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Integration of Legalization Information System Web-Based using Shipping API and Telegram API

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Abstract - Education is a right for every citizen. Quality education makes people more intelligent. Educational outcomes documented in a file called a diploma. A diploma is a necessary file for doing things related to work or other administrative matters. Generally, the diploma file submitted is in the form of a photocopy of a certificate that has been legalized for administrative requirements. The process of legalizing diplomas is often a hindrance because the time required is quite long and especially if someone is in an area far from where to take care of legalization. In the industrial era 4.0, information technology can be utilized to facilitate public access to services in the world of education, for example, using technology to implement an online legalization system. Application of technology in the legalization process is not just online but can be integrated with API (Application Programming Interface). It can attract millennial access to the application easily. There are two APIs used, namely the Shipping API and the Social Messaging API. Shipping API makes it easy to check shipping costs based on alumni location. Social messaging API with assistant features so that it can be easier to serve alumni accessing application features via Telegram. This study aims to facilitate the alumni in legalizing online to make time-efficient and affordable—implementation of information systems with the integrated website media Telegram API and Rajaongkir or shipping cost API. Based on testing the usability testing results obtained a value of 4.56 on a scale of 5. These results indicate that the application can function following the needs of users of information systems.

Keywords: legalization, API, social messaging, telegram, web-base

INTRODUCTION

One of the goals of the Indonesian people is to educate the nation's life. Objectives set out to educate the nation on the opening of the 16th paragraph of the Constitution of the Republic of Indonesia Year 1945 [1]. One of the concrete efforts taken to educate the nation's life is to optimize teaching and learning activities in the world of education. The essence of the educational process that reached all the future generation is to foster the potential of religious or spiritual strength, self-control, personality, intelligence, noble character, and skills needed by him, society, nation and state [2]. The output form of the result of learning while studying is proof of graduates who are called diplomas.

Everyone needs to legalize a diploma in completing the requirements to continue their education to a higher level, apply for a job, apply for prospective civil servants, make a passport, or other needs. Legalization is a non-standard form of the word legalization. Authorize the meaning of legalization required by law or statute. Legalizing documents is a way to validate copies of documents. Legalization of documents is carried out on relevant documents that are copied and then authorized by the agency with a signature accompanied by the full name and stamp of the agency.

The procedure for Legalizing is quite easy, namely by making a photocopy of the diploma file and then being asked to legalize it to the school or to the authorities to carry out the legalization of the diploma. In this study discusses the existing online legalization system of high schools / vocational high schools in Kediri rooting from problems that arise if the diploma holders reside far from their original schools and even differ from cities and countries. In the first data collection, it was found that most of the alumni at one of the X High Schools continued their education to tertiary institutions. The problem occurs when an institution/college alumni are outside the Kediri region; then alumni should come to the school to ask for legalized diploma takes time.

Several studies on the topics discussed in this study include Research with Media Integration Postage API conducted by Stefanus Ericko Surya in 2015 with the title Design and manufacture of excellent motorbike e-commerce websites. This study discusses motorcycle sales through e-commerce with the integration of the Postage

API. Users can accept the results of this study information systems with API shipping cost with satisfaction results of 76.5% [3].

Research on the topic of the telegram was carried out by Raga Nufusula in 2018 with the title design chatbot on pulse servers using the telegram bot API. This study discusses the integration of the pulse server with the telegraph social messaging API. The results of this research API can make an introduction to users who have registered as agents and other commands relating to credit transactions. Based on the test results, the telegram bot has run according to the design. Telegram bot that is made can be used as an alternative medium in conducting credit transactions [4].

Kurnia Fitri researched the topic of the legalized information system web in 2018 with the title design of a web-based document legalization information system at the Faculty of Engineering, Padang State University. This study discusses the online legalization system. The system built only uses a web-based platform. The results of this study users can legalize online and monitor the status of legalization [5].

The research that will be carried out combines some of the research previously discussed, namely, by creating a web-based online legalization application with the integration of the social messaging API and the shipping cost API. Application features are built to facilitate alumni in terms of accessing various web platforms and social messaging. The application created can describe the transparency of the legalization process. Alumni can find out the cost and status of submission through the web and social messaging platform.

Optimization features on the application of the system legalized online with the integration of API (Application Programming Interface). The API used is the social messaging API that is used for registration features and some other information. The social messaging API feature was chosen because many millennial generations use social messaging, namely, telegram [6]. Another feature is the Shipping Cost API which is used to calculate shipping costs according to alumni location. The application platform consists of web-based and social messaging platforms.

The social messaging-based online legalization system aims to make it easier for alumni to legalize their relevant documents quickly—the facilities provided by legalizing from a distance outside Kediri. Ease of access must be applied because it follows the industrial era 4.0 [7]. Industry 4.0 optimizes access electronically that must be carried out for the ease and smoothness of bureaucratic system services in educational institutions [8]. The system built is not only limited to online legalization but also integration with social messaging to facilitate alumni access to the legalized system. The benefits that can be given include making the legalization system faster and more comfortable and transparent services. The legalization process can be monitored using a web application or a social messaging application. The system provided facilitates alumni in saving time and money to legalize to increase productivity with administrative matters that require a considerable amount of time.

II. RESEARCH METHOD

Application Programming Interface (API) is a language and message format used by application programs to communicate with operating systems or other control programs such as database management systems (DBMS) or communication protocols. API is an interface that is used to access applications or services from a program. The API allows developers to use functions that already exist from other applications, so there is no need to rebuild from the first step [9].



Fig 1. API ¹⁸

The method used in this study is the waterfall method. The waterfall method is a method of developing information systems that are systematic and sequential [10]. This model is included in the generic model in software engineering, and Winston Royce introduced it firstly. This method is the most widely used in Software Engineering. This method is called the waterfall because step by step must wait for the completion of the previous stage and proceed sequentially [11]. The flow of the waterfall method is in Figure 2

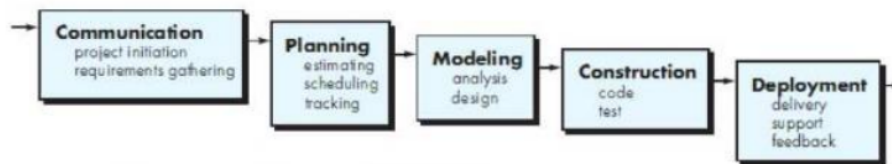


Fig 2. Waterfall Method

The Communication stage is carried out before starting technical work. At this stage, the researcher explores the information needed to build an online legalized information system. The object of research chosen was a secondary school in Kediri. The data needed is in the form of school experience data, especially those directly related to the legalization process, including the administration section and counselling guidance teacher. Researchers also took data from alumni who were in one city or outside the city. Data collected helps define software features and functions. Additional data collection can also be taken from scientific journal references, articles, and the internet. The next stage is the planning stage; the researcher explains the estimation of the technical tasks that will be carried out by the research members and the team. This stage also takes into account the risks that can occur, the resources needed to make the system, the work products to be produced, the scheduling of work to be carried out, and tracking the process of working the system

The next stage is the Modeling and Construction stage. This stage is a system stage that focuses on designing data structures, software architecture, display interfaces, and program algorithms. The aim is to understand better the big picture of what will be done. Deployment stage is the stage of implementing the software to the user, namely the school. At this stage, the researcher will test the system based on usability testing. Software development is based on feedback from users so that the system can continue to run and develop according to its function [11]. Schematic diagram of legalized information system is as shown in Figure 3

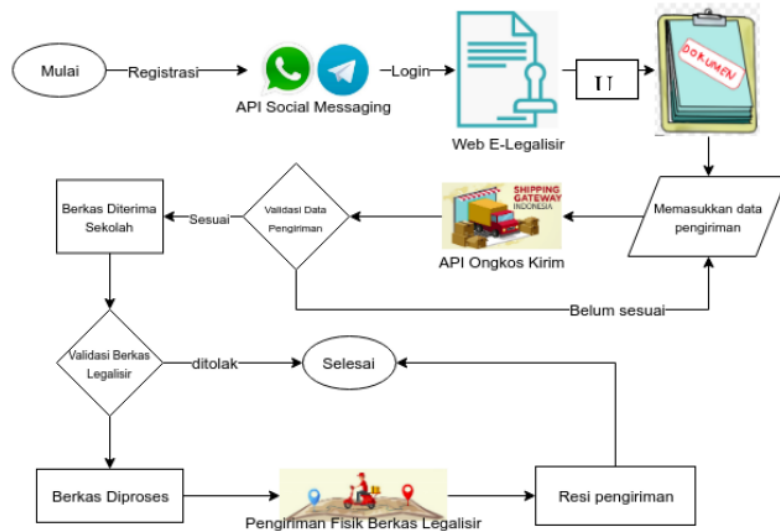


Fig 3. E-legalized system Based Online Social Messaging

The system flow in Figure 3 starts from the alumni registering through a telegraph social messaging bot. In addition to registering for social messaging bots, alumni can also find out users and passwords, check the status of legalized transactions, and find out the latest information from the school. The step after registering is log in to the E-Legalized system to upload documents and fill out forms. After completing the alumni form, enter the delivery destination integrated with the Shipping Cost API. Then the alumni fill out and validate the data; the school will get a notification via the social messaging API and then will validate the legalized file to process the file. After the file is following the school legalization, then the school send the legalized physical file to the alumni address. The school enter the receipt address. Alumni can find out the file processing notification via social messaging.

III. RESULT AND DISCUSSION

The Waterfall model conducted this research. This method uses a systematic and sequential approach to software development that starts at the system level and develops through analysis, design, coding, and testing [12]. This research model is illustrated in Figure 2. The illustration of the Waterfall method can be modified according to the research needs [13].

The steps taken are Communications and Planning by taking data on several research objects in SMA / SMK Kediri. At the communications stage, the data displayed diagrammatically are found using the Flow diagram. The stages of making diagram designs are part of the Modeling stage. The design stage consists of two stages, namely the main diagram design, namely level 0 diagram and web-based interface design using Object Oriented native PHP programming. The main diagram design using Data Flow Diagrams (DFD) will explain the flow system that will be built. DFD Level 0 design drawings show in Figure 4

In the system built, there are two main entities, namely users and operators. Users on the system built represent alumni entities. Operators in the system built to represent the entity of the agency that carries out the task of online legalization system management. There is one new entity, the telegram BOT entity. Telegram bot entities help the tasks of the two main entities namely user entities and operator entities

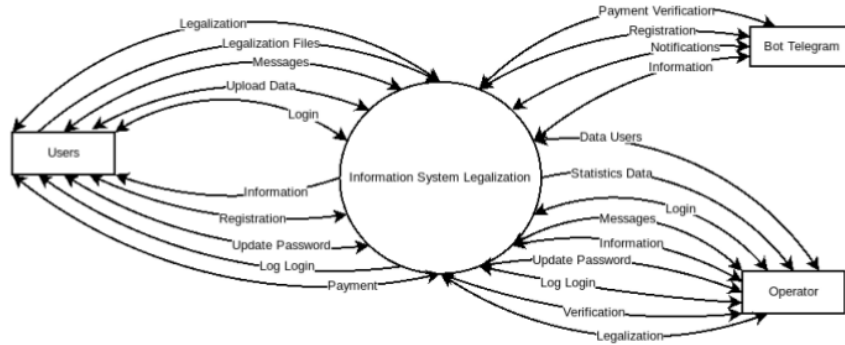


Fig 4. DFD Level 0

The DFD system design scheme level 0 in Figure 4 shows the basic system flow of online legalization. In figure 4, there is a business process for each entity. In the User Entity, there are ten business processes, in the Operator entity, there are nine business processes, and in the bot entity, there are four business processes. User entities can register independently, login, find out various information, fill out legalized forms, send messages, update passwords, upload legalized files, update payment data, and legalizing shipping

There are several business entity operator processes including user data management, logging in, providing information to users, viewing legalized data statistics, updating passwords, sending messages, verifying legalization, and legalizing data management. Telegram bot entities serve as servants for users and operators. The tasks performed by the bot are for the registration, notification to users and operators, and legalization verification. Bots ease the burden on users and operators. Telegram bot offers as an alternative search interface with integrated full-text services [14], [15]. The instant messaging service that is implemented integrates the notification system on smartphone devices, as well as the telephone call system and short message service (SMS). Bot devices can improve communication between users [16]

Figure 5 is a database relations design in information systems. The database uses a DBMS (Database Management System) design. DBMS has the advantage of being one of the system constraints that protect data integration between tables [17], [18] Design Database design is under DFD derivatives. There are six connected tables. The database table design in Figure 5 uses the MariaDB database with the InnoDB engine. InnoDB engine functions as a database relation [19].

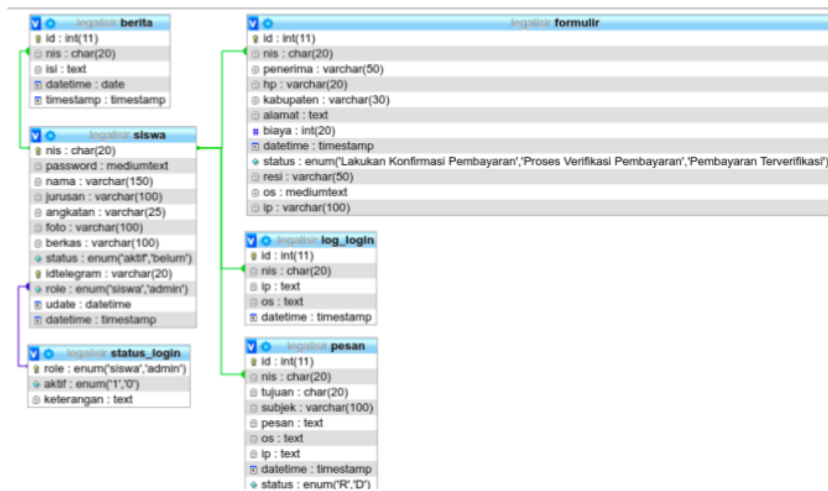


Fig 5. Database System Legalization

The design phase of implementing the information system interface is legalized using a bootstrap framework with the adminLTE template. System login design is in Figure 6. On the system, login interface the user can log in by entering a username and password. Users can register using two methods, namely via bot telegram or web-base

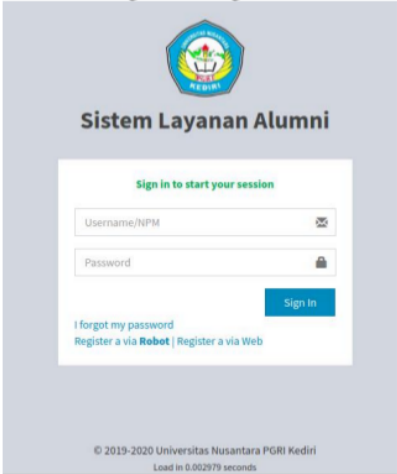


Fig 6. Login System

The code phase is part of the construction phase. This stage uses sublime text version 3 tools. Sublime Text is a text editor used in making legalized information systems, namely web programming languages and database programming. The code structure of the legalized information system consists of two main modules, namely the admin module and the user module, the two modules represent the functions of the primary entity, namely the user and operator. The two main modules consist of various modules that are connected. On the system, there is also an external module which is a module that consists of CSS modules, namely jQuery, bootstrap, awesome and ionic fonts. Program modules consist of PDF, Excel, and server-side data table modules

The dashboard on the legalized information system is divided into two entities, namely users and operators, interfaces in the form of a web-based. Dashboard design is as shown in Figure 7. The difference between dashboard users and operators lies in the menu permissions. Menu permissions such as modules defined in DFD Figure 4

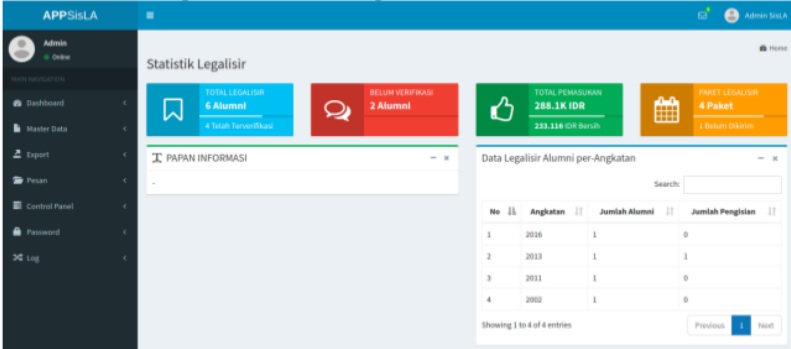


Fig 7. Dashboard System

Telegram bot interface, as shown in figure 8. Some features of the telegram bot interface can be accessed with the keyword "/ help". The features are shown in table 1

Table 1. legalizing Bot Fitur

Command	Function
/daftar	To register for the Alumni Service System. Registration format: daftar#NPM#Name#Department#Graduation Year
/list	To know username and password
/informasi	To know alumni information such as job vacation
/legalisir	To know alumni legalizing list
/pembayaran	To verify alumni's legalizing payment
/time	Current time information
/help	System help information

The features of the telegram bot are adjusted to the results of observation of user needs. Telegram bot is an integration of the telegram API with a web-based information system that uses the Webhook method. This method does not overload the webserver. The bot method will make it easier for users to access information system search studies [6]. The bot model is based on the chat-bot with the interaction of the basic command "/"; the example is in figure 8 [20].



Fig 8. Interface Bot Telegram

The business process interface of legalizing is in Figure 9. This process integrates the shipping cost API with a web-based information system. On this system, the user can legalize with the condition that they have uploaded the file first. File uploaded in PDF format. Users can legalize and interact with the telegram bot to try out the features in table 1

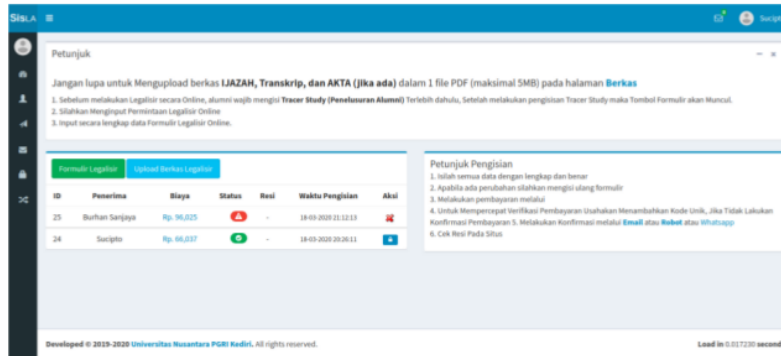


Fig 9. Interface User Legalization

The Legalization process is carried out by filling out the legalized shipping data. Essential data are shown in Figure 10, namely the data recipient's name file, delivery destination, specific delivery address details and cell phone number. The destination of the shipment uses the Shipping Cost API integration, so the nominal shipping costs will appear as shown in Figure 10

Fig 10. Legalization Business Process

The last stage is Deployment. This stage is done by distributing application tests to several questioner samples. The amount of testing data is 60 respondents. The results of testing the legalization of the prototype information system legalization indicate that all functions are running well. The function results use the BlackBox testing method following the stages of communications and planning. Usability testing of the system uses the usability testing method for the level of effectiveness, efficiency and satisfaction. The usability test results are shown in Figure 11

Usability testing at the level of efficiency is the lowest. An influencing factor is that some respondents are not yet familiar with Telegram Bot. Results Testing effectiveness, and satisfaction has good results. It is influenced by the information obtained very easy for respondents. The overall results of testing Figure 11 show that the application can be used well and has excellent satisfaction. Usability value of 4.56 on a scale of 5 which shows that users can accept the information system usability test

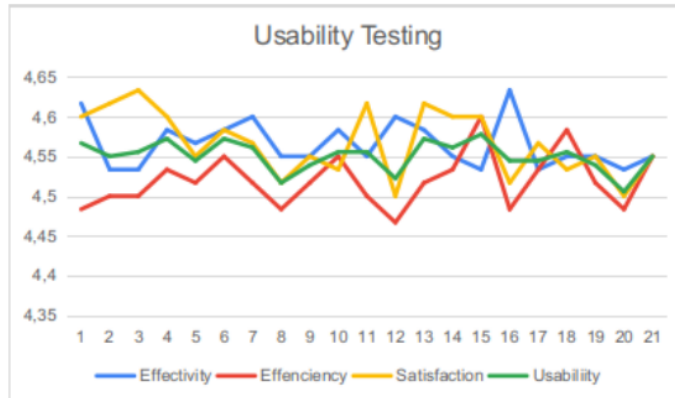


Fig 10. Usability Testing

IV. CONCLUSION

Testing in this study uses the Usability testing method. Usability testing uses three variables, namely effectiveness, efficiency and trustworthiness. Usability testing is used to determine the module and API integration that is built, whether it by under user needs. User needs are the key to the success of receiving information systems. Based on the usability testing results obtained a value of 4.56 on a scale of 5, which shows that the user can accept the information system usability test. There is an essential note that efficiency performance is still lacking compared to other assessments. It is due to the lack of familiarity from the user side of the Telegram Social Messaging API. However, the level of effectiveness of API integration makes users comfortable using this information system.

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