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Application of Dynamic Systems Development Method in WEB-Based Promotion Media

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Abstract

Various kinds of promotional media such as billboard rental, newspapers and television. The promotion has a good impact, but it is quite expensive. In this developing era, it is online media that is most in demand by many people because of its practical nature. Web-based promotional media is a web which specifically becomes a place to promote information such as coupons and discounts that exist and gather people who want to promote in a practical way, so as to save money and also time in the process of making promotions. Dynamic System Development Method (DSDM) is a system framework that provides a lot of knowledge about project management. The DSDM method framework has five stages in designing and building the system, namely the feasibility stage, business studies, functional model iteration, design and build iteration, and implementation phase. The use of DSDM in system development can save time because the system design process is structured and neat, and also after the system is successfully built, the system maintenance process using the DSDM method can be done quickly and efficiently. The system to be built also uses a Codeigniter software framework. The Codeigniter framework is a PHP framework that can save time for programmers in designing a system.

Keywords: Promotion Media; Dynamic System Development Method; Framework; Codeigniter

1.0 INTRODUCTION

Basically, promotional media has been known for a long time, but the only difference lies in the medium. In the past, people did promotions manually, for example by word of mouth or with promotional media by going around using loudspeakers. Even though it doesn't cost money, this method is somewhat less effective in terms of both time and energy. However, today there are many companies that rely on technology media to increase their sales figures (Setiawan and Roestam 2017). This promotion can be done through television, which is a fairly good medium, but requires companies to pay a large amount of money. Manufacturers or distributors expect an increase in sales figures as technology develops (Hasugian 2018) .

At this time, Pelita Indonesia is conducting promotional media using media such as billboards, visiting schools, and also using promotional media in the form of discount vouchers printed by Pelita Indonesia and given by Pelita Indonesia's marketing team to prospective Pelita Indonesia students. Later, the vouchers will be submitted by prospective students who wish to register as Indonesian Pelita students at the front office (FO) along with the completed registration form.

The web page is like a book that can accommodate various information about many things, both commercial and non-commercial. Through this web media someone can provide certain information to other people around the world. The website became known in Indonesia around 1998, where only large companies were able to own it. At that time, the website was a technology that was quite expensive to own. So that many entrepreneurs and producers discouraged their intention to have this promotional media, but until 2017 there were more than 1.7 billion websites worldwide, with a total of 170 million active websites. Most of these websites are commercial websites of a business and commercial nature. It seems that promotional media in the form of websites plays an important role in the business world.

Dynamic System Development Method (DSDM) is a framework that has 5 stages in designing and building a system, namely the feasibility stage, business studies, functional model iteration, design and build iteration, and

implementation phase, by implementing this DSDM. can assist in designing and building software quickly and structured and maintaining the system through the use of incremental prototypes in a conditioned environment. This DSDM method will be applied to the construction of this Promotion Media Website to produce a good and structured design and development, so that Indonesian lamps can carry out promotional media easily, and for prospective students, namely getting information more quickly.

2.0 LITERATURE REVIEW

Agile Development Method

Agile Development Methods are a group of software development methodologies based on the same principles or short-term development of systems that require rapid adaptation of the developer to changes of any kind (Muharom Zaef et al. 2018). Agile development methods are one of the software development methodologies used in software development. Agile has the meaning of being fast, light, free to move, and alert. So that when creating software using agile development methods, it requires innovation and good responsibility between the development team and the client so that the quality of the software produced is good and the agility of the team is balanced (Listiyoko, Fahrudin, and Maksum 2017).

Agile development methods are defined in four values, commonly called the Agile Alliance's Manifesto, including: (1) Interaction and personnel are more important than processes and tools. In agile interaction between team   members is very important, because without good interaction the software development process will not go according to the plan. (2) Functional software is more important than complete documentation. When doing a demonstration process to clients, the software that works well will be more useful than complete documentation. (3) Collaboration with clients is more important than contract negotiations, one of the characteristics of agile is that the client becomes part of the software development team. Good collaboration with clients during the software creation process is very important when using agile. Because the functions of the software being developed must be continuously discussed and improved according to the client's wishes. (4) The response to change is more important than following the plan, agile development methods focus on the speed at which the team responds when the client wants a change during the software creation process.

Agile has several types of models, including: (1) Acceptance Test Driven Development (ATDD). (2) Agile Modeling. (3) Adaptive Software Development (ASD). (4) Agile Unified Process (AUP). (5) Continuous integration (CI). (6) Crystal Clear. (7) Crystal Methods. (8) Dynamic Systems Development Method (DSDM). (9) And others.

Dynamic Systems Development Method (DSDM)

Dynamic Systems Development Method (DSDM) is one of the Agile models that uses a framework to build and maintain a system in a limited time through incremental prototypes in a conditioned environment (Rusdiana 2018).

DSDM is developed in 5 phases, including (Sugianto and Tjandra 2016):

1. Feasibility Study

   The suitability of the initial project is assessed in this phase. This phase helps to identify answers to questions such as(Sani and Firdaus 2013) :

   a. The scope of the feasibility study is to gather the necessary details about whether there is Is DSDM applicable to this project?
   b. What are the dependencies that appear in this project?
   c. Are there any technical challenges?
   d. Are there limited resources?
   e. Are there any organizational issues that impact the project?
   f. Are there any risks that arise. If so, what are the risks?
   g. What are high-level estimates of the timescales and costs?

   A viable solution or not. Detailed analysis is carried out at a later stage. A Feasibility report is a high-level report that allows the project steering committee to decide on the future of the project, and further feasibility studies.

2. Business Study

   After conducting a feasibility analysis in step 1, the next step is to analyze the characteristics of business and technology. Business Studies provides the basis for all subsequent works. This phase leads to the affected business processes in detail and the information they need.

   This phase tries to answer some key questions, such as:

   a. What is the Project Scope?
   b. Are there any risks that need to be reviewed?

    c.   What are the non-functional requirements (performance, constraints, subjective)?

    d.   What is the prototype of the product in the future?

    e.   What is the basis for technological development?

    f.   What are the priority requirements identified in step 1 and step 2?

    This phase produces several definitions, among others; business area definition, priority needs, system architecture definition and development plan.

3. Functional Iteration Model

    This phase aims to provide a functional model consisting of both a working software prototype and a static model. This phase results in the processing of information obtained in business research. This phase can produce functional, non-functional models, time box plans, and functional model review records.

4. Design and Build Iteration

    This phase completes the functional prototype developed in step 3 to meet functional requirements. In this phase the system primarily develops to meet user needs. A trial product is the main result of this phase. This design and build iteration consists of four activities.

    a.   Identify module requirements.

    b.   Plan and plan as needed.

    c.   Develop modules, and

    d.   Validation of module functions.

    The Design and Iteration Build is accomplished in a time box plan, the system being tested, the design prototype, and test records.

5. Implementation Phase

    This phase includes the transition from a development environment to an operational environment. The main purpose of this stage is to place the tested system into the user environment and train individuals to use it.

Framework

Understanding a framework in the context of programming is a framework that helps developers in the process of making the system faster (Khoirunisa 2018). If the analogy of a framework is like a blueprint for a building when you want to build a house. The blueprint was created to make building work easier and more detailed (Arianto, Mukhammad Agus; Munir, Sirojul; Khotimah 2016). But developers don't have to build from scratch because there are libraries provided by the framework in question. What is clear is that the developer has to adjust to the existing rules in the framework.

CodeIgniter

Codeigniter was created by Rick Ellis in 2006. Codeigniter was created as a simple and elegant toolkit, enabling fast development of web sites or web applications and attracting the attention of thousands of talented PHP developers (Destiningrum and Adrian 2017).

3.0 METHODOLOGY

Research Framework

The research framework can be seen in Figure 1. The explanations for the framework are as follow:

1. Observation

    Observations are made in the first 2 ways of observation by going directly to the field by looking at the current conditions. The second interviewed Pelita Indonesia's marketing division regarding this research. Then also study articles, books, magazines related to this research

2. Data Collection

    Data collection in the form of the number of students, marketing strategies, target students to be recruited, then the costs required for promotion, as well as data related to campus promotion data

3. System Analys

    This third method, classifies the problems that occur, based on the results of observations and data collection related to the promotion. So that with the accumulation of problems, researchers look for solutions to existing problems.

4. System Development wihit DSDM Methods

    System development with the DSDM method, is a solution that researchers apply to existing problems. The DSDM method is applied to design the system, the system is directed at work and as a solution to the existing problems

5. Testing
   at the testing stage carried out is testing the system that has been built with the DSDM method to find out whether this system is feasible to implement or needs to be repaired again
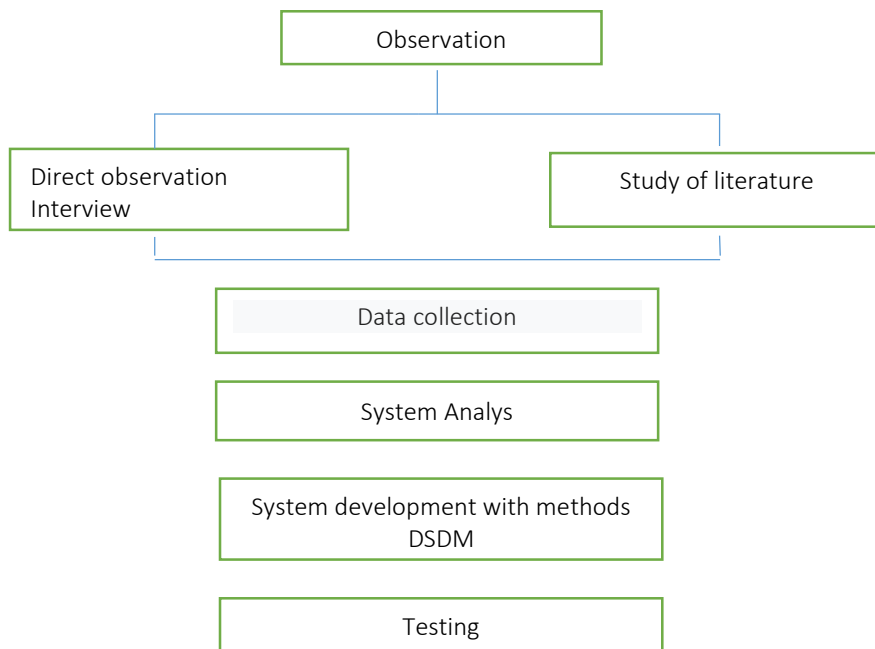

Figure 1. Research Framework

3.0 RESULTS AND DISCUSSION

Dynamic System Development Method (DSDM) is a framework that prioritizes continuous user involvement with an iterative and incremental development approach, which handles projects effectively and efficiently. DSDM facilitates a framework for developing functions in a better way, delivering functionality efficiently and effectively, and meeting the real needs of a project.

The application of the DSDM method must be carried out gradually, from one phase to another, if something happens, it can return to the previous phase.

The DSDM phases in this research are:

1. Feasibilty Study
   This stage will discuss the impact that might occur if the old system is still used, and decide what steps to take in the future of the project. At this stage we will discuss System Characteristics, old Information System Flow, old Use Case Diagrams, SWOT analysis and Object Diagrams. The use case diagram is seen in Figure 2.
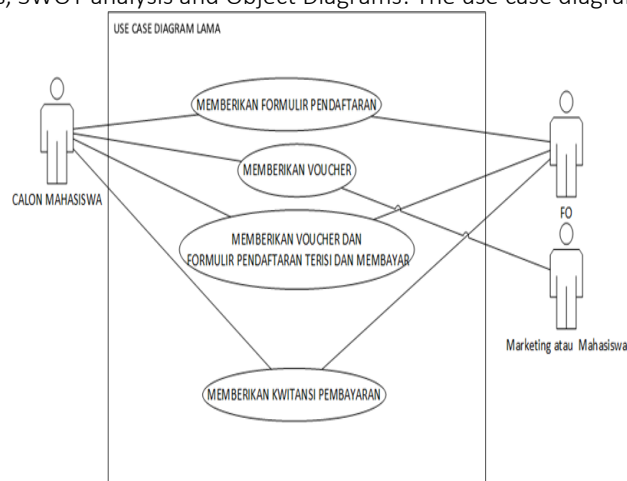

Figure 2. Use case Diagram

2. Business Study

Along with the development of technology, a good system must also follow the development of this technology, based on several factors that influence it. This phase will discuss the business and technology analysis of a system such as the business scope, the risks that are considered, non-functional requirements, future prototypes and also the basis for technology development.

3. Functional Iteration Model

This phase aims to provide a functional model consisting of both a working software prototype and a static model. This phase results in the processing of information obtained in business research. This phase can produce functional, non-functional models, time box plans, and functional model review records.

Figure 3. Time Box Plan

Figure 3 shows a time box plan that can help the process of making the system more structured, the time box plan is updated, each module has been designed and built which is in the fourth stage.
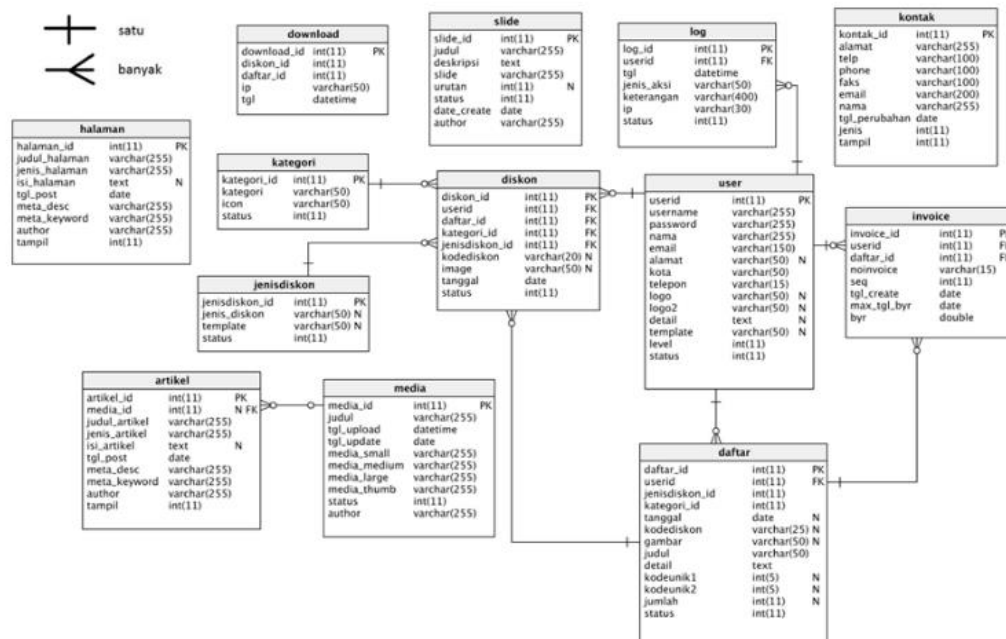

Figure 4. Class Diagram

Figure 4 shows a translation between databases that have been designed based on business research carried out in the second phase which will later be used to design and build the system at a later stage.

Table 1. List File Table

Field	Tipe	Panjang	keterangan
daftar_id	int(11)	11	Id Daftar
userid	int	11	Id User
jenisdiskon_id	int	11	Id Jenis diskon
kategori_id	int	11	Id Kategori
tanggal	date		Tanggal
kodediskon	varchar	25	Kode Diskon
gambar	varchar	50	Gambar
judul	varchar(50)	50	Judul
detail	text		Informasi Diskon
kodeunik1	int(5)	5	Kode Unik 1
kodeunik2	int(5)	5	Kode Unik 2
jumlah	int(11)	11	Jumlah
status	int(11)	11	Status

Table 2. User List Reference Table

user	0..*	daftar
userid	<->	userid

The userid of the entity list takes a reference from the userid of the user entity as shown in Table 1 and Table 2.

4. Design and Build Iteration

This phase completes the functional prototype that has been designed in phase three, by making a system design design according to user needs and developing it.

Figure 5. Add Coupon Form

Figure 5 shows the design of the form for making vouchers. After designing the form, proceed to create a system based on that design
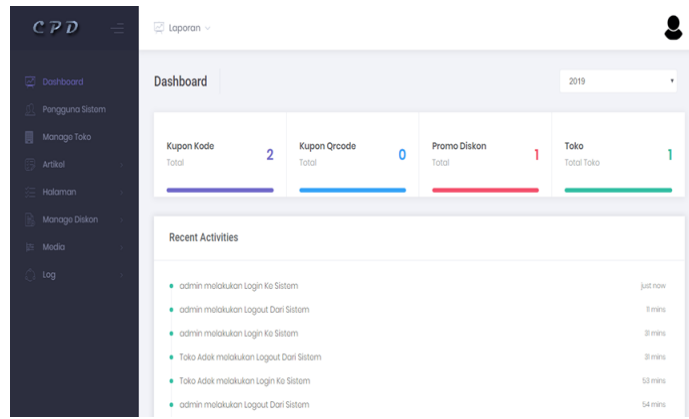
Figure 6. Web Preview

Figure 6 shows the initial view after login which is the initial display for going to other menus.

NO	Menu/Fitur	User	Final Status(%)	1	2	3	4	5	6	7	8	9
				20-10-18	03-11-18	03-11-18	24-11-18	01-12-18	22-12-18	05-01-19	19-01-19	02-02-19
1	Ganti Password	Admin, Toko	100%	100%								
2	Login	Admin, Toko	100%	100%								
3	Dashboard	Admin	100%								100%	
4	Pengguna Sistem	Admin	100%	100%								
5	Manage Toko	Admin	100%			50%	50%					
6	Jenis Diskon	Admin	100%		100%							
7	Kupon Code	Admin	100%			30%	30%	30%	10%			
8	Kupon Qrcode	Admin	100%					50%	20%	30%		
9	Promosi Diskon	Admin	100%			30%	30%	30%	10%			
10	Kategori	Admin	100%		100%							
11	Halaman => Profil	Admin	100%	100%								
12	Halaman => Halaman Tambahan	Admin	100%	100%								
13	Artikel => Berita	Admin	100%			100%						
14	Kontak Perusahaan	Admin	100%			100%						
15	Log	Admin	100%	100%								
16	Media / Gambar	Admin	100%	100%								
17	Slide	Admin	100%	100%								
18	Laporan Aktivitas	Admin	100%									100%
19	Laporan Invoice	Admin	100%									100%
20	Lupa Password	Admin, Toko	100%		100%							
21	logout	All User	100%	100%								
22	Daftar	User (Toko)	100%		100%							
23	Create Toko	User (Toko)	100%							100%		
24	Create Kupon	User (Toko)	100%							100%		
25	[Front] Beranda	All User	100%							80%	20%	
26	[Front] Toko / Perusahaan	All User	100%							80%	20%	
27	[Front] Kategori Kupon	All User	100%							100%		
28	[Front] Detail Kupon (Modal)	All User	100%									100%
29	[Front] Artikel => Berita	All User	100%									100%
30	[Front] Kontak Kami	All User	100%									100%
31	[Front] Register Toko	All User	100%									100%

Figure 7. Time Box Plan Filled

From Figure 7, we can see that each module that has been completed, the time box plan can be filled in until all modules are completed.

Figure 8. Display Add Discount List Form

Figure 8 is a display of the discount list add form which is used to register a discount.

Figure 9. Display Category Menu on Web Pages

Figure 9 is a display of the category menu on the front page of the CPD website, to be able to see the details of each voucher, just select the voucher you want.

Figure 10. Discount Voucher Details

Figure 10 is an example of voucher details, which contains detailed information about existing vouchers
5. Implementation Phase
    After the program has been completed, an implementation plan is required. At this stage of implementation, new system users are trained to users, required resources and increased user proficiency in using computers as well as seeing whether there are bugs or errors so that they can be handled as the system runs.

4.0 CONCLUSION

Based on the research and discussion that has been done, the following conclusions are obtained: (1) Dynamic System Development Method (DSDM) is able to define the requirements needed in building a web based promotional media system. (2) Development of a system using DSDM produces a system in accordance with the design that is done in a short time. (3) The workflow for making this system is clear and structured and fast in the process of repairing the system if there is a problem.

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