Application Design Library With Gamification Concept

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Abstract: The library is an effort to maintain and improve the efficiency and effectiveness of the learning process. Various means have been used to enhance the library's role in community development. One way is to develop a concept and a different orientation in the management system or the library. The concept in question is gamification. Gamification is a process with the aim of changing jobs or activities that usually go tedious and less enjoyable to be more interesting and fun to do. One approach taken is to reward both virtual and non-virtual that can increase people's motivation to do something, in this case, is to visit and take advantage of the functions and library facilities. This research resulted in a model that features a library application with the concept of gamification. The model can be implemented into an application that will increase visits and activities at the library. Thus the function and the main purpose of the library be met.

Keyword: Library, Gamification, Application

Introduction

Library as a center of knowledge and learning have such an important role in community development. At the library contains a lot of information that can be used by communities to improve the competence or expertise. In addition, the library also holds so much information and knowledge that can be used to solve the problems of everyday life. The library is an effort to maintain and improve the efficiency and effectiveness of the learning process.

Various ways have been used to increase the role of the library for the advancement of learning and education process. Ranging from improved service and efficiency of human resources in this case is the librarian, the last collection as a primary source of information on a regular basis, provision of facilities such as facilities and infrastructure of the computer as one of the major steps of digitizing libraries, creation of digital books (e-books), as well as the development of information technology tools and other communications. Another way that can be used to increase the role of the library is to build and develop the concept and different orientations on the system or the management of the library, one of the concepts that can be used are gamification (gamification).

Gamification is a process with the goal of changing the non-game context becomes much more interesting by integrating a thinking game, game design, and game mechanics. The use of gamification is very effective to make the work or activities that usually go dull and less pleasant to be more interesting and fun to do. One approach taken is to reward both virtual and non-virtual that can increase people's motivation to do something, in this case is to visit and take advantage of the functions and library facilities. By getting an award or reward, a particular someone will be encouraged to increase visits to the library. Competition in occupying a position in a leader board also makes visitors library "challenged" to perform various activities that enable high point. With the increasing activity in a library, the role and function of the library become more leverage.

Research Methodology

Research Methods provides an explanation of the steps, data, location research, evaluation methods used and structured explanation of the algorithms or methods of research are discussed.

A. Stages of Research

In this research will be several stages of a cycle to produce a conclusion. The stages in this study are as follows:

1. Identification of Problems

   At this stage will be the identification of the problems that occur. The problems have been analyzed and then summarized into a formulation of the problem and molded into the boundary problem. The main issues raised was how to design a library application with the concept of gamification.

2. Search Library

   At this stage will be carried out from the literature related to the subject of research, by studying reference books and similar publications on the research and who have previously done.

3. Collection and Processing of Data

   At this stage of data collection will be done by using multiple techniques, data collection such as interviews, observation, and literature study. The data collected will be processed and analyzed to determine the results *(output)* in the form of appropriate models to be used at a later stage.

4. System Design

   This phase will be made draft *business model* and *information system models* the using *Unified Modeling Language* (UML). While the design *database* is described in the form of *Entity Relationship Diagram* (ERD).

5. Inference Results

   Conclusions obtained in this study is based on data collected and processed in the data collection and processing. Conclusions can be retested validity by examining the type and nature of the data and the resulting model.

From the above explanation, the following is a description of the stages used in the execution of this study:

Figure 1. Stages of Research

B. Time and Location Study

This study will run for four (4) months with a case study on library research Universitas Islam Darul Ulum Lamongan.

C. Data Collection and Analysis Techniques

Data collection techniques are the most important step in the research process. The data collection techniques used in this study are as follows:

1. Interview

    The interview process conducted by face to face and do a debriefing about the activities and business models that take place in the library, Universitas Islam Darul Ulum Lamongan. The results of these interviews are collected in the form of notes which are then processed into one source of information.

2. Observations

    In this study, the observation is made by observing the activity that happens on the object of research. The activity of which is the process of recording the visit, borrowing and repayment collection by members of the library, the process of data collection and circulation of collections by librarians, as well as the utilization of library collections in Universitas Islam Darul Ulum Lamongan.

3. Literature

    Literature study data collection techniques by conducting a search for books, articles, notes, and reports related to the object of research.

    To generate a good system design, the analysis, and classification of all data, processes, and users involved in the system.

1. Data Analysis

    The data obtained are then processed based on the classification and function and are equipped with attributes that match the domain data is needed.

Table 1. Data Analysis

No	Name Data	Description
1	Book	List collection of books owned by the library
2	Title	List of titles owned by the library
3	Author	List the names of all the authors who have recorded
4	Publisher	List the names of all book publishers are

		being recorded
5	Loan	transactions list book lending library
6	Returns	List of transactions return library books
7	Librarians	list of librarians in the library
8	Members	List of members of the library
9	Challenges	list of challenges *gamification*
10	Rewards	List "gift" for members who complete an activity *gamifiation*
11	Badges	List of badges that can be gathered members of the library
12	Administrator	List user with administrator access

2. Process Analysis

      Process Analysis needs analysis process obtained based on interviews conducted in the librarian. It also made the observation to observe library routines.

Table 2. Analysis of Process

No	Process Name	Description
1	Process the Data Book	covers the process appear, save, and modify the data Book
2	Process the Data Titles	Covering process appear, save, and modify the data Titles
3	Processing Data Author	Covers the process appear, save, and change Data Author
4	Processing Data Publishers	Covers the process appear, save, and modify the data Publisher
5	Cultivating Transaction Loan	Covering the process performed and store transaction data Loan
6	Processing of Transactions Refund	Includes processes performed and store transaction data Returns

7	Processing Member Data	covers the process appear, save and change the Member data
8	Process Data Librarian	Covering process appear, save, and modify the data Librarian
9	Processing Data Challenge	Covering process appear, save, and modify the data Challenge
10	Processing Data Reward	Covers the process appear, save, and modify the data Reward
11	Processing Data Badges	Covers performing process, store, and change the data badge
12	Administrator Data Processing	Covers produce appear, save, and change the Data Administrator

3. User Analysis

Classification of users become an important part of a design and development of the system. Classification is done by observing the activities and interviews on the librarian.

Table 3. User Analysis

No	Classification User	Description
1	Administrator	It is typical that users can manage key data used in the system.
2	Librarian	Merupakan tipikal pengguna yang mengelola peminjaman, returns and other transaction management.
3	Members	Represents members of the library to borrow books at the library.

D. Business Model Design

Designing a business model is made to describe the flow of the system and its interaction with the user. The design that has been produced is summarized in the form of *Use Case Diagram, Class Diagram, Activity Diagram* and *Sequence Diagram.*

1. *Use Case Diagram*

In *a use case diagram* form 6 (six) *use case* that represents a business model as well as the conditions to be metasystem of *actor*s might. Actor formed three (3) Actor, the Administrator, Librarian, and members.
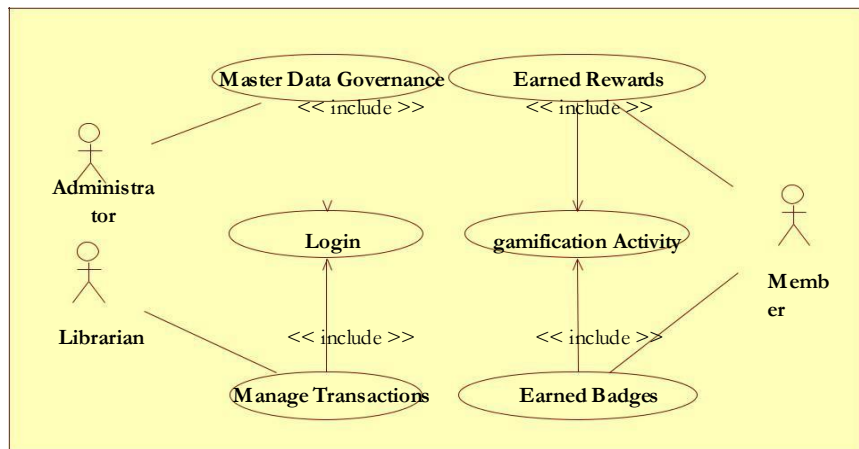

Figure 2. *Use Case Diagram*

2. *Class Diagram*

Class diagram describing the structure of the system in terms of defining classes that will be created to build the system. In the *class diagram* established 13 (thirteen) *class,* the *class* Login, Author, Title, Publisher, Librarian, Book, Borrower, the administrator, Challenges, Borrowing, Returning, Badges, and *class* Rewards

3. *Activity Diagram*

Activity diagram download showed various streams of activity in the system that is being designed, how each start, the *decision* that may occur and how they ended. Here is a picture of *the activity diagram* library application with the concept of gamification:
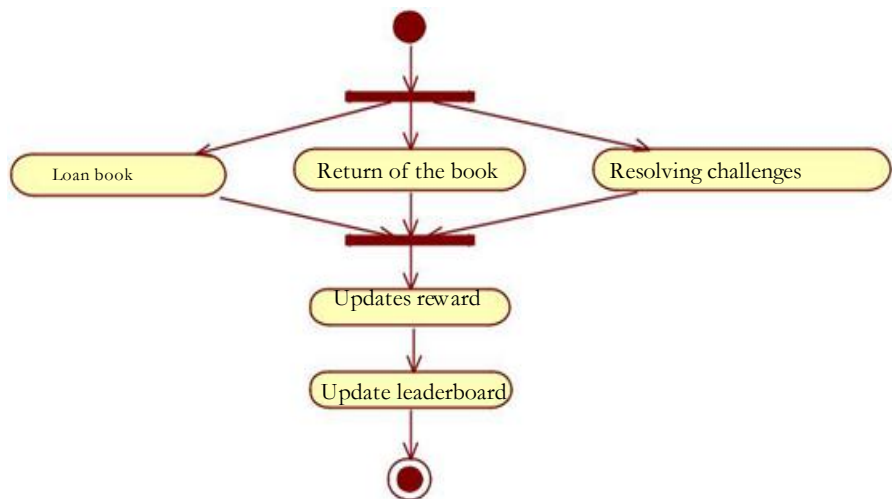
Figure 4. *Activity Diagram*

4. *Sequence Diagram*

    Sequence diagrams are used to describe a scenario or series of steps.

Conclusion

From the research carried out has resulted in a design library application with the concept of *gamification.* The design results in the form of restrictions and the scope of the system consisting of the needs assessment data and the needs assessment process. The design governance systems described in *use* case. Design logical models generate *class diagrams, activity diagrams,* and *sequence* diagrams. While on *the Entity Relationship Diagram* (ERD) is formed of 8 (eight) entities, ie entities Author, Title, Publisher, Books, Borrow, Librarian, Back, and Borrower entities. The model can be implemented into an application that will increase visits and activities at the library. Thus, the function and the main purpose of the library be met.

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