

## **E-Sungai Dulang: The Development of Website for Embracing Community Empowerment and Leadership in Digital Environment**

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**Abstract:** The development of the E-Sungai Dulang website motivated by the government initiative in urbanizing rural regions through digitization. The community leader (*Ketua Kampung*) and the residents (*Penduduk Kampung*) are expected to have digital abilities that not only limited on the smartphone but also with other digital equipment that includes laptop, printer and the internet. Thus, in this study a website has been selected as a platform that for rural communities of leaders and residents in empowering themselves to adapt global information technology that extend further from the limit of the mobile messenger application such and the social media. There is a need to embark on this project as from the interview conducted, none community leader has used website as part of their administrative work for the village and with the villagers. The use case of the website for this study has been anticipated from the observation of the similar apps that also built for the community. The features of the website include the Appointment, Booking, Announcement and Inquiry. The website features and function has been developed using Bootstrap framework and MySQL as a database. The use of the website that attach to a specific rural communities such as Sungai Dulang is not yet common therefore further evaluation still need to be done on the selected community as a future work of this project.

**Keywords:** Community, Website , Leadership, Empowerment

### **1. Introduction**

Information Communication Technology (ICT) has becoming a factor in fostering the digital culture among the rural communities [1]. In digital culture environment the relationship among members in the society can be enriched as people not only receive passively the information but also can be the author and contributor of the information in various ways. Through ICT and digital technologies , strangers could interact and react to the point of information actively thus assemble the

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new norms of socialism that connecting everyone to everyone on the digital media [2]. ICT applications that also ranged from on-the-web to mobile, has play a role in empowering society in diverse context of use. *Facebook* and *WhatsApp* are two social media apps has been studied significance as disaster management tools [3]. *Instagram* and *Twitter* are another two kinds of ICT applications that authorize people from diverse ranged of social groups to self-express their own stories [4][5]. It is also found that the people self-esteem and dignity improved with the ability to perform task such as online shopping and banking or in operating word processing and e-mailing [6]. The web platform such as CHONOS has been used to provide dynamic oceanographic knowledge that can be accessed freely by the authorities and local communities of farming and fishing in rural areas to make a sustainable decision for their own well-being in coping as well surviving with the uncertainties of the natural environment [7].

ICT usage and adoption are ways to urbanize rural regions however it is not exclusively centred on the availability of digital infrastructure but more on the political will of community and government leaders [8]. Telecentres are example of the government initiative to promote interest in accessing computers, software and internet among rural communities [9]. In Malaysia telecentres development has begun in year 2000. This telecentres known as *Pusat Internet Desa (PID)*. In Indonesia the ministry has introduced smart village through *Taman Literasi Digital*, Village Information System and Village website as an effort to introduce and train the communities in using the internet [10]. Regardless ICT based effort being made, if there is no effort in bonding between the individuals and the meaningful digital environment, the solutions proposed will be ignored even there is an innovative potentials that could improve and empower the communities rural regions. It is suggested in [11], the digitalisation in rural areas should apply principle of place attachment in three facets of social, content and emotion.

### 1.1 Background of the Study

Community can be interpreted as members of a society living in harmony and stability that have relationships between individuals that are personal, face to face, friendly, close and lasting. Individuals involvement in the community not limited as family members but also as close friends or bonding as a social groups [12]. The community often attach to the place and for this study defined as rural areas located in Malaysia within the state of Johor. Community leader therefore in this study refer to the individual appointed to be responsible as government transformation agent [13]. The objective of this study is to develop a website as a digital platform that include features for the community leader to publicize widely any effort and initiative for the rural transformation and community development. This website also intent to be a platform for the community members to engage freely with the information and services that could be used to assist them in making a decision or solving a specific problem.

The proposed website has been named *E-Sungai Dulang* built upon by the community place called *Kampung Sungai Dulang* (Kg. Sg. Dulang). Kg. Sg. Dulang is a rural regions of one residency in Mukim 11 Sungai Punggur situated within the small district of Rengit, Batu Pahat. The geographical coordinates for the Kg. Sg. Dulang are estimated at 1° 40' 20" North, 103° 10' 48" East. Pekan Rengit is the nearest town of this village. Sungai Dulang is one of the *Malay* settlements that was believed originated from the *Bugis* people migration to the state of Johor in late 17<sup>th</sup> and early 18<sup>th</sup> century [14]. According to the local residents, Kg. Sg. Dulang is divided into two areas that referred as *Darat* and *Laut*. However, there is only one community leader addressed as *Ketua Kampung* by the local residents. Among entrance for the visitor to the Kg. Sg. Dulang is from *Jalan Rejo Sari* and *Jalan Pontian*. Along the road, the visitors can access to the amenities, facilities and businesses such as mosque, small eatery place or in Malay often termed as *Warung*, homestay accommodation and community hall that also called as *balairaya* by the residents. Community leader or the *Ketua Kampung* is the one who the villagers or local residents will be refer to regarding the infrastructure or any other well-being issues.

## 1.2 Motivation of the Study

Global development nowadays is based on ICT and digital innovation, thus the community leader in the rural areas must have ability in operating digital equipment that not only the smartphone but also laptop, printer and the internet [15]. The urbanization of the rural area through a cyberspace, in which begun more than a decade ago and until today has becoming a continuous collaborative effort between the government and the service provider in implementing initiative such as *Desa Digital* [16], *Kampung Digital* [17], *Agenda Johor Digital* [18] and *Jalinan Digital Negara* [19]. This is a sign for the communities in rural regions will be immigrants in digital world thus there is needs in learning and adapting with various communication and information platform on the internet , that is not only social media or mobile apps but also the website.

A website is an emergence media on the digital platform that is believed historically as continuation of newspaper and television[20]. In computer science perspective, the website is considered as software application that uses world wide web technology. Digital interaction on the website however is not often direct and linear as observed on the mobile messenger applications on the smartphone. Thus to leverage ICT , digital infrastructure that is government initiated in rural areas and the digital ability, the website attach with the features and characteristic of the place can be a platform for the community leaders to embrace leadership in a digital culture that leads to the improvement of community well-being.

## 2. Materials and Methods

The qualitative approach with nonprobability sampling has been used in this study. The process of website development followed the modified waterfall phases [21] . In modified waterfall model, the developers are allow to go back to previous phases to verify and validate the requirement, the use case, the design and the implementation approach.

### 2.1 Preliminary Interview

The semi-formal interview has been conducted at the early requirement phase of the project. Three community leaders has been selected through convenience sampling [22]. The interview was conducted on the phone and the purpose is to get insights regarding the technology usage in performing work as a leader of the rural communities. The questions can be divided into demographic (age, education), technology usage (frequency, purpose), interaction with the community (information, meeting) and issues when using the technology.

### 2.2 The Use Case (UC)

In anticipating the use case for the *E-Sungai Dulang*, three similar application that built for interact and assisting communities has been observed as summarized in **Table 1**. Three applications named as Volunteer Smartphone Patrol (VSP), Intelligence Residence Management (iRM) and LYVE. All these applications however are mobile apps. Community is a target group for the apps and the management is the party who will used the input from the community and send output to the community.

**Table 1: Similar apps observed to anticipate use case for *E-Sungai Dulang***

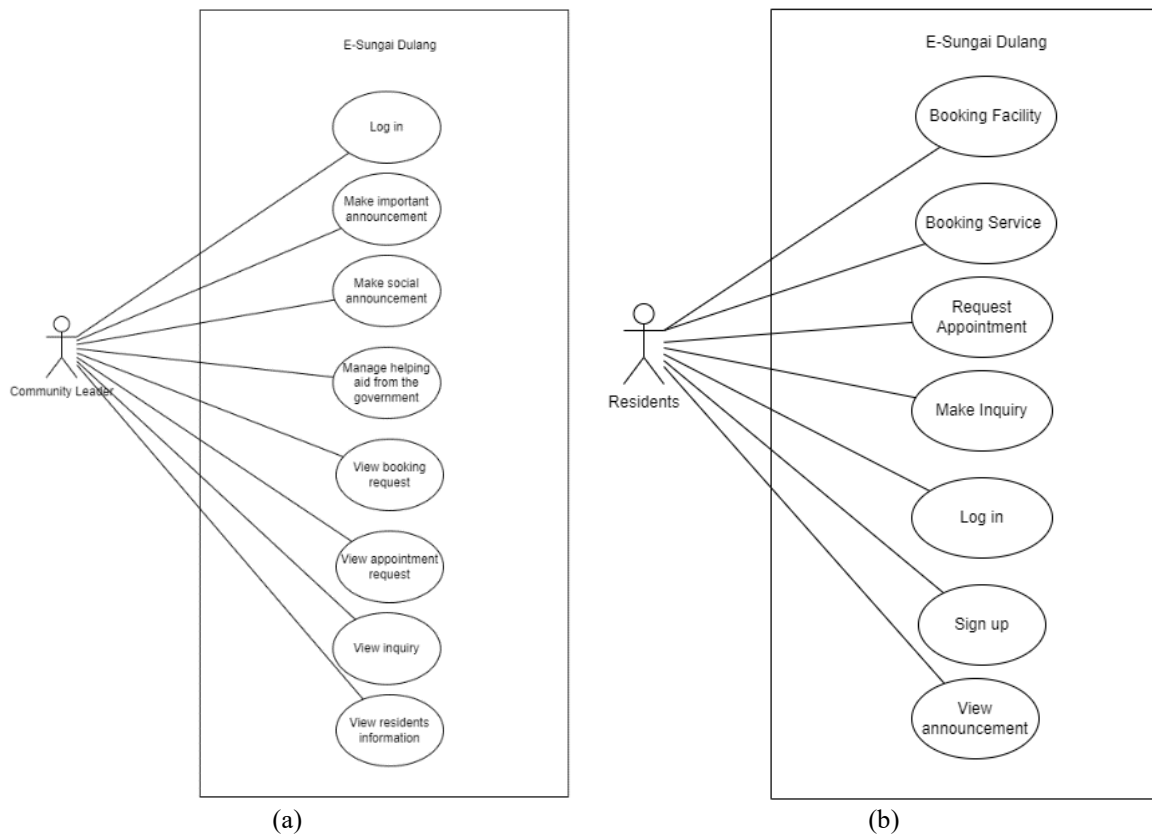
App Name/Title	Community	Management	Key Features
Volunteer Smartphone Patrol (VSP)	Public/Malaysian	Police/PDRM	Log In, Make a complaints, Self-reporting
Intelligence Residence Management (iRM)	Homeowners	Resident Office	Sign-in option (owner/tenant/new tenant)
LYVE	Gated residence	Management committee	Login / Create account Announcement Shop/Services

There are two main actors has been identified that will operate and interact the website that classified into community leader (*ketua kampung*) and residents (*penduduk kampung*). The summary of the use cases for each actor shown in **Table 2**.

**Table 2: Summary of anticipated use case for E-Sungai Dulang**

Actor	Use Cases
Community leader	Log in, Manage government aid info, Make announcement, View appointment request, View booking request, View inquiry, View residents information
Resident	Booking facility, Booking services, Request appointment, Log in, Sign up, View announcement

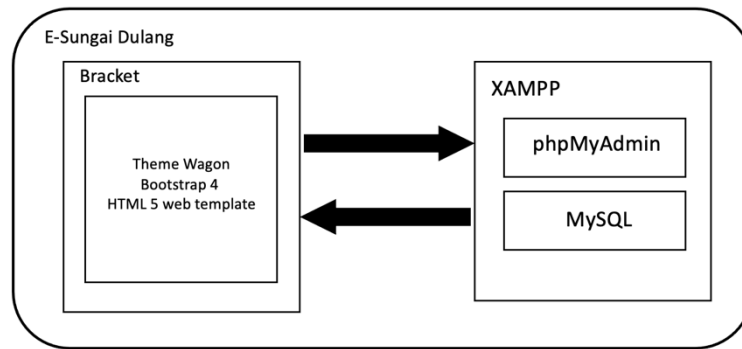
The use case diagram for E-Sungai Dulang of web-based system shown in **Figure 1** where **Figure 1 (a) and (b)** shows the anticipated use case diagram of the community leader or *Ketua Kampung* and the use case diagram for the residents or *Penduduk Kampung*, respectively.



**Figure 1: Use Case, (a) Community Leader, (b) Residents**

### 2.3 Website Prototyping

Prototyping is a way to visualize the use case of the website and its be done in phases of system design. The prototype was developed using the world wide web development tools that include *Bracket* for code authoring, open source web server solution of XAMPP and use Bootstrap framework for the website. One advantage of using Bootstrap in website development, quick design and prototyping can be done faster and system concept either it is on mobile or on the desktop can be tested earlier and features can be enhanced overtime as there is available documentation can be referred and the supported and experienced community in design and development using Bootstrap [23]. A technical component of the development framework for this project as shown in **Figure 2**.



**Figure 2: Software Component for the System**

### 3. Results and Discussion

The result of this study will be explained in two section that is the finding from the interview with the selected community leader and the prototype of the proposed website for Kg. Sungai Dulang.

#### 3.1 Interview with the Community Leader

The respondents age between 48 and 61 years old and community leaders assigned as *Ketua Kampung* and *Pengerusi Jawatankuasa Penyelaras*. All of them has high school qualification of *Sijil Pelajaran Malaysia* and one of them has university qualification graduated in 1996. All of them has mentioned that they are using technology frequently almost every day. Among the purpose of using the technology is to deliver information, manage application, perform daily work, acquiring information and information marketing. As a community leaders, they are using *WhatsApp*, *Telegram*, *Facebook* and physical notice board to send information and assisting aid to the community members. The residents also can meet them either online via *WhatsApp*, phone and video call or face-to-face at their office or at home. Among issues raised in using the technology, the unskilled residents, limited coverage from the service provider and unstable internet connection.

#### 3.2 Website Features and Function

The finding from the interview has shown that none of the community leader has been used any website to perform any administrative work for the village and with the villagers. For that reason, anticipation design approach thus applies in developing features and function of the website. The website has four menu options for the community leaders to perform work related to the village and the residents. That menu is *Appointment*, *Booking*, *Announcement* and *Inquiry*. **Figure 3 (a)** shows the landing page for the community leaders that play roles as authorize web admin.

The *Appointment* menu is used to manage any meeting request from the residents, the *Booking* to view and find the solution for the problem and services being booked, the *Announcement* used to post different category of information that is *Social*, *Formal* and *Government* that is public to view by the residents and the *Inquiry* is the menu for the community leader to see if there is any questions or issues raised by the residents that not be shared via group in the mobile messenger apps. **Figure 3 (b)** shows the landing page and example of *Announcement* that is classified into *Social*.

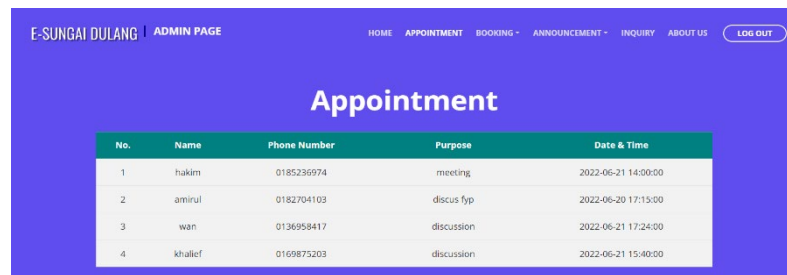
Operation such as *Update* and *Delete* as seen on the *Announcement* landing page allow *Ketua Kampung* to manage information faster as one click in contrast of scrolling to find, copy, edit, paste and delete in *WhatsApp* and *Telegram* or on the Social Media page. This features support the nature of information that flow organically either from the government or other stakeholder but the community leader has option to manage the information easily. **Figure 3 (c)** shows the landing page of the *Appointment*.



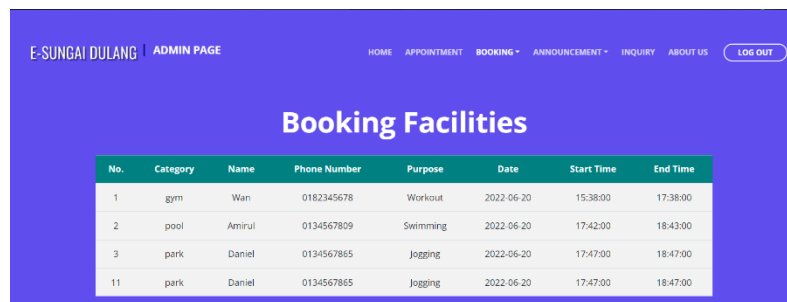
(a)



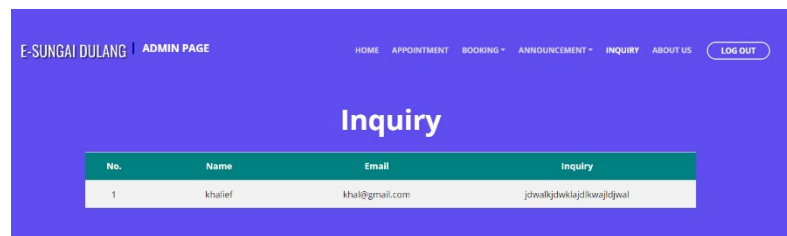
(b)



(c)



(d)



(e)

**Figure 3: Landing Page for, (a) Ketua Kampung as Web Admin, (b) the Ketua Kampung to View, Update and Delete Announcements, (c) the Ketua Kampung to View Appointment Request, (d) Booking Made by the Residents, (e) Inquiry**

Appointment request can be organised in table when using this system that will benefit the *Ketua Kampung* in viewing information for same purposed row by row instead of finding it via scrolling the chat message on social media or mobile messenger apps. **Figure 3 (d)** shows the landing page of *Booking*. This is wish features as there is no confirmation on facilities available at the place.

The *Ketua Kampung* can used information on the booking table to identify the availability of the venue by its category and make announcement or response personally to the residents who make the booking request. **Figure 3 (e)** shows the landing page of *Inquiry*.

The *Inquiry* options on the website could give a sense of privacy among the residents who did not intent to share their mobile numbers and could give opportunities to the ‘strangers’ residents interact with the community leader about any issues of concern.

#### 4. Conclusion

The development of the *E-Sungai Dulang* web based application is motivated by the government initiative in transforming rural regions to be at the par with the urban areas. The community leader (*Ketua Kampung*) and the residents (*Penduduk Kampung*) should be able to acquire and practice digital skills on the platform that is further from on-mobile messenger apps that includes *Telegram* and *WhatsApp*. The community leader as an agent for the government effort on digitalisation must be able to use place attachment website not only dependent on the social media in channelling information to the community. This project not yet reached the full implementation as the system still being re-design and tested on the local host. Further verification and validation need to be performed to evaluate the *E-Sungai Dulang* website as digital media platform for the community leader and the residence at Kg. Sungai Dulang. The selection of Kg. Sg. Dulang as a place attach to this website is based on convenience sampling considering the readiness potential shown by the community leader of the place during the interview process. But this *E-Sungai Dulang* website project can be treated as a case study for other digitization initiative of rural regions.

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