

# Analysis and Design e-Government Website for Special Allocation Fund

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**Abstract—** In this paper focused on the development e-Government website that aims to increase the services to public. We use SWOT analysis to evaluate threats and opportunities from rapid changing environments, and also investigate the organization's strengths and weakness before start to develop the new e-Government website. While the website can be modularized and was limited by time, it adapted the Rapid Application Development (RAD) Methodology. This paper also presents architecture of e-Government website which is used website scrapping technique to retrieve information from other websites. To measure successful on service level of to-be e-Government website, this paper refers to World Bank's standard measurement.

**Keywords** - e-government website; website scrapping; World Bank's standard measurement; rapid application development

## I. INTRODUCTION

The presence of e-Government website on providing information exchange between government and citizen or central and local government was supported by many parties [1][2]. This is not only supported by Indonesia government itself but also supported by other countries, e.g. Australia through Australia Indonesia Partnership for Decentralisation (AIPD) programme.

AIPD is a five years' program which provides support for technical assistance and capacity building to the central government, local government and civil society to improve the management of public resources, especially in the sectors of education, health and infrastructure that could have an impact on the improvement of public services and poverty reduction. In 2013, the commitment between AIPD and Central Government has been approved in the form of Annual Work-plan 2013 by Program Coordinator Committee / PCC, which consists of 3 ministries, including the Ministry of Home Affairs, Ministry of Finance and Ministry of National Development Planning.

Especially for Regional Autonomy Directorate of Ministry of National Development Planning, AIPD is supported to reformulate Special Allocation Fund. That is a fund sourced from state budget allocated to a particular region with the aim to help fund of special activities of the region in accordance with national priorities. Other kind of AIPD support is funding the development website of the Directorate of Regional Autonomy, Ministry of National Development Planning.

In fact, Directorate of Regional Autonomy has a web page, which is part of website of Ministry of National Development Planning. However, the features are still limited. In addition, based on measurement for e-Government followed the World Bank's standard measurement, the as-is e-Government website is still on Level 1 (Publishing/Informational e-Government). Furthermore, while the website can be modularized and was limited by time, it adapted the Rapid Application Development (RAD) Methodology [3].

This paper discusses the development of e-Government Website Directorate of Regional Autonomy, Ministry of National Development Planning by using RAD methodology in order to increase the level of measurement for e-Government website.

## II. LITERATURE REVIEW

### A. Rapid Application Development Methodology

Although Rapid Application Development (RAD) model was proposed by IBM in 1980s, however software communities just knew RAD after James [4] released his book to public. RAD methodology aimed to develop a system more quickly or much faster [5] by dividing them to be four main phases [4]:

1. The phase to gather the requirement by utilizing elicitation techniques (e.g. brainstorming, interview, and so forth), well known as Requirements Planning.
2. The phase to capture user's feedback by presenting a prototype by utilizing development tools, named as User Description.
3. The phase to refine the prototype before it released to the customer, well known as Construction.
4. The last phase is to test user acceptance and their training, well known as Cutover.

If software can be modularized and distributed to different teams in a fixed time, so that it can be considered to employ RAD methodology [4]. Moreover, as consideration to use this methodology or not, the benefit and drawback also will be presented. The advantages of this methodology are [4]:

1. By utilizing powerful developer tools like Visual C++, Java and so forth, the time frame for each delivery (called *time box*) can normally be achieved in 60 to 90 days
2. User is involved at all of development phase so that it can be assured to obtaining the user satisfaction.
3. The user feedback can be identified in initial phase.
4. The time of development cycle can be decreased by reusing related components and powerful development tools.
5. Results into reduced costs as less developers are required.
6. The independent modules can be integrated and the quick turnaround time from requirements analysis to the final delivered system.

However, this methodology was followed by several disadvantages. They are [4]:

1. The skilled professional is needed to build prototype quickly by utilizing efficient tools.
2. Team leader, developers and users must be build close relationship and communication to gather the feedback quickly so that can be maintained the project in time.
3. Unidentified reusable components can be affected to failure of the project.

#### B. Level of Measurement for e-Government

The measurement for e-Government in terms of the nature of communication followed the World Bank's standard measurement divides into three levels [6]:

##### 1) Level 1: Publishing/Informational e-Government.

This type of website called as brochure-ware because presentation of general information is passive. e-Government website develops to present simplest contents (e.g. operational period, mailing address, phone numbers and offers the limited features which there is no capabilities for citizens to interact.

##### 2) Level 2: Interaction/Responsive e-Government

This type of website offers relatively simple interactions which revolve around information provision. It designed to help the public avoid a trip to an office or make a phone call by making commonly requested information and forms available around the clock.

##### 3) Level 3: Transaction/Transactional e-Government

This type of website is the evolution of e-Government initiatives which provides transaction. These initiatives are more complex than simple information provision and embody the type of activities popularly associated with e-Government. They enable public to complete entire tasks electronically at any time of the day or night. These initiatives effectively create self-service operations for tasks such as licence renewals, paying taxes and fees, and submitting bids for procurement contracts.

TABLE I. LEVEL OF E-GOVERNMENT AND ITS FEATURES [6]

Level of e-Government	Features/Indicators
Publishing/Informational e-Government	<ul style="list-style-type: none"> <li>• Government website is just set up</li> <li>• Independent or interlinked websites</li> <li>• Availability of static-dynamic and professional information</li> <li>• government publication, laws, regulations and ordinances, and news on the website</li> <li>• Availability of the feature of searching and related e-mail addresses</li> <li>• Availability of hyperlink to several government agencies</li> </ul>
Interaction/Responsive e-Government	<ul style="list-style-type: none"> <li>• Availability of forms and applications form government websites for accessing by users</li> <li>• Availability of communication features to support interaction between government officers and visitor/public (via e-mail and networks)</li> <li>• Availability of professional database to public find their information needs</li> <li>• Website contents are updated regularly</li> </ul>
Transaction/Transactional e-Government	<ul style="list-style-type: none"> <li>• Online processing of user transaction such as commercial transaction, online forum, online voting, or allowing reviewing online results of opinion polls.</li> <li>• Application of digital signature</li> <li>• Availability of information security warranty</li> </ul>

### C. Analysis SWOT

SWOT analysis is one of method to identify strategic planning by evaluating rapid changing of organization external factors (i.e. threats and opportunities) and organization internal factors (i.e. strengths and weaknesses) [7]. Identified factors of strategic planning are developed based on proper action plan issues so that it may focus on the strengths and eliminate the weaknesses or exploit the opportunities and counter the threats [8].

### D. Web Scraping Technique

Web scrapping or Web harvesting or also called Web data extraction is the techniques to acquire some information from the content of Web pages automatically and generates them into the Web pages (well known as "scraper site") [9][10][11]. There are many methods to scrap information from the Web [12]. One of them is by implementing the CURL module that allows PHP applications to access remote HTTP and many other resources in a uniform fashion [13].

## III. REQUIREMENT PLANNING

### A. Analysis SWOT of As-Is e-Government Website

The SWOT is divided in four components, including strength and weakness as internal parameters and opportunity and threat as external parameters. The analysis is summarized below:

1) *Strength*: The as-is website is regularly maintained by The Centre for Data and Information System, so that problem regarding website can be monitored and solved quickly.

2) *Weakness*: Structure of the as-is website is totally simple. Furthermore, it was presented passive of information and looked like a brochure. In addition, the features are limited just providing to upload and publish documents and articles. Other weakness is because of as-is website integrated into one domain, in hence, all the visitors must to access main domain at the first and then click several menu to find Directorate of Regional Autonomy web pages.

3) *Opportunity*: There is fund to develop new websites which is offered by AIPD. This is also supported by all staff and stakeholders of Directorate of Regional Autonomy.

4) *Threat*: Growing number of cyber-crime is a potential threat for e-Government website, so that website must be regularly maintained.

### B. Summary of Interview and Focus Group Discussion (FGD)

The interview and *focus group discussion (FGD)* was conducted to gather all needs regarding to-be website e-government development. The result of those activities is shown on Table II.

TABLE II. RESULT OF INTERVIEW AND FOCUS GROUP DISCUSSION (FGD)

Characteristics	Description
End-User	The back-end website will be accessed and be operated by an administration staff of Directorate of Regional Autonomy, <i>Ministry of National Development Planning</i> . Then for the front-end website can be accessed by all people without exception.
Contents	The published content of website encompass news, agenda, downloaded files (official documents), announcements, photo gallery and employee data.
Categorization of Published Official Documents	<p>a) Regulation</p> <ul style="list-style-type: none"> <li>• The Law (Undang-Undang)</li> <li>• Government Regulation (Peraturan Pemerintah)</li> <li>• Presidential Decree (Peraturan Presiden)</li> <li>• Joint Circular (Surat Edaran Bersama)</li> <li>• Ministerial Regulation (Peraturan Menteri)</li> <li>• Ministerial Decree (Keputusan Menteri)</li> <li>• Circular of the Minister (Surat Edaran Menteri)</li> <li>• Guidance / Procedure</li> </ul> <p>b) Publication</p> <ul style="list-style-type: none"> <li>• Institutional Regional Government (Kelembagaan Pemerintahan Daerah)</li> <li>• Local Government Reform (Aparatur Pemerintahan Daerah)</li> <li>• Local Government Finance (Keuangan Daerah)</li> <li>• Other</li> </ul>

Characteristics	Description
	c) Studies d) Data <ul style="list-style-type: none"> <li>• Institutional Regional Government (Kelembagaan Pemerintahan Daerah)</li> <li>• Local Government Reform (Aparatur Pemerintahan Daerah)</li> <li>• Local Government Finance (Keuangan Daerah)</li> <li>• Other</li> </ul>
User Interface Suggestions	<ul style="list-style-type: none"> <li>• The website design should not be too rigid and use non-attractive colours</li> <li>• Structure or layout on the front page should not be too dominated by image slider</li> <li>• The recommended colours are adapting Bappenas colour logo, blue and red.</li> <li>• The website can be used as references:  <a href="http://www.djpk.kemenkeu.go.id/">http://www.djpk.kemenkeu.go.id/</a> and <a href="http://www.upenn.edu/">http://www.upenn.edu/</a></li> </ul>

#### C. Needs Analysis to Increase Level of Measurement for e-Government Website

Based on measurement for e-Government followed the World Bank's standard measurement, the as-is e-Government website is still on Level 1 (Publishing/Informational e-Government). The justification regarding this is while as-is e-Government website just providing lists cursory information about an Directorate of Regional Autonomy, such as hours of operation, mailing address, or phone numbers, but has no interactive capabilities. In addition, the purpose of shifting the as-is e-Government website to to-be e-Government website is to change the level of measurement from Level 1 to Level 2. Because of this, the highlighted future features encompass:

- Feature to provide updated official documents
- Feature to provide the ease for updating content regularly
- Feature to provide the interaction between the visitors and staff
- Feature to retrieve data or information from other e-Government website

#### IV. USER DESCRIPTION

User description presents the requirements are detailed by taking users feedback. The use case modeling has presented on Fig. 1, which is depicted formal functional requirements.

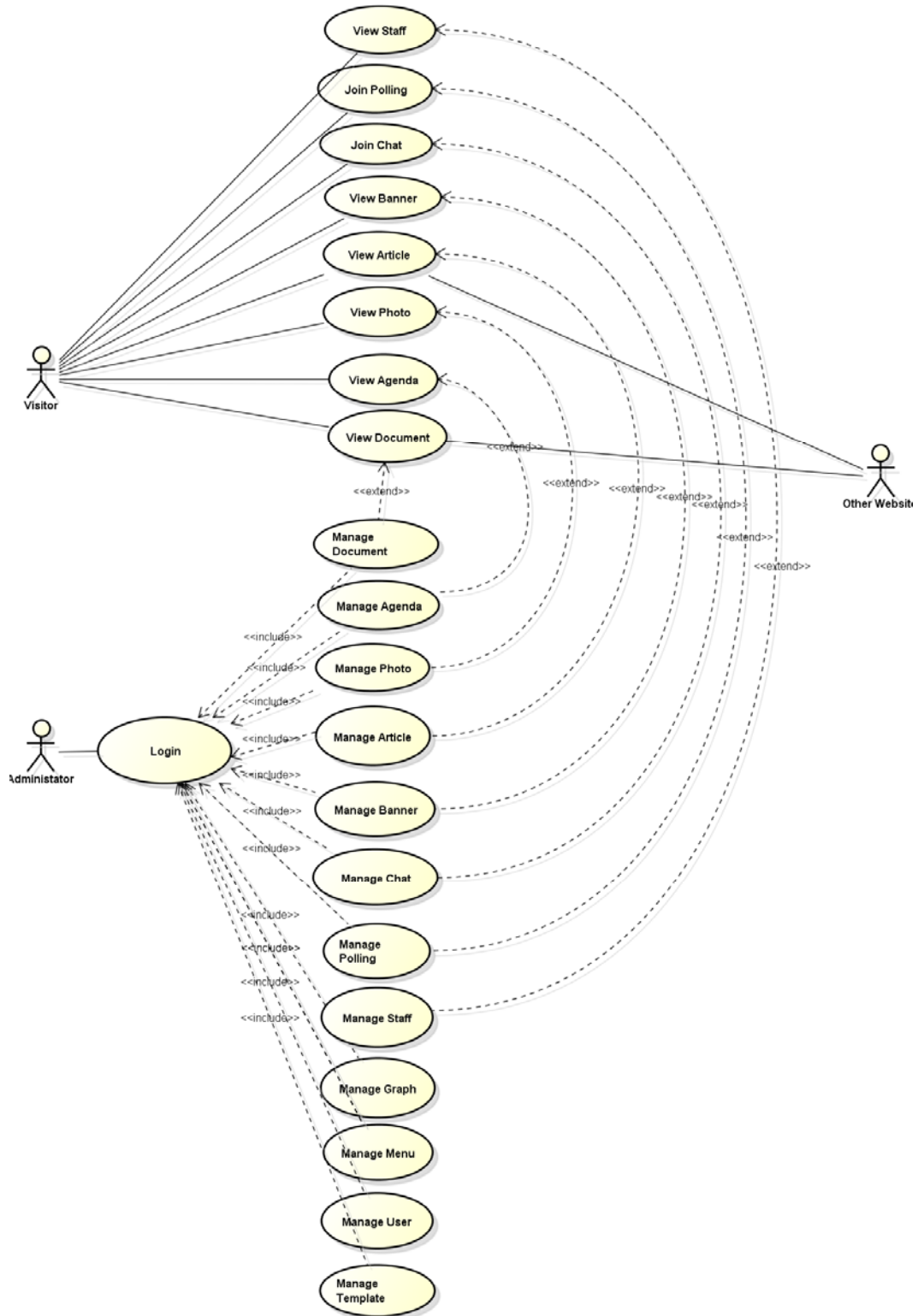


Figure 1. The Purposed Use Case Modelling of e-Government Website

A Use Case represents a discrete unit of interaction between a user (visitor, administrator and other website) and e-Government website. Each Use Case describes the functionality to be built in the proposed -Government website, which can include another Use Case's functionality or extend another Use Case with its own behavior.

## V. CONSTRUCTION

### A. Architecture of To-Be e-Government Website

In this study, we propose the architecture e-Government website for Directorate of Regional Autonomy as depicted on Figure 2.

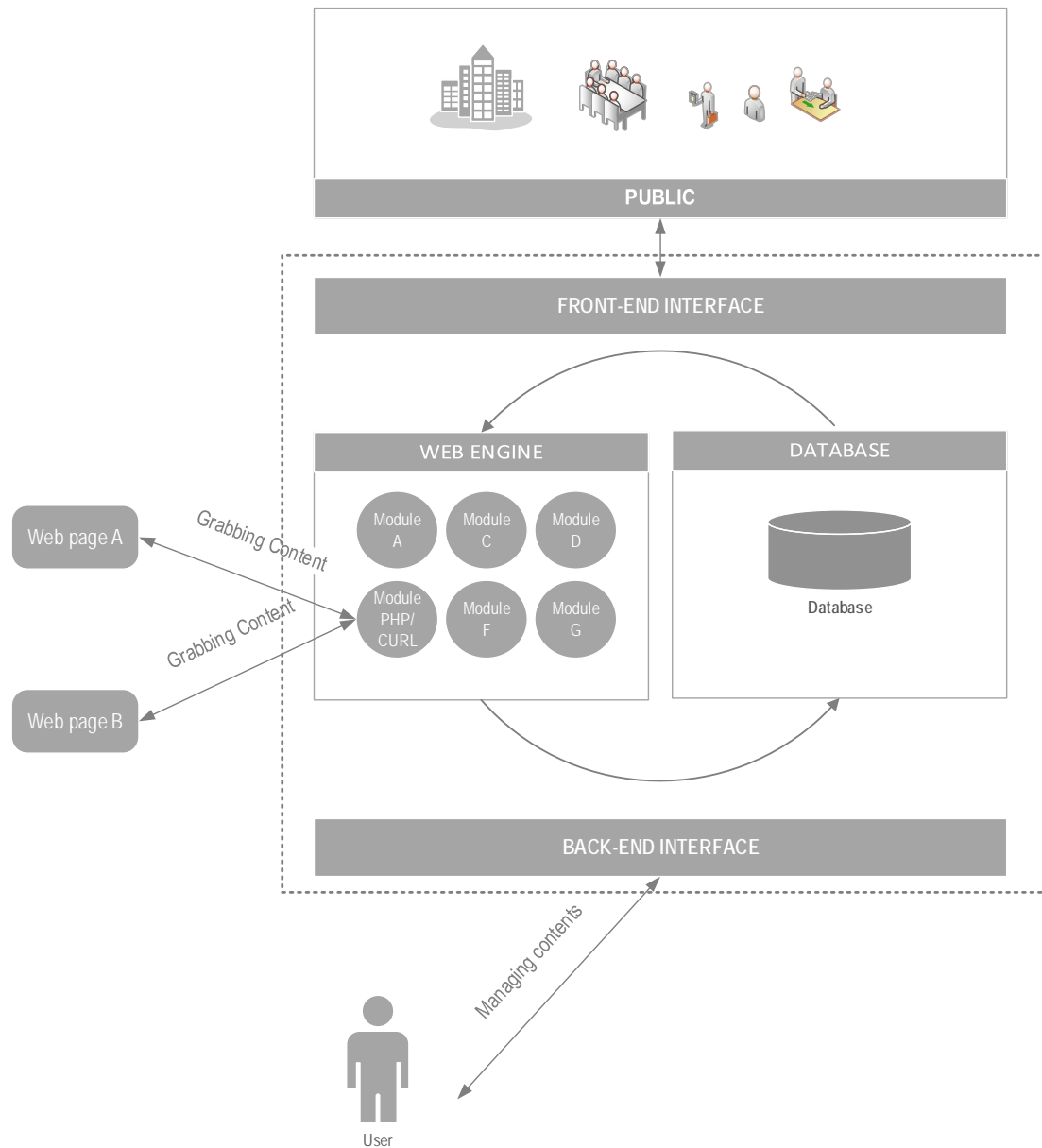


Figure 2. Proposed Architecture of e-Government Website

Content of purposed e-Government website is not only retrieved from database but also by do grabbing other web page, e.g. Ministry of Finance website, through CURL module. It is to reduce the cost to upload similar content while the content has published on other websites.

### B. User Interface Design

Structure of interface design e-Government website of the Directorate of Regional Autonomy was combined text, tables and images. Generally, there are two forms of interface design, i.e. front-end and back-end interface design.

#### 1) Front-end Interface Design

To design front-end interface, as shown on Figure 3, is utilized software named Microsoft Visio 2003. The website used "Bahasa" as main language and fully showed information, such as news updates and newest published documents.

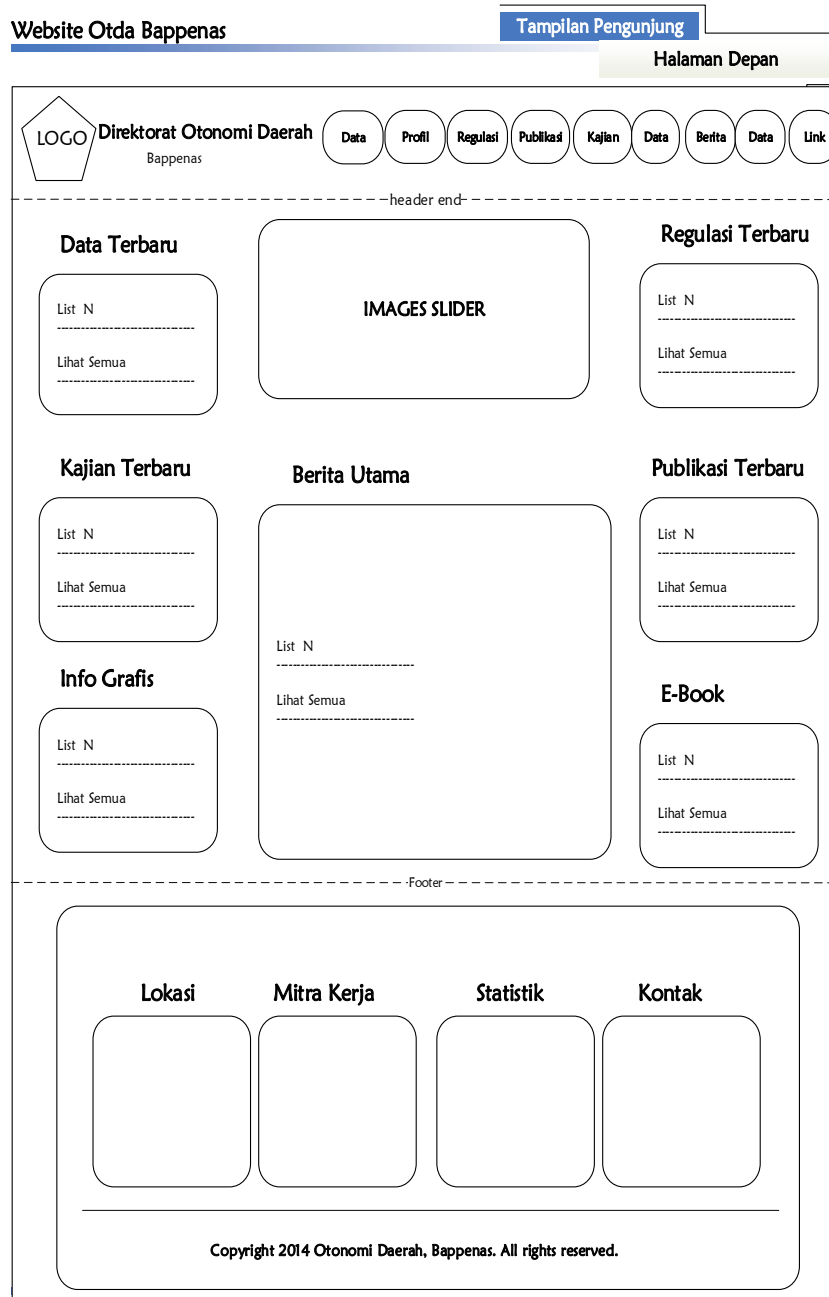


Figure 3. Front-end Interface Design

Concept design of front-end interface was dominated by slider component, box shapes and various colours. When the visitor selected menu *news*, then will show news list which is ordered by the date of publication. If the visitor wants to find news, so they can use the feature of *searching news* on sidebar of news page. The website is more interactive by offered *comment box* and *contact box* to ease the visitors do contact to Directorate of Regional Autonomy staff.

When the visitors selected menu *agenda*, it would appear the to-do list that is sorted by date of published agenda. The visitors can see more detail the agenda, i.e. the place and the time of agenda. For some other web pages have the similar interface design, but the simply different is on the interface design of documents resource web page.

## 2) Back-end Interface Design

The back-end interface design can be seen in Figure 4. On the right side there is a *menu*, to provide direct access for managing contents, including news, articles, documents, comments and so forth.

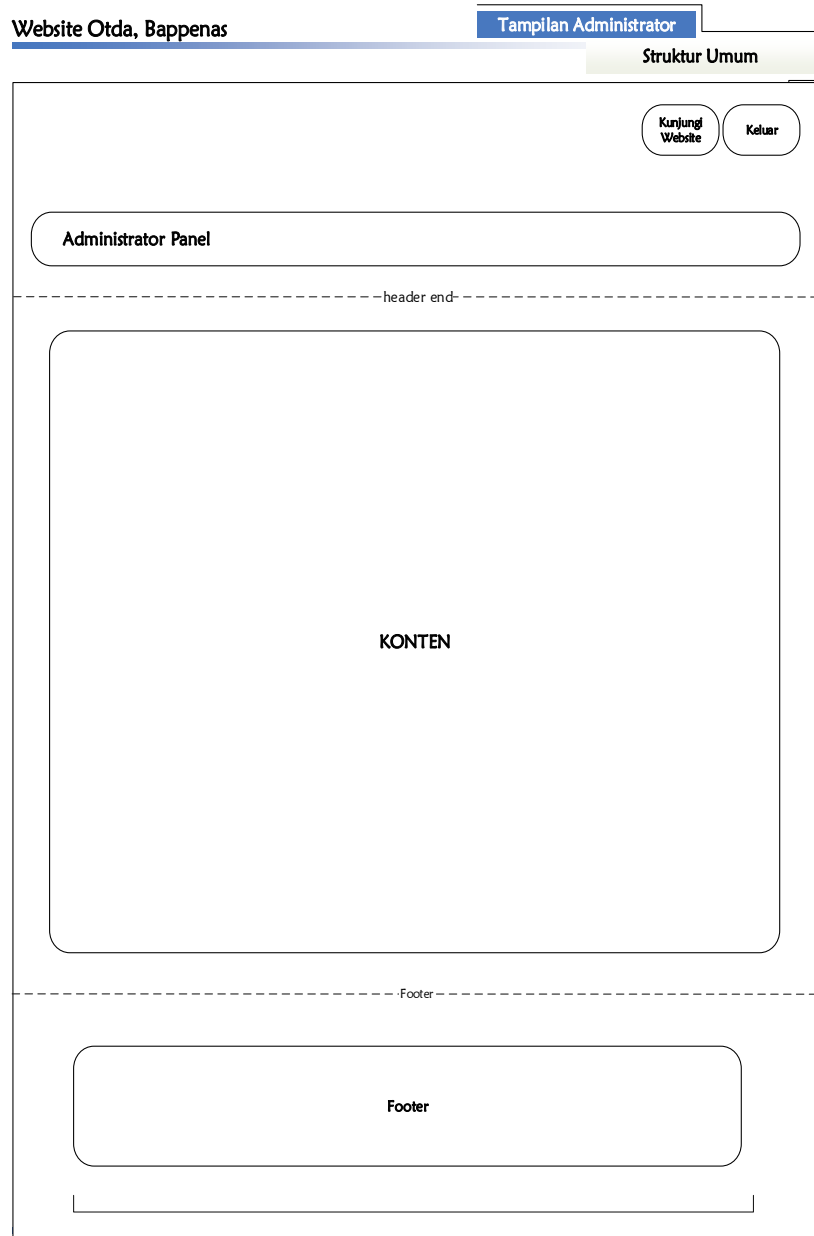


Figure 4. Back-end Interface Design

## VI. CUTOVER

This stage is attempted to implement or translate the requirement into the codes that used the programming languages, i.e. Cascading Style Sheets (*CSS*) and *HTML* (HyperText Markup Language) to construct front-end, MySQL as *database management system (DBMS)*, and PHP (Hypertext Preprocessor) and JavaScript as data processor. The implementation of front-end interface e-Government website can be seen on Figure 6 as well as back-end interface can be seen on Figure 5.



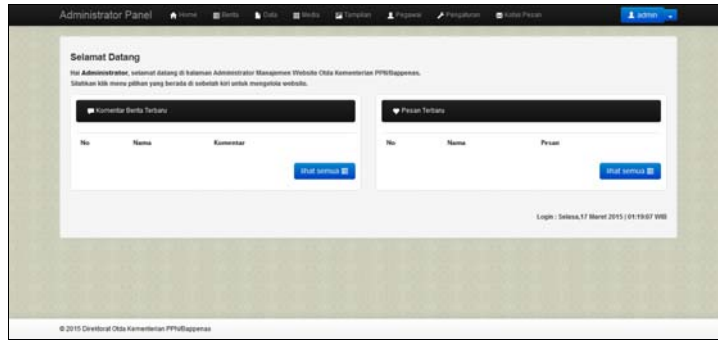


Figure 5. Back-end Interface e-Government Website



Figure 6. Front-end Interface e-Government Website

## VII. CONCLUSION

The process of analysis and design e-Government website of Directorate of Regional Autonomy has been completed. The use of the PHP, HTML, JQuery and CSS to build this e-Government website. The website scrapping technique has implemented to complete and integrate e-Government website involving different government entities by gathering the HTML page of other website with the aim of improving government services. Based on indicator of the measurement for e-Government followed the World Bank's standard measurement, the e-Government has increased from Level 1 (Publishing/ Informational e-Government) to Level 2 (Interaction/ Responsive e-Government).

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