APPLICATION DESIGN OF THE NATIONAL BOOK READER USING ZAHMAN FRAMEWORK METHOD

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Abstract — This study aims to design, build, and implement an application that can increase the knowledge and interest of members to read books in one of community in Jakarta. Therefore made Gebuknas application where there are forums, news portals, library places, and chat. With this stage of analysis and design of Gebuknas application using Zachman framework methods and development method using a waterfall model.

Keywords — applications; framework; Zachman; gebuknas; community;

I. INTRODUCTION

Of the survey result 40 respondents said they prefer watching tv or movies a percentage of 30%, playing games, percentage of 25%, sport and playing handphone percentage of 15%, and likes reading books just getting 12,5%. In a few hours a day to read a book of respondents about 0 – 30 minutes with a percentage of 45 %, 31 – 60 minute percentage of 35%, 61 – 120 minutes with a percentage 12,5%, 121 – 180 minutes with a percentage 5%, and lastly read the book about 181 – 300 minutes get 2,5%. Program for International Student Assessment (PISA) said the level of Indonesian literacy in 2015 is still at number 64 from 72 countries. The latest data from the most Littered Nation In The World which is conducted by Central Connecticut State University in march 2016, shows that Indonesia is at number 60 from 61 member countries. Statistics UNESCO 2012 showed read interest index in indonesia new 0,001. Meaning that every 1000 people, only one child who has an interest in reading.

According to the UNESCO education development index, Indonesia is at number 69 out of 127 countries. Low interest in reading is still a problem that has not been resolved at this time. Various programs have been done to get solution in reading interest like bazaar, library run and other. This causes reading interest not always at the highest level. The reading has become the most important place in education as a means of communication in a highly educated society. Therefore, reading habits should be owned by learners starting from the basic level. Reading can connect people far from distance or time by sharing or providing information. It is important for students in general to tackle new knowledge in the technological era. The limitations of reading become lifelong learning and independent education. In other words, reading is a very valuable issue that is not just about fun but also a must.
Therefore, having readability is highly valued and important for social, economic, and educational progress. In conclusion, reading is the most important component in the academic setting [1]. Reading as an important form of entertainment and life skills does not just happen. This is a skill that must be formed from the early years of a child. Like other customs, reading habits are founded on the individual for a certain time. Habit is a learning product, while reading is the art of interpreting written discourse. So, reading becomes an experience cultivated and processed. Reading, as a long-term habit, is the main gateway to room knowledge. In this sense, reading habits are important tools for the development of the personality and individual mental capacities[2]. The role of government in the literacy movement in Indonesia is to form the School Literacy Movement (GLS) team that has a role to optimize the literacy movement in schools and in Indonesian society[3]. Language is a medium of communication among people around the world. Having a good mastery of language, people can communicate effectively to share various meanings, ideas, emotions, feelings and solve problems in life. It is inconceivable how people can express their complex and diverse ideas, meanings, feelings, and emotions without language. To increase the intensity and quality of relationships, communication, interaction, business transactions, trade and diplomacy with the world countries[4]. With the development of the field of information and communication technology is expected to help users in finding the location of the library when they are having problems in finding the place of the book. To find the library requires Global Positioning System (GPS) technology and Google Map API as a virtual map provider that runs in the app and displays the route on the user’s position to the library location. Technology using Location Based Services (LBS). By getting more accurate information, users can easily determine the shortest path to the library location[5]. For extensive reading to succeed, there are many factors to consider. This study looks at the benefits of reading the journal in extensive reading. Based on the findings, it can be concluded that reading a journal motivates students to read more, enabling them to understand key ideas and important details of their reading material of choice, and allow them to think critically[6]. Building web-based instruction becomes very important in enlarging learning to read experiences through online discussion, self-reading, and self-assessment activities. So, portable, laptop or android gadgets become indispensable that they can use to read exposure anytime and anywhere[7]. From the above, it is necessary an application that provides information about reading books in one of the book community in jakarta. This app is designed to communicate and interact with other members and provide knowledge to members to increase reading interest.

II. METHOD

A. Zachman Framework

Use Zachman’s theory for Gebuknas app, which is complicated below:

![Fig. 1 Zachman Framework](image)

The Zachman Framework is one of the frameworks of enterprise architecture that presents the perspective as well as providing a formal definition of enterprise and structured from various perspectives or point of view. There are six components on the zachman framework is What, Where, When, Why, Who, and How, the following explanation[8],[9]:

1) **What (data):** This column is used to connect between entities by translating data relationships with each other to illustrate the needs of the company to be maintained.

2) **How (function):** this column focuses on the process and the resulting function by describing the whole process that takes place within the organization, the process of activities in meeting the needs of stakeholders, and the processes of input and output that occur within the organization.

3) **Where (network):** this column focuses on the various nodes and links that describe the operational location of organization, the building structure to the network installation map owned by the organization.

4) **Who (people):** according to the structure and responsibilities that exist within the organization. This column focuses on roles and responsibilities in describing human or human resource allocations.
5) When (time): focuses on useful time cycles to describe the processing time in organizations that have relationships in building performance criteria and qualitative levels of organizational resources.

6) Why (motivation): focuses on the organization’s vision, mission and goals that describe the organization’s motivation and objectives as well as the strategies and methods of achievement used by the organization.

Each component is described and viewed based on 6 different perspectives: perspective planner, owner, designer, builder, subcontractor, and functional. Each row provides the following perspectives[10],[11]:

1) Planner Perspective: explains the direction and business objectives of a company.

2) Owner's Perspective: provides an overview of the actual business situation that includes the structure, function, and organization of the enterprise that exists within the business context.

3) Designer Perspective: Designers, designers or architects who contribute to the owner's desires descriptions at the technical level, describe the application system from a needs perspective, and explain in detail the changes in the form of data that occur in every business function.

4) Perspective Builder: explains how technology can be used to meet information processing needs as well as to solve business enterprise problems.

5) Subcontractor Perspective: As a responsible part in building and assembling parts or components to become end products or services.

6) Functional Perspective: The end system or product implemented by an organization consisting of programs and databases. This perspective contains the final product that is implemented.

In the application of the Zachman Framework method how to design there are 6 columns from the perspective that must be explained to support the process in the application and generate the application design that can provide solutions to problems in the application process in the form of a Zachman matrix[12].

B. Waterfall

The Waterfall model is the most widely used models in Software Engineering (SE). The model is a systematic and sequential approach starting from the system requirement level and then to the planning, modeling, construction and delivery phases of the software system to the user, ending with always support on the resulting software.

![Waterfall Pressman Development Model](image)

In Figure 2 an explanation of the steps taken in the Waterfall Model[13]:

1) Communication: The initial stage requires communication with the user to achieve the goal to be achieved. The result of such communication is the initialization of the project, such as analyzing problems encountered and gathering the necessary data, and help determine the features and functions of the software. Additional data collection can be taken from journals, articles, and the internet.

2) Planning: After the communication, then set the plan describes the software workmanship that includes the technical tasks to be done, the risks that can occur, the resources required in the system creation, product work to be generated, scheduling work to be done, and tracking system work processes.

3) Modeling: This modeling stage is a design stage in software that focuses on designing data structures, software architectures, interface views, and programming algorithms. The goal is to know what to do.

4) Construction: At this stage described the process of translation in the form of design into a code or language that can be read by the machine. After the encoding results are complete, testing is required from pre-made systems and codes. Aim to find any errors that may occur for later repair.

5) Deployment: Stages of deployment are the stages of software implementation to the user, regular software maintenance, software upgrades, software evaluation, and software development based on the feedback provided so that the system can continue to run and evolve according to its function.

III. RESULT AND DISCUSSION

The survey results of 40 respondents, there are 97.5% of respondents admitted interest in reading applications like reading books nationwide.
Fig. 3 Interest Chart using Gebuknas application
The next research results calculate how much time using the Gebuknas application in a day. There were 37.5% of respondents choosing 0 - 30 minutes, 42.9% choosing 31-60 minutes, 15% choosing 61 - 120 minutes, 2.5% choosing 121- 180 minutes and 181 - 300 minutes.

Fig. 4 Time chart using Gebuknas Application

A. Zachman Design
In this section will explain the results of research in the form of a matrix to design gebuknas applications viewed from the perspective of the owner and a planner can be seen the results below:

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Owner – HR Manager (Business Model)</th>
<th>Planner – IT Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Data (What)</td>
<td>Gebuknas Application Process</td>
<td>Server, Database, and Resources</td>
</tr>
<tr>
<td>Motivation (Why)</td>
<td>Purpose of Gebuknas Application</td>
<td>Purpose of Enterprise application development needs</td>
</tr>
<tr>
<td>Function Process (How)</td>
<td>Use Case Diagram</td>
<td>Activity Diagram</td>
</tr>
<tr>
<td>People in Charge(Who)</td>
<td>Member</td>
<td>Web Administrator</td>
</tr>
<tr>
<td>Location (Where)</td>
<td>Hosting Provider <a href="http://www.rumahweb.com">www.rumahweb.com</a></td>
<td>Community Hosting Package</td>
</tr>
<tr>
<td>Time (When)</td>
<td>Project Duration</td>
<td>Time Schedule</td>
</tr>
</tbody>
</table>

a. Asset Data (What)
1) Owner Perspective
According to the owner, the gebuknas application process is described in the process below:

2) Planner Perspective
On the planner side there are 3 perspective plans: 500MB Space, Unlimited Traffic Limit, Unlimited Email Account, 2 Additional Domains, UNLIMITED MySQL / MariaDB, Server Location: IIX / US / SG, Weebly web builder for FREE.

b. Motivation (Why)
1) Owner Perspective
In this section the motivation of the owner wants the addition of gebuknas application which aims to facilitate the process of information and proper book discussion.
2) Planner Perspective
In accordance with the owner’s perspective, as a motivational planner is an application that is created to improve the application of business processes both to the community and nationally.

c. Function Process (How)
1) Owner Perspective

Fig. 6 Use Case Diagram
Fig 6. shows the use cases between members and in-app admins, there are in-app and admin modules as an in-app communication process.

2) Planner Perspective

Fig. 7 Activity Diagram Creating a Forum
Fig 7. shows responding to the forum, members can fill out forum comments that can be seen by other members. Members want to see news about book information. Therefore the admin shows below:

Fig. 8 Activity Diagram Manage News and View the News
Fig 8. shows the creation of news by admin of the system, from creating a news side admin can create, delete, and edit news. Shown to the news portal They can see news in the application area in the news module. Members want to see bookmark information in Indonesia. Therefore it will be explained below:
Fig 9. shows the search for the place book information, the member can choose the information where the book is in the application then will be transferred to the maps. The Member wants to communicate to fellow member about book information, show on below:

Fig 10. shows the creation of other members’ messages to the system, starting from creating side-by-side messages to signing in or registering their accounts to continue the process of sending messages. They can see chat messages in the app area with other members.

d. Function Process (Who)
1) Owner Perspective
   In this section anyone assigned to operate this application is a member.
2) Planner Perspective
   In this section, anyone assigned as an operator for an app is a Web administrator. Operators will help solve system problems and prevent from system malfunctions.

e. Location (Where)
1) Owner Perspective
   In this section for answers Owners already have information about systems that can access community email access.
2) Planner Perspective
   Planners plan to select the hosting package www.rumahweb.com because in accordance with the planned specifications, easy to build website.

f. Time (When)
1) Owner Perspective
   This section describes the owner's perspective in its implementation, which is expected to be conducted over 3 months from February to April 2018
2) Planner Perspective
   This section describes the time schedule proposed in the design of the gebuknas application:

Table 2 discusses the project time for 3 months from February to April 2018, in February from the first week to the second week for the collection of information about user needs, after which the communication process then sets out a plan for software development that includes technical tasks to be performed during the week until the first two months of March.
, the modeling process is the requirements requirement for software design in the second and third weeks of March, the construction phase is the coding process in working on this application within 3 weeks to March in the second week of April, and for final requirements, regular application maintenance during the second week to the fourth week of April.

B. Development Results
This section describes the results of the development of gebuknas applications:

Fig 11. Main Page
Fig. 11 members can choose the main menu which consists of: library portal running and information about gebuknas, on the main page there is also a forum menu, news, library, chat, contact, and login.

Fig 12. Login Page
Fig. 12 shows the member can enter into the application with the condition that the user has a registered account if the user does not have a registered user account select the list to register.

Fig 13. Page Category Forum
Figure 13 on the forum page there are categories that can be selected by the user to start the discussion, in this application there are 8 categories namely, religion, children, language and dictionary, novel books, science, comics, magazines and technology.

![Fig 14. Forum Page](image)

Fig 14. on the members forum page can see topics created by other members of the gebuknas application.

![Fig 15. Forum Thread Pages](image)

Fig 15. Displays a page for forums used to create new topics in forums on gebuknas applications.

![Fig 16. Reply to Comment](image)

Fig 16. shows comments made by members of the forum topics discussed in the gebuknas application.

![Fig 17. Comment Page Forum](image)

Fig 17. shows members can view comments from topics created by other members.

![Fig 18. News & Event Pages](image)

Fig 18. News & Event Pages
Fig 18. on the news & event page is a book information created by the admin, then can be seen by the members to find information about news and events about the book.

Fig 19. Library Page
Fig 19. on the library page is where libraries exist throughout Indonesia, by selecting the desired library to search for information where the library is located.

Fig 20. Chat Page
Fig 20. on the chat member page can send messages to other users in the book information discussion.

Fig 21. Admin Page
Fig. 21 on the admin page there is the main menu consists of homepage, user list, topic, comments, news, news category

Fig 22. User Data In Admin
Fig 22. shows that admin can manage member data registering in gebuknas application.
Fig 23. News category in admin
In Fig 23. explains admins can create news categories as needed.

Fig 24. Admin News
Fig 24. shows that admins can add news based on created categories, then can be viewed by members in gebuknas app.

Fig 25. Topic Data Page
Fig 25. shows the admin can manage the data that is on the topic of the forum from that made by members in the application gebuknas.

Fig 26. Comment Data Page
Fig 26. shows the admin can manage comment data from forum comments from member comments in gebuknas application.

Fig 27. Admin Chats
Fig 27. explains the admin can to chat with other members who want to be asked about the book.

IV. CONCLUSIONS
From the analysis results concluded that interest in reading requires an application to support information about the interest of reading books. In the interest of reading to the application of gebuknas with a percentage of 97.5% of 40 respondents, from the percentage that the belief of this application can Gebuknas interest in reading books about how many hours using this application Gebuknas. By using the framework method zachman can generate application design that can provide solutions to problems in the process of Gebuknas application system in an effort to increase the love of the world of reading.

V. REFERENCES
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