Implementation of The Patas Model in The Development of The Matana University Graduation Information System

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Abstract – There is an urgent need to make a graduation information system at Matana university. This system is needed, especially for students, secretariat, and finance. Several other things to consider, namely the number of participants and the graduation committee are more than 300 people, delegation of system development to one person, many users are still unfamiliar with integrated information systems based on information technology (IS/IT), the Corona pandemic, and can anticipate sudden changes. Therefore, we need a software development model that fits these conditions. The research methods for making this model, such as study of literature, interview, observation, model creating and model testing. This software development model is called Patas (Cepat Terbatas), it is rapid and limited. This model has six phases, i.e., user requirements, selection of devices, modification, evaluation, implementation, and maintenance. This model is then implemented to the development of Matana University graduation information system (MUGIS). MUGIS based on web has been successfully built using the Patas model. MUGIS features prospective graduate registration, payment, sending information to participants (personal or mass) by email, dashboard, privilages user, attendance for graduates by QR Code, change profile and content management. MUGIS is used from graduation preparation to graduation day. Thus, the Patas model can be an alternative model in software development. To use the Patas model, an expert is needed. In the future, the Patas model needs to be tried for the development of a different information system or software.

Keywords – *Patas Model, Software Development, Graduation Information System, QRCode, Web*

I. INTRODUCTION

In 2021, Matana University (MU) will graduate its students. At this graduation, I started to think about utilizing the graduation information system (GIS), inspired when MU successfully held the 2019 SLKI (Seminar dan Lokakarya Kualitatif Indonesia)[1]. The existence of GIS is expected to assist in the capture, process and distribution of data and information from preparation to the event.

The Corona pandemic was still ongoing when the 3rd MU graduation was being prepared[2]. Therefore, GIS is expected to be able to help the presence of graduation participants on the graduation day, to avoid crowds (social distancing) and presence with shared ballpoint. GIS core users are graduation participants, secretariat section, and finance section, where they have access rights to GIS. The secretariat section not only requires data such as profiles of graduation participants along with photos and sizes of gowns and their presence on graduation day, but also sends information or announcements. The finance section requires profile data and payment of graduation participants. Graduation participants need information regarding schedules, invitations, QR Code for presence. It is known that the number of graduation participants and committee members is more than 300 people, many of whom are not used to using integrated GIS. GIS development is delegated to one person, who can anticipate sudden changes or additional needs, where development time is short.

Of course, it is not easy to develop GIS integrated with these conditions. Although there are many models of software development [3], [4], they are not necessarily suitable for the conditions encountered. Therefore, a software development model is needed that is in accordance with the conditions encountered to be able to respond to it and then apply it so that it can produce the desired integrated GIS immediately.

In previous studies, used the Prototyping[1] and Scrum[5] models, but the systems developed and the conditions were different. Several campuses have developed graduation information systems[6],[7],[8], or digital graduation management system[9] . The development of the system not only has a different background or context, but also the development model and its features. Several software development models in Indonesia are mostly carried out using the Waterfall or Prototyping models, rarely developing their own models according to the conditions encountered. Most of the GIS developed are web-based. This is because it can be accessed easily through a browser on personal computers, notebooks, tablets, or smartphones. PHP is a popular programming language in Indonesia for creating web-based programs or applications[10],[11].

The background and context for the development of the Matana University graduation information system (MUGIS) are certainly different. No development model fits the background or context yet. It is necessary to identify it first to determine the successful development model [12]. Therefore, it is necessary to have a suitable model to produce such integrated GIS immediately, MUGIS.

This research resulted in a software development model that was implemented to the development of MUGIS. In addition, a web-based integrated graduation information system was also produced between graduation participants, the secretariat section, and the finance section.

II. RESEARCH METHODOLOGY

The research method used is as shown in Figure 1, consisting of study of literature, interview, observation, model creating and model testing.
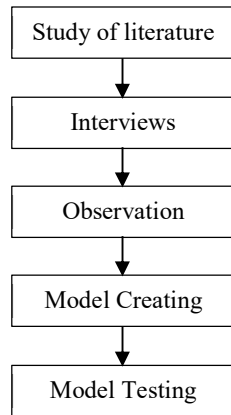

Figure 1. Research method

Study of literature to obtain an overview of previous studies related to the development of MUGIS, software development models and software engineering.

Interview, interviewing several people to find out the needs and specifications of the integrated GIS. Interviewed users, such as committee chairmen, PIC of the secretariat and PIC of the finance.

Observation, observation of related documents, services, software, and hardware available. Observations were also made on several users. Observation results help in determining the tools to be used in development MUGIS.

Model Making, the model is made by approaching the conditions encountered, and the expertise of the delegated person. Many applications do not need to be made from scratch, but can take advantage of applications or programs that are deliberately shared for free on github such as PHPMailer[13], sourceforge such as PHP QR Code[14], books such as creating a CMS[15] or other sites, such as jQuery[16], Bootstrap[17] and of course there are many more that can be utilized. To suit the needs, the application or program that is shared needs to be modified. However, in the model it is necessary to anticipate the additional needs or changes that the user wants. Before implementation, it needs to be evaluated by the user. After implementation, it needs to be monitored for improvements if errors or problems still occur.

Model Testing, the model was tested to be implemented to the development of a web-based integrated MUGIS. The results of this testing will provide useful feedback to improve the model.
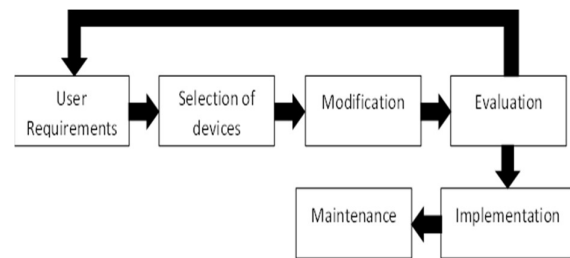
III. RESULTS AND DISCUSSION

Figure 2. Patas model

The model for MUGIS development was successfully created, called Patas. The abbreviation of Patas is Cepat Terbatas(in Bahasa), Rapid Limited (in English), Figure 2. The Patas model has 6 phases, i.e., user requirements, selection of devices, modification, evaluation, implementation, and maintenance. From evaluation, you can return to user requirements to accommodate user needs or changes.

User requirements, this phase is to find out the needs or specifications of the user for the system to be developed. At this phase, the basic and important requirements are first obtained in order to obtain an overview of the system being built.

Selection of devices, based on the requirements and specifications obtained, is then followed by searching for the appropriate devices to develop the system. Example: shared use of open source or free software. Efforts are made to select for the appropriate devices that are easy to learn and have adequate documentation.

Modification, not all the selected tools are in accordance with the needs of the user or developer. At this phase, modifications can be made by adding or removing features, integrating with other programs or applications or systems.

Evaluation, the system that has been built needs to be evaluated. The results of this evaluation inform whether the needs of the user have been accommodated. At this phase, it is possible to return to the user requirements phase to accommodate additional needs or changes that occur. However, instead, it will be passed on to the implementation phase.

At the implementation phase, installation, data migration and training are carried out. After everything is ready and suitable for use, proceed to the maintenance phase.

Maintenance is the final phase. At this phase it is carried out for repairs - minor repairs, data backup.

The following is the result of applying the Patas model to develop GIS at Matana University. Figure 3, is the homepage of the Matana University GIS, which is made in the form of a content management system (CMS) with homepage features, about us, news, galleries, agendas, guidelines, search, and login.

Figure 3. Homepage

These GIS users can login to gain access rights. The login form can be seen in Figure 4. Each user will have their's features.

Figure 4. Form login

Graduation participants have dashboard, profile, registration, and installment payment features, as shown in Figure 5. In the page, graduation participants can input data like graduation service (online or offline), upload receipt of payment/transfer, choose the size of the gown, upload photos and notes to the committee.
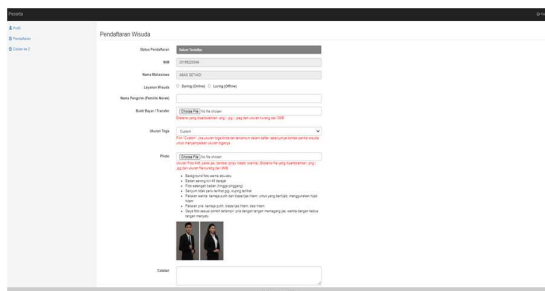

Figure 5. Page for graduation participants

The secretariat section has dashboard features, profiles, info and participants, Figure 6. The secretariat can monitor graduation participants, those who registered or not, paid or not, the total number of graduation participants. Not only that, but also can send emails privately or blast.
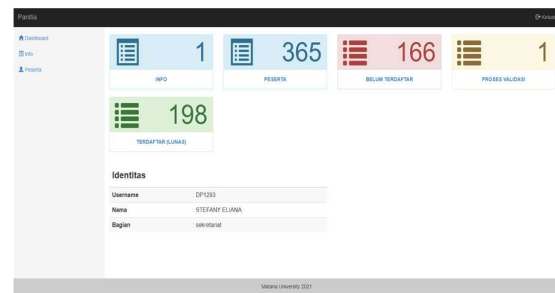

Figure 6. Page for secretariat section

The finance section has dashboard, profile, info and participant features, Figure 7. Apart from being able to monitor graduation participants. The finance section can change the student registration status to "Registered (Paid)" if the payment has been made.
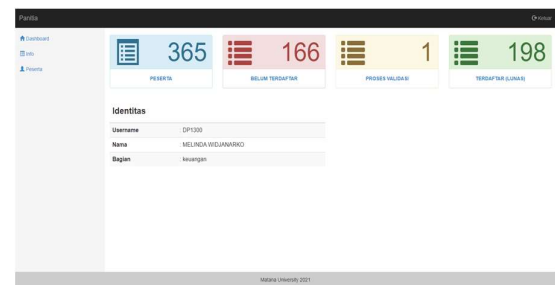

Figure 7. Page for finance section

CMS is managed by Admin. Some CMS features such as CMS configuration, gallery, news, announcements, adding users, backup and restore data.

Filling in the guest book which was usually done at the last graduation, is now being changed by presence via a QR Code. Before, The QR Code is distributed to each participant along with the distribution of invitations by email. On graduation day, the graduation participants showed their respective QR Codes to be read by the QR Code Reader owned by the committee, Figure 8.

Figure 8. Presensi peserta wisuda

MUGIS was used from the preparation for the graduation ceremony to graduation day. MUGIS has been proven to help to reduce committee workload, paper and printer ink efficiency, data transparency, support health protocols during the Corona pandemic (social distancing), easy to capture and distribution of data or information, monitoring of graduation participants (during registration and attendance) easily, can be accessed anytime and anywhere. This MUGIS played a very important role in the

success of the third graduation ceremony at Matana University.

IV. CONCLUSION

The Patas (Cepat Terbatas) software development model was built successfully. The implementation of the Patas model resulted in the Matana University Graduation Information System (MUGIS). The Patas model can be an alternative model for software development. To use the Patas model, an expert is needed, so that the selection of assistive devices and modifications runs smoothly. In the future, the Patas model needs to be tried for the development of different information systems or software.

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