Enhancing Permit Status Checking for the Integrated Public Service Information and Reporting System Application

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Abstract

The district government of Sanggau already has a public service mall (MPP), which is used by all agencies as a place of service. SIPADU (Integrated Public Service Information and Reporting System) is the name of this application, which has various features to meet the needs of MPPs (Public Service Mall). Currently, users of the SIPADU application find it difficult to check the status of permissions. Users must first complete the authentication procedure in order to obtain the desired permission status. This research was conducted to implement a solution to make it easier for users to check the status of the submitted licensing by building a web-based system that will search for the data without requiring login authentication. The analytical methods used include Literature Study and Interview. The design method used is the waterfall method with 6 stages of the process, namely Planning, Analysis, Design, Implementation, Testing, and Verification. The result of this system is a website that can check the status of the permit being submitted. The results of the User Interface evaluation are following the provisions of the Eight Golden Rules method and the results of the evaluation of system testing using the BlackBox testing method with the results showing 100% no errors occur so that it is very suitable for use by users. This study applies the Web Scraping method using PHP scripts and using the Apache Web Server to obtain all licensing data using authentication data provided by PT Media Visual Group so that all users of the SIPADU application can track licensing.

Keywords: Public Service Mall, PHP, Apache Web Server, Web Scraping, Waterfall

1. Introduction

Everything is brought up to date with the advent of globalization. Since access to the internet has rapidly become one of the fundamental requirements for modern living. Users can quickly and easily obtain information regarding a wide variety of topics on the internet. activities like studying, working, communicating, looking for work, and shopping are examples of such activities. The presence of the internet can have a good influence, if it is used appropriately. This beneficial consequence comes with its

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own set of obstacles, particularly about the dissemination of public information that is required by the community. For this reason, the government is obligated to be able to keep up with the present development of the times, which is characterized by using technology in all aspects of people’s lives, including the administration of government activities. This is a requirement that must be met.

Concerning the community, the government, in its role as a provider of public services, is obligated to be able to convey through the official channels at its disposal any public policies that are directly relevant to the requirements of the community. The official website of the government is considered to be one of the official channels that serves as a medium for the dissemination of information regarding public services (Irawan & Nizar Hidayat, 2021). One example of an implementation of electronic government is the availability of an official government website. Electronic Government, also known as e-government, is the application of appropriate Information and Communication Technologies (ICTs), most notably the Internet, in public administration with the intention of improving the delivery of government public services and facilitating citizens’ interaction with the government and its agencies (Mensah & Mi, 2017).

There is already a public service mall (MPP) under the jurisdiction of the Sanggau district administration. In Malaysia, an MPP serves as a location of service for all government agencies. The sort of action that somebody performs while providing customers is referred to as a service. The public at large, on the other hand, refers to the people who make up society, which is connected to the nation, state, or community. To carry out their responsibilities and obligations in the field of investment and one-stop integrated services, public service malls, also known as public service mall (PSM), are formed by regional apparatus organizations, and placed in dedicated buildings. This application is known as Integrated Public Service Information and Reporting System (SIPADU), and it contains a variety of functions that are designed to cater to the requirements of MPP (Public Service Mall). The capabilities of this application serve to make things simpler for users of MPP while also facilitating the provision of transparent data to public users (Public Service Mall).

The SIPADU program does not currently provide users with a way to check the current status of permissions because this licensing status data is owned by a government application that can be found at the URL (Uniform Resource Locator) "https://sicantik.go.id". Because this application requires login authentication using a username and password, no other program or user will be able to verify the rights
status data unless they have both a username and a password. This restriction is in place to prevent unauthorized access to the data. The application does not provide an API (Application Programming Interface) to get all the data from the user, and to get data from the application itself, login authentication with a username and password is required. Based on the problems, the author has been asked to add a licensing tracking system feature to the SIPADU application. The data in this feature belongs to the government application contained in the URL https://sicantik.go.id. We use the Web Scraping method to get data from the URL "https://sicantik.go.id." This authentication is provided by MVG Ltd. and allows all users of the SIPADU application to track permits. To get data from this URL, we use a username and password that have been provided to us by MVG Ltd.

High hopes are held that users would be able to check the status of permissions without having to go through the login procedure if this licensing status tracking module is implemented. Previously, users were unable to complete the authentication process on their own because the data should be generally accessible and checking them should be possible for all users without having to go through the authentication process.

Previous study (Syaifudin, Syafiandini, & Prisadana, 2018) explains a four-step procedure consisting of a literature study, data gathering from e-commerce websites using a technology called web scraping, implementation, and testing, serves as a source of inspiration for our research. Syaifudin et al., (2018) also provides an overview of the methodology. The feature that was developed as a result includes a home page that enables users of laptops to enter search phrases to obtain relevant results, as well as a separate page that is dedicated to presenting those search terms. The outcomes of the study are displayed in the form of a dashboard, which displays search results pertaining to laptops that were pulled from a variety of online merchants.

Another study that is pertinent is (Mulyani, Kurniadi, & Hakim, 2021), which applies the approach of the Rational Unified Process (RUP) to the software development lifecycle. RUP is a system development process that covers the entirety of the software development life cycle (SDLC) and provides a method for assisting the roles and responsibilities of an organization's development process. RUP was initially developed and continues to be maintained by Rational Software, which is also responsible for its inception. The conclusion should be a piece of high-quality software that is not only useful for the task for which it was designed but also affordable priced, taking into account the amount of both time and money that was committed (Zaenal
Hakim & Robby Rizky, 2018). This approach incorporates the phases of conception, elaboration, building, and transition into its overall framework. The completed product is an application for Android devices that presents a collection of articles that have been obtained from the server. The results of this research will be presented in the form of a client/server architecture, which will include a REST-API and an Android-based digital media application.

Previous research (Afifa, 2018) employed a methodology with five stages that included a literature review, followed by analysis and design, development, testing, and documentation. An RDF triple consists of a subject, predicate, object, and relationship, and it is utilized as a component of the architecture for the purpose of constructing an ontology (Himawan, Harjanti, Supriati, & Setiyani, 2020). The outputs are represented as RDF triples, which stands for Resource Description Framework triples. After the data has been extracted, it is next converted into RDF format to simplify the process of ontology construction. This research will produce a drug-specific Resource Description Framework (RDF) and RDF Schema with structured data and data-relationships that have the potential to be utilized in the ontology's infrastructure design.

Another notable study is (Pramana & Munggana, 2015), which addresses the underlying problems by using the System Development Life Cycle (SDLC), the Rapid Application Development (RAD), model, and the application design strategy. When you adopt RAD, the process will take you through the following stages: requirements and planning, user design, building, and handoff. The finished product is a website that obtains its information from official sources, such as databases kept by educational institutions and governmental organizations (census data from Ban-pt and data.go.id). The findings of this study will be made publicly available on a website that may be searched to be of assistance to the government of Indonesia in its efforts to guarantee that all citizens have access to an education of sufficient caliber. Users will be able to search for schools of their choosing using the app that ultimately results.

Mitra, Sujaini, & Negara (2017) studied that is relevant to this topic and makes use of the HTML DOM approach. This is going to be devoted to the creation of a corpus in both Indonesian and English. in addition to the BlackBox method for evaluating this software. The finished product is a website with a dashboard page that displays the number of sentences stored in each language's database, as well as the number of Indonesian and English flags displayed in each box to indicate the language position, and two buttons that can be used to download parallel corpus data from the database. The number of sentences stored in each language's database is displayed.
as a percentage of the total number of sentences in the database for that language. as well as a page that is capable of automatically grabbing everything, complete with buttons to begin the process of grabbing data, delete all links, delete all data, and start the process of grabbing data. The research ultimately resulted in the creation of an automated system that is now capable of effectively establishing a parallel corpus to enhance the resources already available in the corpus.

2. Research Method

The authors construct a research flow that follows the guidelines for creating a good and proper thesis in order to acquire good research, which is obtained through research that is both measurable and guided. Beginning with the very first stage, which entails locating the source of the issue, and continuing all the way through the very last stage, which consists of drawing conclusions. The waterfall approach is the one that is utilized when the development of information systems is carried out. One of the most well-known approaches to software development is called the Waterfall Model. This model was the first one that was adopted, and even now, huge corporations and government initiatives frequently use this model. Because this approach places a strong emphasis on planning in the preliminary stages, flaws in the design will be discovered in the preliminary stages. Since this approach also places an emphasis on the significance of documentation, it is well suited for use in projects that place a high priority on quality (Pangestu, Aliento, & Wijaya, 2012). Planning, analysis, design, implementation, testing, and verification are the stages that make up this research project's application of the waterfall paradigm. The flowchart that follows provides an explanation of the steps involved in doing research:

Source: Research Result (2023)

Figure 1. Flowchart of Research Stages
The issues that are now plaguing SIPADU Application are brought to the reader’s attention by the author. The author conducts further investigation into the issue in order to investigate the system and acquire the data required for the preparation of this research by utilizing data collection methods, specifically unstructured interviews and literature studies. This allows the author to obtain the information necessary for the preparation of this research. Some information regarding the needs of the SIPADU application was obtained as a result of interviews that were conducted with the IT Manager. At this time, it is necessary to provide an open tracking feature for user licenses in order to ensure that all users are able to make permits such as permits to establish general practitioners. At the moment, the procedure for obtaining a license is carried out manually through a government application known as SICANTIK.

In addition, the procedure for collecting data is also carried out manually, and the SICANTIK application does not provide access to online tracking of the licensing status. Reading scientific works and articles found online, in books, and in journals are all part of the "literature studies" that are carried out as part of the process of analyzing the processes that were used in the production of the licensing tracking system by means of the web scraping method. These "literature studies" are carried out as part of the "web scraping method." In addition to this, a study of previous research and applications that are quite comparable is performed. One of these is a search application for laptop sales that makes use of web scraping technologies. This application's goal is to collect data on laptop sales from all of the many markets available, such as Bukalapak, Lazada, and Elevania. Users of this application have access, under a single application dashboard, to a wide variety of new and used laptop references gleaned from a variety of online store applications. In order to retrieve data, this application makes use of a technique known as web scraping, which is implemented within their respective online store applications by way of the Yahoo API. An application programming interface (API) is an interface that allows a program to access other applications or services. Because of the application programming interface (API), developers are able to access pre-existing functionality from other apps, eliminating the requirement to start from scratch (Kurniawan, Humaira, & Rozi, 2020). Applications are able to get HTML data and its meta-data using the Restful API with the help of the Yahoo API. This allows the apps to handle the data so that it is usable. The PHP programming language and the MYSQL database are both utilized by this application. Laravel is the framework that is utilized, and MVC, which stands for Model View Controller, is the way that is implemented as the data management
architecture. Laravel is one of the most popular PHP frameworks that is based on the MVC idea (Model View Controller). While developing applications, adopting the Laravel framework results in cost savings in both the initial development and ongoing maintenance phases (Merdisando, 2018). Model View Controller, also known as MVC and shortened as MVC, is a method for developing an application that separates the data (Model) from the view (View) and the means by which it is processed (Controller) (Yesputra & Marpaung, 2018).

The subsequent stage is the stage of planning, which explains the estimation of the technical tasks that need to be carried out, the risks that can occur, the resources needed to create the system, the work products that need to be produced, the scheduling of work that needs to be carried out, and the tracking of the system work process. The modeling step comes after this one. At this point, the data structures, software architectures, interface displays, and program algorithms are being designed. This is the system architecture design and modeling stage. The purpose of this exercise is to have a deeper comprehension of the overall plan for the work that will be done. The building stage comes after the design stage. During this step, the process of transforming the design form into a code or language form that can be read by a machine takes place. Testing is performed not only on the finished product but also on the code that was developed once the coding phase has been completed. The objective is to identify potential flaws so that they can be fixed at a later time. The final stage is the stage of software implementation to customers, which includes the stages of software improvement, software evaluation, and software development depending on the feedback supplied. This ensures that the system can continue to run and evolve in accordance with its role.

3. Results and Analysis

3.1. Use Case Diagram

Use-case diagrams are made when gathering and defining needs for the system (Dennis, Wixom, & Tegarden, 2014). Use-case diagrams offer consumers a clear and uncomplicated approach to express what the system will do, and use-case diagrams are drawn when gathering and establishing requirements for the system. The menu for tracking licensing is shown in Figure 2. The following is a Use Case Diagram of that menu.
The features that users have access to are displayed in the licensing tracking menu, which can be seen in Figure 2. Here, users can search for data on their licenses and check the details of the status of licenses that have been processed to what level.

### 3.2. Class Diagram

In the design model of a system, the relationship between classes, complete with an in-depth explanation of each class, is referred to as the class diagram. This diagram also displays the rules and responsibilities of entities, which dictate how the system will behave (Hendini, 2016). Figure 3 presents the class diagram of the system for your viewing pleasure.
Both the TrackingPerizinanUI class and the TrackingPerizinan class can be seen in Figure 3. The user interface for the permission tracking menu is handled by the TrackingPerizinanUI class. The function of the TrackingPerizinan class is to manage the flow process so that it can be presented on the user interface.

3.3. Entity Relationship Diagram

The Entity Relationship Diagram, also known as an ERD, is a model-based approach tool that states or describes the relationship between several models. According to what is stated in this relationship, the most important function of the ERD is to display the data objects (Entity) and relationships (Relationship) that are present in the following Entity (Mulyana & Ropianto, 2021). Figure 4 presents the entity relationship diagram of the system for your viewing pleasure.

![Entity Relationship Diagram System](image)

Source: Research Result (2023)

Figure 4. Entity Relationship Diagram System

It is clear from looking at figure 4 that the tracking permission meta-Table, also known as the User Table, has a relation that is one-to-one with the tracking permission Table.

3.4. Interface Design

As a consequence of the operation of this system, a number of different displays and functionalities are available for usage. They include the Licensing tracking page, the Permit validation warning page, the Licensing data search results page, and the Detailed permission status page. On the licensing tracking page, you will be asked to input either the code from the authorization letter or the full name of the person who is applying for the permit.
A licensing tracking page is depicted in figure 5. The licensing tracking page includes two different sets of data: those pertaining to licensing through SiCantik and SIPANTAU. If the user goes through SICANTIK, the SICANTIK program will provide them with data that was gathered from the results of scraping websites. If the user goes through SIPANTAU, the data they need will come from the application that Sipadu maintains internally. SIPANTAU is necessary for the acquisition of various sorts of permits, as shown in Figure 6 Permit Validation warning.
A warning for the Permit Validation can be observed in Figure 6. To monitor a client, a minimum of three letters from the full name of the licensing applicant or the license letter number must be entered. Alternatively, you can directly enter the license letter number. A notification will appear for users if they input data using less than three letters. Official permits, like a General Practitioner’s License, Pharmacist Permit, or Midwife Permit, among others, are primarily processed using the SICANTIK application. Additionally, certain permits are directly managed by the Sipadu team.

When user want to track a customer, you must enter at least 3 letters of the full name of the license applicant or the number of the license letter. If the customer enters data in less than 3 letters, a warning.

Source: Research Result (2023)

Figure 7. Licensing Data Search Results Page and Detailed Permission Status Page

The user can validate his or her license data and select the Details button in order to examine the current state of his or her license once the username that is being searched for has appeared in the data list.

A table will be displayed as the status of the permission letter from the user. The table will contain information on the stages of the process, the status of the process, the user who carried out the process, as well as the date and time the process was carried out.
Table 1. Blackbox Testing

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Expected Results</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take all data for licensing letters with keywords that have been entered by the user</td>
<td>Generate permission letter data based on the user's keywords, if the data does not exist then the contents of the table must be empty</td>
<td>Succeed</td>
</tr>
<tr>
<td>Pressing the detail button on the table</td>
<td>Displays details of the status of the permission letter that the user clicks on from the beginning to the latest process stage</td>
<td>Succeed</td>
</tr>
<tr>
<td>When the search word is less than three characters</td>
<td>Does not display data and displays an error that the search word must be more than three characters</td>
<td>Succeed</td>
</tr>
</tbody>
</table>

Source: Research Result (2023)

Because the results of the tests, which were carried out by an in-house team of ten people and were successful following the sorts of tests described above, lead us to believe that the accuracy and success rate of web scraping are both 100%, we draw the following conclusion.

4. Conclusion

The results of the analysis, design, and implementation of the tracking function of licensing letters in the SIPADU application (Integrated Public Service Information and Reporting System), allow for the following conclusions to be drawn: first, the SIPADU application aims to make it easier for all Public Service Mall users to get information; however, as of right now, the SIPADU application does not yet have a tracking function for the user’s license letter; therefore, in order to check the licensing information, the user must c. As a result, the Licensing Tracking module was developed to facilitate an easier method for clients to examine the current standing of their licenses. Second, the License Tracking module is built with the computer language PHP and the MYSQL database. These two components work together to create the module. This particular module makes use of Laravel as its framework and implements the Model View Controller (MVC) approach. UML Diagrams are utilized throughout the design process. These diagrams may include Use Case Diagrams, Activity Diagrams, Sequence Diagrams, Class Diagrams, and Entity Relationship Diagrams (ERD). The primary goal of developing this module is to simplify the process by which users can determine the current status of their licenses by utilizing the
SIPADU application. Third, the License Tracking module has been developed with a User Interface that is quite straightforward in order to ensure that users have no trouble making use of it. The production of this module also involves reducing the number of errors brought on by both users and the system. The findings of the Black Box Testing carried out by internal parties led us to this conclusion. These tests revealed that the program in question did not include any flaws; as a result, it was suitable for usage by consumers.

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Author Contributions

Farhan Mubarak, Rehan Choirul Rohily, and Sahtia Murti proposed the topic; Dwi Listriana Kusumastuti and Yulius Denny Prabowo conceived models and designed the experiments; Emny Harna Yossy conceived supervision and analysed the result.

Conflicts of Interest

The authors declare no conflict of interest.

References


