Information system design of data bank population using Rapid Application Development

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Abstract. Population data is available from the results of structured individual data and aggregate data as a result of population registration and civil registration activities. In Indonesia, many high school students who are seventeen years old do not yet have a national identity card; this is due to their lack of knowledge of how registration to get a national identity card. The purpose of making this article is to provide an opportunity for students to make it easier to get their residence documents, such as making a National Identity Card. The methodology used is Rapid Application Development, with the stages of business modeling, data modeling, process modeling, application formation, testing, and turnover, wherein this article is limited only to the scene of the modeling process. The results of this study are in the form of a population data model in Web-based for Senior High School or Equivalents, and to make it easier for students to receive information about their residence documents such as making national Identity Cards.

1. Introduction
Population data is any display of population data in both official and non-official forms issued by population registration bodies (governmental and non-governmental) in various forms, such as numbers, graphics, images, etc. [1]. Specifically, Law No.24 of 2013 article 1 point 9 states that population data is structured individual data and aggregated data as a result of population registration and civil registration activities [2]. The information system is a system that provides information for management in making a decision and also to carry out operations within the company, where the system is a combination of people, information technology, and organized procedures [3-7].

The duties of the Population and Civil Registry Service are to serve: 1. Population Documents: KTP (National Identity Card), KK (Family Card); 2. Civil Registration Documents: Birth Certificate, Marriage Certificate, Divorce Certificate (Non-Muslim), Death Certificate, Transfer Certificate. Factors that become the problem are Ignorance; the element of Honor, ownership of civil registration documents, is still low on average from the age of 0-18 years. From several factors, one of them is in making National ID cards that are still not effective because there are still many people who do not know how to get a National ID card. Thus, the Department of Population and civil registry felt overwhelmed [8].

There are some previous studies, such as the first study regarding the Design of Data Bank Software Management in Garut regarding waste data management [9]. The secondary research about the Design of Question Bank Application for Study Program of Informatics Engineering at Garut College of Technology is a Problem Bank application for storing questions about the results of the evaluation [10]. Third research regarding PopHR: a knowledge-based platform to support integration, analysis, and
visualization of population health data [11]. Fourth research concerning Design and methods of the Population Assessment of Tobacco and Health (PATH) Study [12]. Fifth research concerning Modules for Rapid Application Development of Web-Based Information Systems (RADWIS) [13]. Sixth research on Exploration of Rapid Application Development [14]. Seventh research concerning Geographical information system of fire incidents data monitoring [15]. Gap analysis from previous studies is the absence of population data bank applications for students 17 years and older to get a National ID card in Garut. The purpose of this study is to design the app of Population Data Bank in Schools to minimize the number of residents who still do not have National ID cards.

2. Methodology
The methodology used is Rapid Application Development (RAD) with stages consisting of Business Modeling, Data Modeling, Process Modeling, Application Formation and Testing, and Turnover [16]. Which in this study is limited to the Application Formation. The framework scheme described in the WBS (Work Breakdown Structure) [17], which lists each process that occurs in the system, wherein WBS designed to follow the stages of RAD. The following is a description of WBS based on the objectives and methods of system development:

![Work Breakdown Structure](image)

**Figure 1. Work breakdown structure.**

Based on Figure 1 Work Breakdown Structure, the explanation is as follows:

- Activities start from business modeling to identify problems based on background, know the business processes that are running, and to know every event that occurs in the system and break it down in Work Breakdown Structure
- Followed by the Data Modeling process after identifying the business process proposal and each activity to determine the relationship between these elements with the design of Entity-Relationship Diagrams to support the design of the system to be carried out.
- Based on data obtained in Process Modeling, context diagrams, and data flow diagrams then made to determine each process that occurs in each activity.
- Next, the Application Forming process is the application design stage.
3. Results

3.1. Business modeling

After gathering the information needed, the next step to do is to analyze the system. The stages of the system analysis carried out as in the flowchart below:

![Flowchart](student_admin_population.png)

**Figure 2.** Business process proposed.

In the business process, there are three entities involved, namely students, admins, and Population and civil registry service. The proposed business processes are as follows:

- Admin to collect or retrieve student data to government agencies and educational institutions.
- Existing student databases will notify officers when students have a birthday and are 17 years old to get a national identity card immediately.
- Check the validation of whether or not a national identity card is appropriate, and the officer will automatically make a national identity card for the student.

3.2. Data modeling

In this stage, the application planning carried out starting from the creation of related entities in the system, making the overall activities sorting every event that occurs on the system, to making the design of the interface that will be using in the network.
Figure 3. Entity relationship diagram.

From figure 3, can be obtained relations between entities. Such as from admin to student with relationships one too many, from admin to population and civil registry services with connections one to one.

3.3. Process modeling
In this stage, the context diagram made in figure 4:

Figure 4. Context diagram.

The context diagram does not describe data storage but only contains one process that is the whole system process, wherein the context diagram shows the main data flow to the system and the main data flow from the system. In this context diagram, there are two supporting entities, which is Population and civil registry service and Admin.

3.4. Application formation
Interface design where the first page found when the user will access the information system, here is an overview of the interface on Information System Design of Data Bank Population. The description is as follows:
In the interface, there is a login menu for the admin login and Population and civil registry service. Besides that, there is a student data feature where student data inputted on that feature. For reporting, there is a reminder menu where when a student has a birthday and is entitled to get a National ID Card, the student will automatically get his National ID Card without having to go through a long process.

4. Conclusion
Looking at the results and discussion, the conclusions that can draw from the application of student affairs are: This Population Data Bank Application can help Population and civil registry service to minimize: 1. Community ignorance; 2. The element of Honor; 3. Ownership of civil registration documents is still low on average from the age of 0-18 years in making National ID Card. In addition, Simplify Population and civil registry service in knowing student data that does not yet have a National Identity Card.

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