Analysis and Design Information System Development of IT Care Application in Astra Credit Company

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Abstract. Business competition that keep intensify in automotive financing services provider field encourages all companies involved to continue improving themselves in order to competing with other companies, one of the ways is to utilize Information Technology (IT). Astra Credit Company (ACC) is one of automotive financing service provider which has already applied IT. As a big company, the large scale of the utilization of IT in ACC also raised the need for managing the IT Helpdesk. Currently ACC already uses an application to support IT Helpdesk business process called IT Care. But as the development of business process and the changing needs of the company, the system is no longer able to support business process needs. Based on those needs this research was conducted to develop system design that can meet current business needs. Design and analysis process done through System Development Life Cycle methodology with Object Oriented Analysis and Design approach using Unified Model Language diagram. System analysisist and design activities developed several processes i.e. Chart Of Account management based with time estimation, ticket submission, ticket assignment with consideration of staff balancing work load, completion ticket based on priority, also reporting of IT staff performance and ticket completion. Conclusions from the results of the analysis and design of IT Care systems are a proposed IT Care system design that is expected to overcome the problems in the existing IT Care system.

1. Introduction

Astra Credit Company (ACC) is one of leading financial company in Indonesia that focused on financing motor vehicle, heavy equipment, investment, provision of working capital, multipurpose and operation lease. ACC currently has 73 branch offices that spread across 59 cities all over Indonesia, and will continue to grow.

Information technology can help all kinds of businesses improve the efficiency and effectiveness of their business processes, managerial decision making, and workgroup collaboration, which strengthens their competitive positions in rapidly changing marketplaces [12]. The need of information technology to support business process in ACC has driven the companies to implement the use of IT in almost all cores of company business.

With such a large scale of IT utilization in the company, turn out make the IT-related problem also occurred frequently. ACC companies itself already has a department that responsible to deal with IT-related issues namely IT Helpdesk Department. To receive complaints related to IT and handle it, IT Helpdesk Department using computerized system called IT Care. IT Care is an application that received complaints related to IT from user in forms of ticket then manage it till the problems in the
ticket is resolved by IT Helpdesk staff or another IT staff in the section that related to the ticket problems category. In IT Care system that was built in 2013, there are several problems that often occurred, among others:

- Ticket completion requires a considerable enough of time even for tickets for simple problems, it is caused by problem solving of ticket is done with no consideration for the level of urgency ticket. This resulted in tickets with high urgency level not resolved first.
- Tickets that have same category problem frequently have very different working time with considerable gaps. It is because there is no standard of working time for each problem categories that should be used by IT Helpdesk staff or other IT section staff for a reference when resolving tickets problem.
- Disproportionate of task distribution for IT Helpdesk staff or staff in other IT section to resolving tickets problem. This is caused by the unclear business process for ticket assignment. In current IT Care system each staff of IT Helpdesk or another IT section can freely pick the tickets they want to handle and simple didn’t pick the tickets they didn’t want to handle.
- Ticket problem solving process often delayed for quite a long time or even completely stopped when the tickets problem required the user to attached chronological letter that describe why and how the problem occurred and is signed by interested parties for some case deemed necessary.
- There is no reporting in the current IT Care application that can show top level user about staff performance and ticket completion.

Other research with the same topic already done before in Nuclear Power Corporation of India Limited (NPCIL), India [10]. The research focused in computerized IT Helpdesk system in NPCIL which previously was done manually by filling out the services request form until the fulfilment of the service requested by user is completed.

Based on these problems the IT Care system which had been used on ACC companies is considered no longer able to support business process effectively and need to redesign so that the system can meet current business process needs. The purpose of this study is to conduct analysis and design on IT Care system that is used by ACC companies. The scope of problems that included in this study are:

- Research focused on the problems in IT Care system that is used by ACC companies including all branch companies all over Indonesia.
- In IT Care system the user category consists of: Employee, Superior User, IT Helpdesk, PIC Section, IT Staff, and Management.
- The research only conducted to produce the IT Care system design that would be proposed to overcome the problems in the ACC's IT Care system.

2. Research Methodology

Before carrying out the analysist and design process, data collection related to the IT care system was carried out with several techniques, namely: direct observation, interview, and literate study. For the analysists and design process the methodology used is System Development Life Cycle (SDLC), and the system design activities are carried out using Object Oriented Analysis and Design (OOAD) approach with Unified Model Language (UML) diagram tools. SDLC has a similar set of four fundamental phases that is planning, analysis, design and implementation [2].

2.1 Project planning

The project planning stage is where the planning process will be done towards system development. At this stage the project initiation process is also carried out and the decision is made whether the project is feasible to run or not. In this stage, if the project is approved to run, it will enter the project management stage where work plans, work assignments, and activity control processes will begin.
2.2 Analysis
At this stage the analysts process is carried out including gathering all the information related to the system. From the information obtained a list of system requirements will be compiled. Based on the system requirement all the things related to functional and non-functional system will be arranged. Business needs also defined in this stage.

2.3 Design
The design stage will defined how technically the system will operate, related to hardware, software, and infrastructure that will be used. This stage will be arranged in detail how the form of system to be built, from the system database, user interface, and program specification.

2.4 Implementation
Because the study only limited until analysts and design process, the implementation carried out is just for the design implementation process. Design implementation process will be done after the design is completed. At this stage, the design will be given to ACC companies so they can use it as references to develop their IT care application system. The design implementation process is carried out first by passing through the negotiation process with related parties within the company. Because research is limited only to the process of analysis and planning, the deployment process in SDLC is not carried out.

For the design process, the UML diagrams that is used is Activity Diagram, Use Case Diagram, Brief Use Case Description, Fully Developed Use Case Diagram, Domain Model Class Diagram, First Cut Design Class Diagram, Update Design Class Diagram, System Sequence Diagram, First Cut Sequence Diagram, Three Layer Sequence Diagram, Package Diagram, and Persistent Object.

3. Analyst and Design
3.1. Current Business Process
Current business process consists of four main process, namely: manage Cart of Account (COA) process, ticket submission process, ticket assignment process, and ticket completion process.

3.1.1. Manage COA. On ACC’s IT Care system, COA is another name for ticket category. User need to choose COA ticket to be able to submit a ticket. In current IT Care system a COA data consists of COA name, COA description, and related IT section if the problem should be forwarded by IT Helpdesk staff because the IT Helpdesk staff can’t handle the problem. Managing process of COA consists of add new COA, change data COA, and delete COA data. The managing of COA data is done by IT Helpdesk staff.

3.1.2. Ticket Submission. Ticket submission process can be done by Employee role and Staff IT Helpdesk role (only if the employee can’t submit ticket directly via IT Care system). When submit a ticket the user must complete the problem description and choose COA from COA list that available and related to the problem. Ticket that have just been added by user will get into approval process by the user supervisor’s and certain office holder (depend on the chosen COA). Next process, ticket will be entered IT Helpdesk bucket list ticket so the problem can be resolved, but only tickets that have been approved by all relevant parties can be handled by IT Helpdesk. IT Helpdesk staff will analysists the ticket problem and pick the ticket if the problem seems can be resolved, but if the problems quite complicated and can’t be resolved by IT Helpdesk staff, the ticket will be forwarded to other IT section that related to COA ticket. The forwarded ticket will enter the related IT Section bucket list.

3.1.3. Ticket Assignment. Ticket assignments are done when the ticket has entered bucket list of the responsible IT Section for ticket COA. Assignment process carried out directly by IT Section staff. Staff selects and works on the desired ticket. Tickets that have been picked up by IT section staff cannot be selected by other staff.
3.1.4. Ticket Completion. Ticket completion process is carried out by IT Helpdesk staff (if ticket not forwarded) or IT Section staff related to COA (if ticket was forwarded). To solve the ticket problem, an analyst is done first. In some cases, if the problem is quite complicated or caused by employee mistake, the chronological letter is needed. Before the chronological letter is attached, the ticket will do nothing to the ticket problems. The process of request and complement the chronological letter done manually via phone, mail, or directly. Next if the ticket problem has been resolved, the IT Helpdesk staff or IT Section staff will make changes to the ticket status to be Closed, which will then give a notification to the employee who submitted the ticket. The employee can reopen the ticket if the problem is still considered unresolved.

3.2. Business Process Design Result
To solve the problems that exist in the current system, improvements are made to the IT Care system business process that results in a business process design consisting of five main processes, namely the management of Cart of Accounts (COA), ticket submission, ticket assignments, ticket completion, and reporting.

3.2.1. Manage COA. Business process that are changed in manage COA process are addition of standard time for each COA so that it can become the basis for IT Helpdesk staff and IT Section staff when working on tickets.

3.2.2. Ticket Submission. For the ticket submission process the changes made are when adding a ticket the user must complete the level of urgency of the ticket. There are several urgency level contained in the system design that can be seen on Table 1 below (the Point column will be explained in the next sub-chapter).

| Urgency Level       | Description                                                                 | Point |
|---------------------|-----------------------------------------------------------------------------|-------|
| Business critical   | Includes problems that interfere with or even stop the company's business processes | 3     |
| Degraded services   | Includes problems that decrease service quality in the company's business processes. | 2     |
| General issues      | Covers general issues that do not significantly interfere with the company's business processes | 1     |

3.2.3. Ticket Assignment. In ticket assignment process the business process are changed so the assignment process become responsibility for PIC Section. PIC Section is a new role made so the new business process can be done. Tickets that have been forwarded by the IT Helpdesk and entered bucket list for the related IT Section will be assigned by the PIC Section to IT staff in the same section. The IT Section staff must pick and resolve all the tickets that has been assigned to them.

3.2.4. Ticket Completion. For the ticket completion process some changes are made. First, the ticket order on the bucket list for each IT Helpdesk staff or IT section staff will be sorted by urgency point. Urgency point calculate based on urgency level (describe in Table 1) and position of the user who submitted the ticket. Table 2 show urgency point for every position in ACC companies. The second change are request and complement of the chronological letter become computerized.

| Position in head Office | Position in Branch Office | Point |
|-------------------------|----------------------------|-------|
| Staff                   | Staff                      | 0     |

Table 1. Urgency Level in IT Care System.

Table 2. Urgency Points Based on Position in IT Care System.
3.2.5. Reporting. Reporting consists of reporting staff performance and reporting ticket completion on an IT care system. Reporting function will be accessible by top level users and IT Helpdesk Department. Reporting function is designed to display data with Pareto diagram format to facilitate the top level users to see the category of problems that arise most often and then create solution for that.

3.3. Functional Modelling

To create functional modelling some diagram are used, namely Brief Use Case Description, Use Case Diagram, and Fully Developed Use Case Diagram. Figure 1 displays the use case diagram resulting from the design of the IT Care system.
3.4. Structural Modelling

To create functional modelling, some diagram are used namely: Domain Model Class Diagram, First Cut Design Class Diagram, and Updated Design Class Diagram. Figure 2 below displays Updated Design Class Diagram resulting from the design of the IT Care system.

Figure 1. Use Case Diagram of IT Care System.
3.5. Behavioral Modelling

To create behavioral modelling, some diagram are used namely: System Sequence Diagram, First Cut Sequence Diagram, Multi-Layer Sequence Diagram, and Package Diagram. The design for user interface also made to represent how the system will look like. Figure 3 below displays one of Multi-Layer Sequence Diagram resulting from the design of the IT Care system.

Figure 3. Multi-Layer Sequence Diagram for One of Use Case in IT care System.
4. Results and Discussions

Analysis and design process that already done in the research process, resulting the design of IT Care system that ready to be implemented in ACC companies. The results of the design will be implemented by the ACC company developer section into an application system. The design implementation process is carried out by first passing through the negotiation process with related parties within the company.

5. Conclusions and Suggestion

5.1. Conclusions

With this research the process of analysis and design of IT care systems in ACC companies has been carried out with the following conclusions:

1. COA’s standard time feature has been added to the system design to address the time uncertainty issues required by IT Helpdesk staff and other IT Section staff in resolving ticket problems.
2. Urgency level and urgency point feature of the ticket has been added to the system design to address the problem of late ticket execution even though the ticket is important.
3. Improvement of ticket submission process has been done by determining the PIC Section as the person responsible for the distribution of tasks in the section to deal with the problem of the uneven distribution of ticket assignments.
4. Improvement of the process re-attachment of the chronological letter already made so it can be done computerized to address the problem of stopping the ticketing process due to manual processing.
5. It has been designed to add a process for reporting consisting of staff performance reports and ticket completion reports.

5.2. Suggestions

For the next system development process, the following are some suggestions that might be implemented:

1. Add questionnaires as tools to obtain user satisfaction data on the IT care system for each complete ticket submitted.
2. Expansion of system access to mobile platforms to expand the system access.

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