DEVELOPMENT OF ONE CARD PAYMENT AND ELECTRIC ATTENDANCE ID ON ONE INTREGATION SYSTEM USING RFID TECHNOLOGY IN SMKN 6 GARUT

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ABSTRACT

Sekolah Menengah Kejuruan (SMK) Negeri 6 Garut is one of vocational school are located in between Garut and Bandung, West Java. Known as good quality school with A rated accreditation, has good facility. Many students applied to this school years by years and better services are required. Three problems has been found, first is Administrator finding hard to write and check every student payment due to many students (about 919 students) must be served one a time; Second problem is long queue likely to happened every month , because there are only one both opened to pay monthly payment; Third problem is there are still some student who cheated on their absence.

A New system has been made to solve those three problems, with this system administrator can easier and faster to write and check all student payment, to make a less queue and to help teachers controlled and monitored every student attendant in class.

Based on beta test, this new system is succeed to handle and solved all encountered problem. It can reduce queue, make student payment process easier and faster and help teacher to minimalize cheating process on student attendant.

Key word : *RFID student attendant, RFID monthly student payment.*.

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1. INTRO

Education is one manifestation of human culture to grow and follow the dynamics of the changing times. This needs to be done in a continuous and systematic as to adjust to the needs and development of science and technology and to meet the challenges of the future. The speed of change and the advancement of science and technology (Science and Technology), which continues to be applied according to the development of the industry into the world of HR (Human Resources) are adaptive, resulting in the participation and guidance of the industry towards greater Vocational Secondary Education. A paradigm shift in society that education is to educate children according to age, according to the needs and meaningful. Seeing this reality, it is precisely in the Village Cijolang, District Limbangan, cross-provincial road Bandung - Tasikmalaya established a Vocational school named Vocational High School (SMK) Negeri 6 Garut. Increasing number of students who apply to this school, then the school does quality and quality should be improved. In the current system used by SMKN 6 Garut in the record and manage the students who do the manual way and there is no special application to record and manage all the data related to the payment of monthly school fees. Based on a brief interview with Endin Jumardin as employee administration, it can be concluded that the administrators have difficulty to log the students will perform a monthly fee because there is only one counter open and must serve all students who will make the payment.

Not only the administration, researchers also conducted a short interview the student representative named Santika Dewi. The results of the interviews showed that the students had to queue length each month when making monthly payments. Arman A. Rusmana, S. Pd as vice principal of student section added there are also students who commit fraud when the attendance. The attendance at this school is still done by hand. Loss of archives and destruction of records or documents absenteeism was unavoidable due to human error. Then the application of Radio Frequency Identification (RFID) in SMKN 6 Garut in as appropriate solutions for a variety of weaknesses in the financial management of monthly dues and attendance this process.

RFID stands for Radio Frequency Identification, RFID term used to describe the various technologies that use radio waves to automatically identify a person or an object [1]. RFID technology provides several significant advantages such as allowing users to perform self-service (self service) [2], the time efficiency [2] [3] [4] and minimize queue [2] [5].

1.1 Research Methodology

The methodology used in this research use descriptive research methodology. Descriptive method is a method in researching the status of a group of people, an object, a set of conditions, a system of thought, or a class of events in the present. The purpose of this descriptive study was to create a description, picture or painting in a systematic, factual and accurate about the facts - facts, nature - and the nature of the relationship between the phenomenon investigated [3].

1.1.1 Method of Collecting Data

Data collection methods used in this study are as follows:

1. Literature

The study of literature is an activity by doing a search and data collection libraries that support the research that will be done. The library of books, articles, journals, and a final report that has to do with the title of the study.

2. Interview

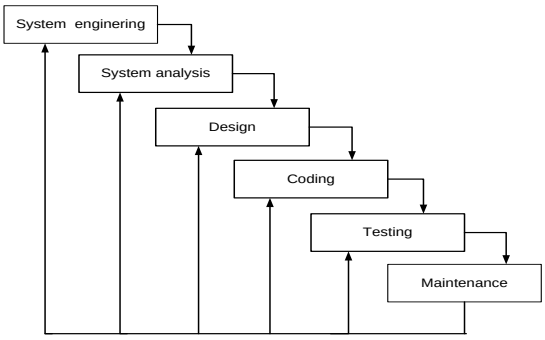
Data collection techniques held a question and answer directly to the authorities at SMK 6 Garut in connection with the issue that is being investigated as the administration, teachers and students.

3. Observation

Observation of directly observing work processes that are running SMKN 6 Garut to obtain a clear picture of the object on conscientious..

1.1.2 Software Development Methods

Methods of data analysis in software development using Waterfall software development paradigm, which includes several stages of the process is as follows:



Pictures 1 Waterfall Method [4]

Waterfall model is a model of software development is done sequentially, where the stage is done after the previous stage is completed. Steps - steps in the Waterfall Model are:

1. System Engineering

In this step is the determination of the various needs of all the things required of this new system and allocate to the formation of the software.

2. System Analysis

The next step researchers analyzed what things are needed in the implementation of software development. One of them does is interviewing relevant parties such as the administration, students and teachers to know what needs to be applied later in the software to be built.

3. Design

At this stage penliti carry out the translation of the data that has been analyzed into a form that is easily understood by the user. Which at this stage is to make face-to-face design of electronic attendance system and one card payment and determine the functions that will be applied later in the system.

4. Coding

The next thing to do is Coding process, which the researchers to translate data or solving a problem that has been designed keadalam programming language. Here in the stage of the lawyer-codingan using PHP / Hypertext Prepocessor.

5. Testing

After the coding process is completed, researchers will conduct test (alpha and beta) by trying this system in the field, and see if it meets the needs of the user and see if the system is better than the previous system.

6. Maintenance

Maintenance final stage where the maintenance was performed by the researchers and the school, if necessary, will be added new functions or made changes so that the system is running very maximum.

2.1 RFID (*Radio Frequency Identification*)

RFID (Radio Frequency Identification) is an identification method using a tool called RFID tags or transponders (tags) to store and retrieve data remotely. Label or RFID card is an object that can be installed or incorporated in a product, animal or even human beings for the purpose of identification using radio waves [6].

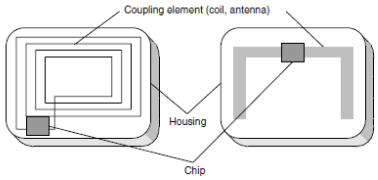
RFID is a technology that uses radio frequency media in the process of identification. Identification is done automatically on objects or humans without the need for manual operation. So we can conclude, RFID is a data capture technology that can be used electronically to identify, track and store information stored in RFID tags [7].

2.1.1 RFID Components

RFID consists of three main components, namely:
1. RFID tags contain antennas as a coupling element which allows it to receive and respond to any queries that are emitted by an RFID reader. There is also a chip capable of storing a number of unique information.
2. RFID Reader, contains a radio frequency module (transmitter and receiver), the controller and the coupling element to the tag.
3. Host computer, consisting of the top database that stores all the data contained in the tag. Computer systems that manage the flow of information from items that are detected within the scope of RFID systems and the communications between the tag and the reader..

2.1.2 RFID Tag

RFID tag is a small object, a component consisting of a chip and antenna. These tags may be adhesive sticker attached to an item or product. Moreover, these tags can also be in the form of coins and cards. The shape and structure of this tag is made flexible according to the object to be identified. The image shows the basic layout of an RFID tag:



Picture 2 Basic Layout RFID tag [14]

2.1.3 RFID *Reader*

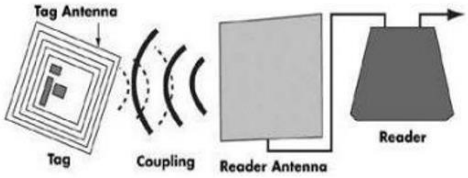
The working principle is similar to the RFID reader radio transceiver, which transmits and receives. Reader is in standby mode will emit electromagnetic waves in accordance with its range. When there is a tag enters jangkauannnya area, the tag will derive power from electromagnetic waves reader. Of power obtained, the tag transmits data were taken. The emission data will be accepted by the reader. Furthermore, the data received will be forwarded to the application to be processed in accordance with the system design.
In function, the RFID reader is required to perform two tasks, that communicate through radio waves and carried the tag read data is then forwarded to the application.



Picture 3 RFID *reader*

2.1.4 Configuraion

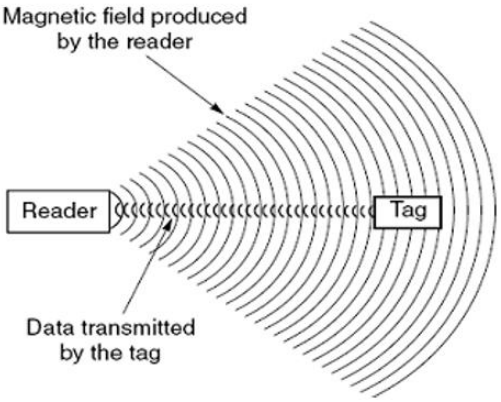
The general configuration of the RFID require a minimum of tags (which serves as a transponder), a reader (which serves as an interrogator), and an antenna (which serves as a coupling device). Reader is usually connected to a host computer or another device that has the intelligence to further process the tag data and decided to take an action. One important element in RFID is a data transfer. Data transfer occurs when the relationship between a tag and a reader, which is known as coupling, via antenna mounted either on the tag or reader as illustrated in the figure below:



Picture 4 The relationship between the tag, reader and antenna

2.1.5 Coupling Method

Coupling in many RFID systems using magnetic (inductive) or electromagnetic (backscatter). The method used depends on price, size, speed, and range as well as the accuracy of the readings. In general, the communication between a tag and a reader is done with a physical principle known as a backscatter modulation. In this process, a reader sends a signal to a tag, and the tag will respond by reflecting some of this energy back to the reader. This can be illustrated from the image below [8] :



Picture 5 Data transfer RFID tag and RFID *reader*

2.2 Electronic Payment

Electronic Payment System can be defined as a modern banking services by leveraging technology to improve performance and enable a wide range of activities can be carried out quickly and accurately, so that ultimately will improve productivity. Electronic payment card consists of a credit card (credit card), charge card, debit card (debit card) and cash card. There are significant differences between these cards, either the function or the consequences of its use.

Credit cards are one of the means of payment with credit consumers can shop even though at that time did not have the money. In principle, consumers shopping by way of debt. Moreover, consumers are allowed to pay the debt in installments a certain minimum number of total transactions. The minimum payment amount is usually around 10-20 per cent of the outstanding balance. In contrast to the charge card, credit card debt when payment in installments fig, it does not apply to the charge card. Each month the consumer must pay in full all the transactions that have been carried out by using a charge card. If you can not pay in full, the consumer will be charged a late fee by a certain percentage. But the charge card users are not charged any interest. Cash card is the card to withdraw cash directly through bank tellers or through Automatic Teller Machine and more recently also be used in certain tokotoko.

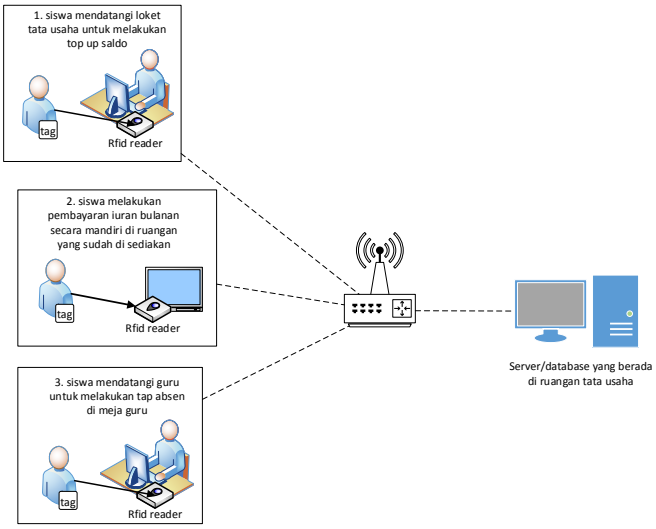
This type of card is basically not a means of payment but only facilitate customers to not have to carry too much money. While the debit card is a payment instrument, as well as credit card and charge card. Only difference is the usage patterns. The debit card requires owners to have a bank account. When the shop owner by using a debit card, the deposit in the account will be debited automatically by the value of the transaction which he did. In other words, the debit cards are also often defined as cash payments without the need to carry cash [8].

3. Contents

3.1 System Architecture

System Architecture Analysis is a process to describe the physical system to be built, the components of the system to be built include:
1. Students who already have RFID required to fill the balance in advance by visiting the counters in the administration room.
2. Students come to the room that had been reserved to pay a monthly fee independently with students to tap RFID card RFID reader.
3. For the attendance, in each class is provided a computer unit and an RFID reader tool that will students will visit teachers one by one to tap student card to the RFID reader.
4. Server or Database function to store any data that is connected with a connection Local Area Network (LAN) to any computer device on this system.

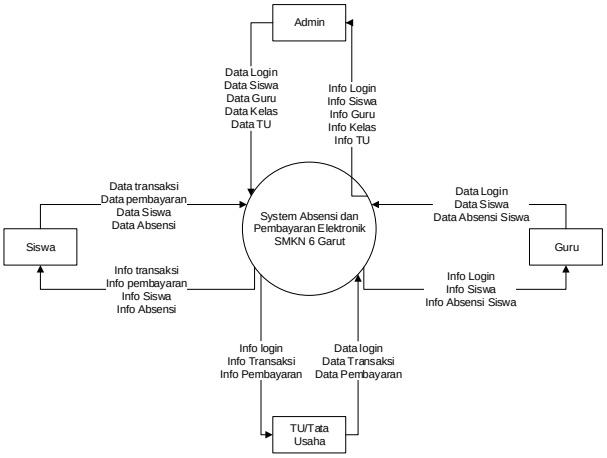
The system architecture to be built are shown in Picture below



Picture 6 System Architecture

1.1 Diagram Context

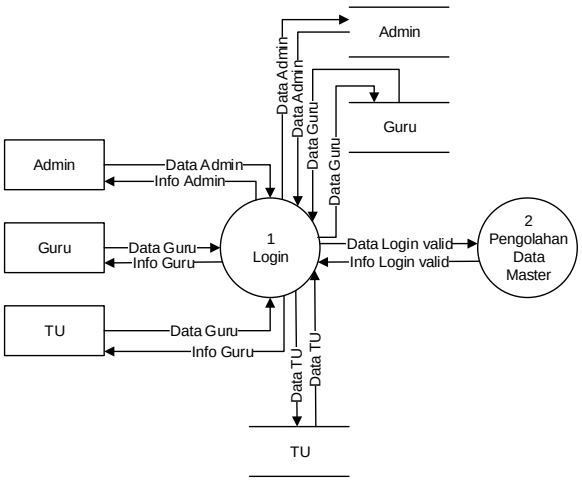
Diagram is a pattern Capture context of a process and a system Picture scope. Picture context diagram with a circle connected with outside entities involved in the system. Picture In Picture 6 is a context diagram monthly dues payment systems and electronic attendance using RFID technology in SMKN 6 Garut.



Picture 7 Diagram Context

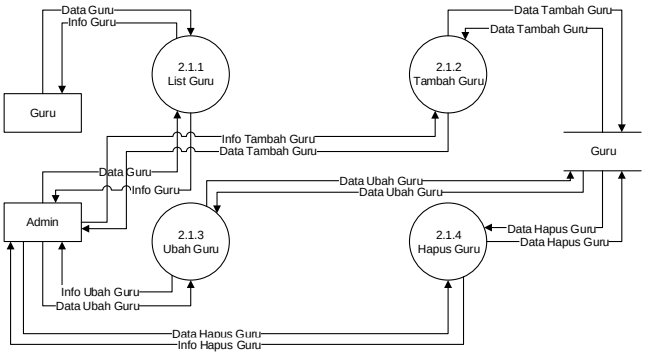
1.2 DFD

DFD is a Level 1 explaining that this application users can access the application by selecting the menu, such as logging into the system as an admin / clerical, teachers and students.



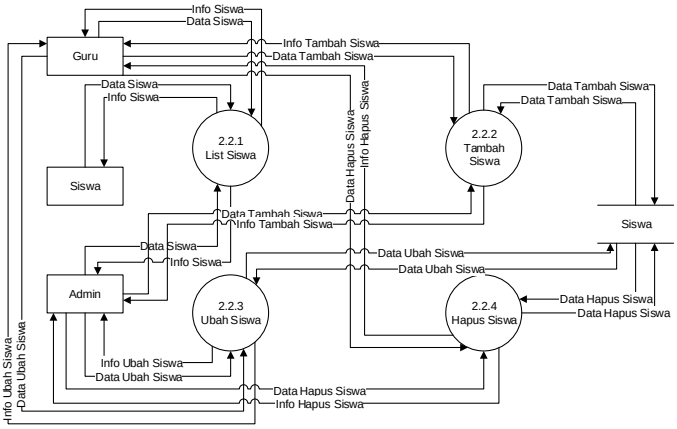
Picture 8 DFD Level 1

DFD Level 3 Processing process list of teachers consists of teachers, teachers add, change and delete teacher teacher. DFD Level 3 Processing the teacher can be seen in the following Picture:



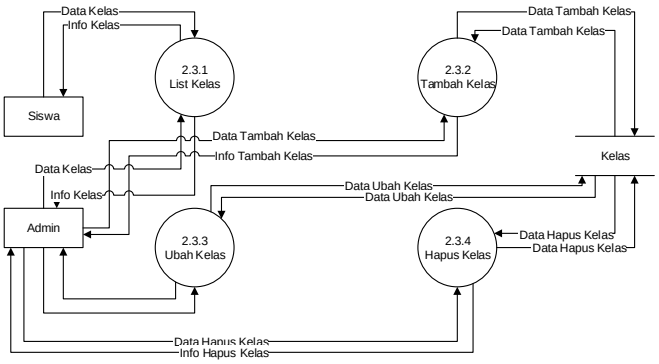
Picture 9 Processing Teacher

DFD Level 3 Processing Students process list consists of students, plus students, students modify and delete student. DFD Level 3 Processing of students can be seen in Picture below:



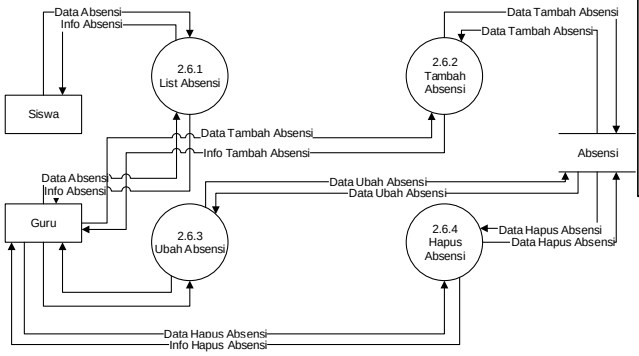
Picture 10 Processing Students

DFD Level 3 Processing class consists of classroom process list, add classes, change class and remove classes. DFD Level 3 Processing Classes can be seen in Picture below:



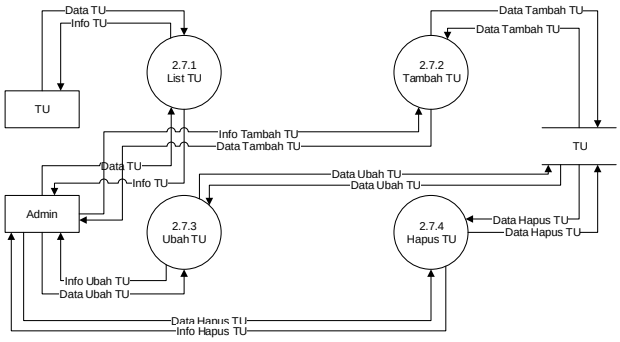
Picture 11 Processing Classes

DFD Level 3 Processing absentee process list consists of attendance, absenteeism add, change and delete absences attendance. DFD Level 3 Processing attendance can be seen in the following Picture:



Picture 14 Processing Attendants

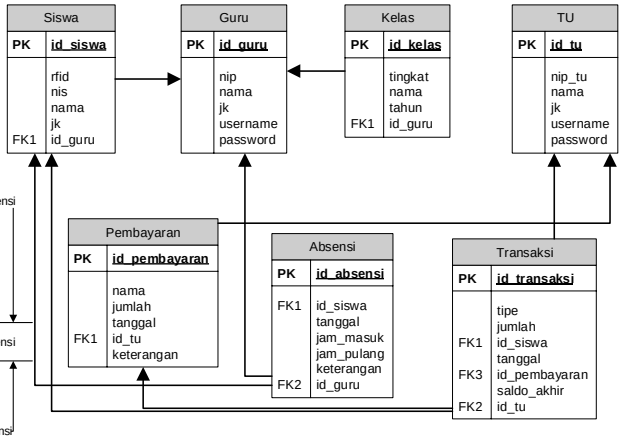
DFD Level 3 Processing administration composed of administrative process list, plus administrative, clerical change and delete administration. DFD Level 3 Processing attendance can be seen in Picture below:



Picture 15 Processing Administrator

1.3 Relation Diagram

Diagram relationships are the relationships between the tables involved in the system and diPicturekan in diagrammatic form. Here is a combination of the diagram before and after the relationship developed, can be seen in the following Picture:



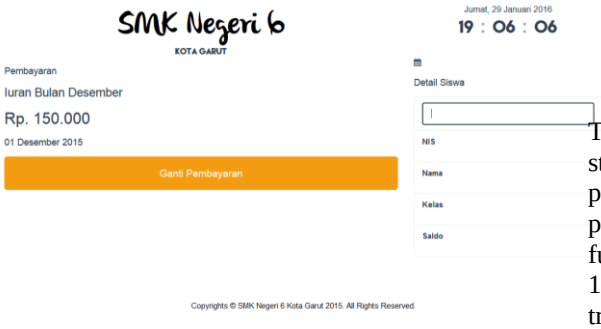
Picture 16 Relation Diagram

1.4 Screenshoot

Here are some screenshots taken from programs already running.



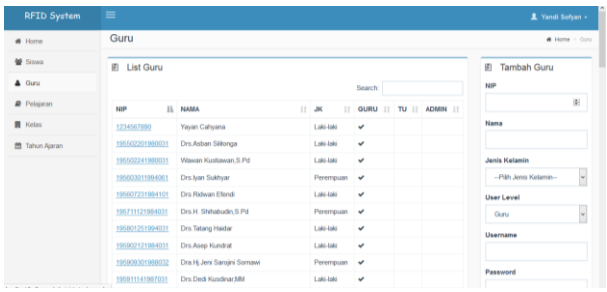
Picture 17 Main Menu



Picture 18 Transaction Menu



Picture 19 Admin Menu



Picture 20 Processing Teachers Menu

4. Closing

4.1 Conclusion

After doing the analysis phase, design, implementation and testing, it can be concluded as follows:

1. With one card payment systems and electronic absent using RFID transaction processes become more systematic monthly fee, because students do not have to hand money to the administration so that the administration can more easily to record all the students monthly dues.
2. With one card payment systems and electronic absent using RFID queues that occur during the process of payment of monthly contributions is reduced because the payment process to be faster.
3. With one card payment systems and electronic absent using RFID cheating behavior when the attendance of the student can be overcome and help teachers to record student attendance and record either daily, weekly, monthly and each semester

4.2 Recommendations

The author is aware systems that have been built are still many shortcomings. Therefore, the authors provide suggestions for the development of one card payment systems and electronic missed this for the future, some suggestions that may be done include:
1. Adding other functions such as making transactions for the function in the school cafeteria and cooperatives for the purchase of stationery and made a member of the library, by using this RFID technology.
2. Make display these applications become more interactive and it is hoped will some processes such as attendance can be done entirely by the engine computer.

REGARDS

Acknowledgements I give to some people who have helped smooth the task of late that have been made, including the Eko Budi Setiawan, Kom., M.T. As a supervisor, as well as to Dedeng Hirawan, Kom., M. Kom. As a reviewer.

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