some opportunities for application development to cater to the needs in the complexity of interaction between the individual in the society, one of them is user group management. This study is aimed to design the business canvas and mobile application by integrating virtual communities based on national identity in the form of e-KTP through Scrum method. Therefore, there are some challenges should be considered in the process of identification such as the right resource to implement the smart platform and the alignment between project objective and the readiness in the society. This study present APLICOT API as the framework for UGMS together with business model canvas, use case diagram and prototype.

1. Introduction
The life of social community in Indonesia has high solidarity with many people has been followed panguyuban or association, which may take non-formal approach such as citizen gathering or in the formal approach such as professional conference. Commonly, there are activities to raise funds through concept of contributions in the group membership as the participative concern for the sake of updates and acknowledgement. Therefore, it has the limitations due to coverage and monitoring process in which the greater effort is required to manage the finance. With the development of internet technology and digital transformation are now entering the life of Indonesian society with many people share the same interests and goals in an online community, the concept of smart society become relevant. In this case, the online community illustrates how theories from social science literature can be applied to gain a more systematic understanding of the online community and how the theory-inspired features can enhance their success. Technology and human social life have changed along with the way humans themselves in interacting with the world, both in terms of business and social. This change is accompanied by the emergence of the term online consumption community, a group that is detached from geographical boundaries and able to interact with each other online anywhere and anytime. Along with the development of social media, then automatically, such groups are also popular, and make more and more people who can join the group.

Population is actually the main basis and the focus of all development issues, which both sectorial and cross-sectorial which can become the subject or the object. Large populations will still be meaningful if most of them are able to work and participate in development. On the other hand, a large population will increase the economic burden and development, if not empowered properly. The idea of
establishing an administrative system involving all population issues, including population registration, civil registration and the management of population data. Until now, there is always opinion from society that the related legislation that supports the process still complex, separated or runs independently that somehow contradict between each one’s. The realization of a system is very coveted by society, even as a hallmark of the implementation of a modern state, especially the field of community service. As far its concern, the performance of public services in the case of administration still unsatisfactory such as identity card (KTP), family certificate, birth certificate, etc. The lack of performance of public services is very large impact, especially on the social and economic fields. However, there are many problems that arise in the fulfilment of birth certificates, especially for children are as follows such as wild charges, official charges under the pretext of printing costs, regional cash, discrimination against parents living in areas considered "wild", the process is not transparent, no service standard, there is no oversight of service, socialization of minimal and vast territory of Indonesia. This research is intended to produce a product in the form of mobile application called e-Rekat that can be utilized by a Pangguyuban or association in overcoming the problem of financial management. In this applied product research, the team used the Scrum research method. This approach tries to overcome the gap problem between analysis and implementation that often arises on a linear approach when dealing with complex application needs. It also expected to eliminate various problem occurred during planning and design phase related to inaccuracy and misalignment.

2. Literature Review
Technology and human social life have changed along with the way humans themselves in interacting with the world, both in terms of business and social. This change is accompanied by the emergence of the term online consumption community, ie groups that are detached from geographical boundaries, and able to interact with each other online anywhere and anytime. Along with the development of social media, then automatically, such groups are also popular, and make more and more people who can join the group [1]. Digital development and transformation has now entered the life of society in more depth. These developments and transformations change the way learning, work, communicate, and collaborate. This is influenced by the technology of the Internet of Things or so-called IoT which has a disruptive business concept and also growing fast. The rapid development of Internet of Things is due to the high penetration of social media, smartphones, and other mobile devices that can easily connect to the internet [2]. Implementation of the group management system in smart society platform can be designed based on the elaboration of previous research, with self-service such as personal information service, group identity management, dynamic shared space, novel spatial approach, group product knowledge, file transfer communication support system, social event interaction and digital membership [3].

The availability of information and transaction is the critical ingredient to maintain the digital activities, while the technical and administrative effort become a supporting role whereby the regulation protect the organization from the online process of malicious attacks and avoiding the damaging impact on the need of data subject [4]. Furthermore, the information management includes core competencies that allow for efficient access to the sources and to represent the production of information. Thus, the knowledge management should be involved as main attribute for application development for the knowledge creation and transfer to generate competencies that allow transferring the implication of project based on certain factors through the conceptual mediation of certain languages [5]. The smart society has vision to accommodate the personal autonomy while at the same time seeking to influence with incentives and persuasive technologies. It aims for a degree of self-regulation by giving participants access to information resources and widening their capacity to act, and to impart the flexible direction and make wider patterns of behavior align with centrally defined goals [6]. There are certain issues in the regulation form of language that is intrinsically vague and cannot translate to every factual situation in which it is applied, as well as cause by the political factors [7]. Unfortunately, majority of individuals have not concern personal data protection as important features; when the government gather the personal data from societies, people often state that they do not concern on that activities by saying that they do not have anything to to hide [8]. On the other hand, IoT typically assumes constrained node and
network, which historical full stack protocols are not appropriate to deploy and subsequent fragments carry only a part of the payload [9]. Furthermore, IoT was found well known acceptance from various type of customers, which operational cost can be reduce through cloud computing or mass production of hardware manufacturing cost through multiple function of device to run intelligent function. In addition, the introduction of IPv6 provides far bigger addressing space to allow availability, consistency, compatibility and extendibility [10].

3. Research Methodology
With reference to the SCRUM method, this study will be divided into 4 release phases, where each release phase has a duration of 6 months. In every phase of the development, it expected to release the product into 4 times iteration (sprint), within 6 weeks long. At the end of each release phase, a decent application will be published in the marketplace platform as the most viable product (MVP) to test the acceptance from the potential customers. With the rapid introduction to the market, the assessment in the form of feedback is extremely critical as the list of material improvement for the next release phase to meet with the customer expectation aligned with the research objective. An effective interface for mobile devices require continuous optimization with high performance to solve particular problem from the users. The increase in the use of on-line systems has led to an increases demand in the higher productivity for program development or application program that have attribute of cross platform coverage. To develop the Interface Design, this study identified API APLICOT (Application Platform for Integrated data base & data Communication) and develop 54 APIs (Application Program Interface) based on 6 types of online process, which can reduce backlog and data redundancy.

4. Discussion
Business Model Canvas (BMC) has its own uniqueness that is making a very long business plan that requires big effort can be built into a faster and structured approach through portfolio of idea. It also suitable for the beginner because the written mechanism based on intuition with focusing the customers’ values oriented. There are 9 blocks that are the primary focus of the application development namely customer relationships, value proposition, key activities, key partnerships, customer segments, key resources, distribution channels, cost structure and revenue streams. One of the main focus on BMC is the value proposition, which aims to help determine the added value of a business that can be provided to customers. In general, it consist of a series of services to differentiate with the others to raise the selling point and increase the demands. There are some skills that is critical in this case include, entrepreneurial knowledge, skills using tools to design interaction properly, the ability to think uniqueness, to feel the empathy and to experiment. In this research there are 3 steps used, which are
mobilization that is determining the important elements that will be used in designing a business model. The next step is understanding by verifying and validating the requirement analysis and user specification, that the required knowledge through literature review and interview the expert related to the business model through business plan and environment. The latter is the application design, in which fixed business model has adapted based on the previous steps has been transformed into mock-up to present its features and function. Basically, the reason individual join a group is their desire to be acknowledge by the society, which is called the sense of community (SOC). It is defined as a sense of belonging and sense of respect for others in the group that emphasizes their commitment to be together. Actually, the principle can be categorized with four things, namely membership, influence, needs fulfilment, and emotional connection. In the service oriented architecture, the design focus on important component such as the service requestor that is looking for and finding the services need by customers, the service registry that regulates in making registration through web service and the service provider that is processing a registry to run properly.

Figure 2. Business Model Canvas for User Group Management System

Figure 3. Use Case Diagram for UGMS

In the literature discussion [11], the development of smart concept supposedly refers to the role of Penta Helix namely academic (conducting surveillance and community service), business (improving digital infrastructure in terms of quality and reachability), community (in cooperation with stakeholders
in speeding up the implementation), government (involving the key actors, initiators and developers) and media (conveying information and publications aimed at educating the public and being a channel of feedback on stakeholders). It is a socio-economic development model that drives economic knowledge to create innovative and entrepreneurial collaboration that is beneficial to academia, government, NGOs, the public sector and business as a strategic blueprint for the development of an innovation. Thus, the design of UGMS involves business service system, government service system, media service system, academic service system, society service system through the data collection and integration of e-KTP, family card, passport number, birth certificate, national lecturer’s number (NIDN), driver license and tax ID number (NPWP). Meanwhile, in the interaction process, the minimal requirement for the application including the chat within group members, contact information sharing, photo gallery presentation, member schedule management, location information awareness and subscription payment. On the other hand, the attempt for privacy protection and user control supposedly are not limited during the activity in utilizing the menus and features in the application only but also concern before and after the process as the prevention and anticipation attribute become the main consideration [12]. Use case diagram in the above describe the relationship between the elements of the system that will be developed in this study, which consist of four components, namely the actor used to describe the individuals involved in a system (user of a system element), the role that the actor has on a system or its surroundings, the boundary that defines the interests of the system and its relation to its surroundings. Currently, virtual communities with social networking play critical role to influence the socio-culture, the economy and the perspective of human generation, as the platform to accommodate people in the intense connectivity and mutual interaction [13].

![Figure 4. Prototype for User Group Management System](image)

E-KTP is a residence document which contains security system or data control from as the administration of information technology based on the national demographic database, which is identified as the Population Identity Number (NIK) and valid for lifetime used. It is used as the basis for the issuance of passport, driver's license (SIM), taxpayer identification number (NPWP), assurance letter, right certificate on land and the issuance of other identity documents in which all of them are contained in Article 13 of Act no. 23/2006. By integrating the data into digital system, it has several benefits for its users, such as the data integrity who cannot be forged, cannot be duplicated, and can be used as a voting card in the authentication process of national or regional election. Meanwhile, mobile platform as the place for UGMS can help users to connect and maintain information with bigger ecosystem from anywhere, with any device and anytime whom likes compare to other platform through attractive and interesting features such as location awareness, ambient intelligent, push notification, scheduling management, augmented reality integration, business-driven solution and so on.
Communities can be managed in the form of groups online by utilizing multiple channels communication with customers, workers, colleagues and business associates and managing simple pages for activity or profile. In addition, the stakeholders in the smart city domain not only need to manage billions of sensors and devices emerging through the realms of the IoT but also need to be able to make informed decisions based on these massive amounts of data within these complex systems [14]. However, the current industry have not yet from conventional approach into modern ways but IoT can be used to bridge the gaps by improving the accuracy, obtain relevant and valuable content from customers and real-time response with the intention to change or enhance the customer behaviour [15].

5. Conclusion
A smart society has been successfully harnesses the potential of digital technology and connected devices and the use of digital networks to improve people’s lives through the concept of utilizing the availability and compatibility. It has the main objective to retrieve and compare multiple information for the purpose of decision making boundless and limitless. The UGMS in the form of e-Rekat has been developed to maintain big data involving the identification number for authentication and authorization to obtain certain privilege in assessing the community service. Further study to investigate the implication for integrating the application with payment gateway through self-sufficient UGMS to align with the cost requirement should be considered.

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