CERTIFICATION OF APPROVAL

Automated Vehicle Security and Registration System (AVSR System)

By

Ediwarman Bin Mohamad Taher

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Approved by,

Eliza

(Eliza Mazmee Bt Mazlan)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
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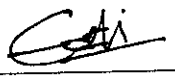
CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the reference and acknowledgements, and that the original work contained herein has not been undertaken or done by unspecified sources or persons.



EDIWARMAN BIN MOHAMAD TAHER

ABSTRACT

Number of University Teknologi Petronas (UTP) staff and students are growing from year to year. Directly to that reason, many departments in UTP such as Academic Central Services and Finance have started to use computerized system in handling most of their tasks. However, the Security Department still using manual system.

The purpose of this project is to design a system for UTP Security Department, specifically for the administration of students and staffs' vehicle management. The system will be web – based application, can be executed using normal web browser for inter – platform capabilities. The project is divided into two terms, first the research on security and registration system for vehicle and second system development on the Automated Vehicle Security and Registration System (AVSR System). Research on the AVSR System will be based on the problem statements and objectives of the project while the security and registration system for vehicle is the support idea for the project.

The purpose of this project also emphasize on the problem statement and scope of study. The problem statement section verify a few existing problems faced by Security Department staff. One of them is failure to manage too many paper documents.

This document also gives further information about the system in the literature review/theory section. This section includes the features of the system, the benefits from using the system, and the data flow diagram of the intended system.

Part of the Final Year Project, students manage to get known with the business environment on how they manage their database, registration system and the performance of the security in using Automated Vehicle Security And Registration System give the best solution for security as the database plays an important asset for the security. Capability and efficiency is the main subject in considering AVSR System.

ACKNOWLEDGEMENT

First and foremost, Praise Be Upon Allah for His Mercy has given me the strength to complete my final year project and according to requirements.

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Your assistance and ideas are really appreciated.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

The purpose of this project is to design the Automated Vehicle Security and Registration System (AVSR System) for the Security Department and the student or staff at the university or private organization, specifically for the administration of students or staffs' vehicle management. There are certain features provided by the system where the users can view the system base on their organization structure and needs in order to make the user manages the system easily. For example, the system provide option for the security department whether to register and record based on user id or can divide the user based on the vehicles type.

The system will be web based application, can be executed using normal web browser for inter – platform capabilities. The system is designed to collect data and information about the students such as name, id, driver license registration number and expiry date and vehicle information such as registration number, road tax expiry date and vehicle details. The system is also designed for vehicle registration and administration by the Security Department and while at the same time for student to register their vehicle. The systems is also able to produce reports on lists of registered vehicle owned by students, categorized by vehicle type such as motorcycle and car. The system is also able to report vehicles owned by students according to year of study, course and so forth. Temporary records such as new applicants' status, driving license validity status and road tax validity status, outstanding summons issued are also can be produced. For every summon issued, a notification e-mail will be send to the users.

1.2 PROBLEM STATEMENT

1.2.1 Problem Identification

For the purpose of safety and security, during start of the year or new academic year the staffs or students need to renew their car and motorcycle sticker at the Security Department.

The procedure followed by students or staffs needs to fill out application forms where they can get from the security department. After that, they have to pay for the sticker cost at the finance counter before applying the sticker. Usually, applicants need to wait at least one working day before the new sticker is released by the Security Department. Sometimes, the department took more than one day to produce a new sticker due to inefficiency in database management of vehicle registration.

On the other hand there is also an issue about summon by the Security Department such as summon issued not received by the driver and they are unable to know or to check their outstanding summon, unless they are called to the Security Department. This can cause dissatisfaction and difficulty to the applicants whose intend to apply their sticker.

So, with the existing if the system hopefully the issues and problems stated above can be resolved. On the other hand the system provides more systematic approach which can easily learn and understand by the user. It also provides easier procedure to the both applicants and the security department.

1.2.2 Constraint and Assumption

Constraint

For this system, there is a limitation and constraint where the notification of expired road tax and driving license only can be verified by Security Department upon the renewal of the vehicle document for every session of academic year. Meaning that any invalid driving license and expired vehicle road tax can not be detected as long as the owner doesn't renew the sticker.

The allocated budget for this system development is limited; hence it limits the features of the system where the system might be lack of user interface interactivity, etc. Therefore our system developers will solely using the in house software rather buy software that can be used for interface interactivity and so on.

This system objective is actually to provide the end user with and efficient way of Security Management and to minimize the manual transaction amongst the end user. However in this system, students and staff have to collect their sticker at Security Department. There will be a crowd during early of new academic semester where all students and staffs will renew their vehicle registration and will collect their sticker at the Security Department.

Every year, there will be an amount of student that will graduate and among them who bring their vehicle were registered with the Security Department. Every year, database administrator will need to remove the vehicle registration of graduated students manually from the database server.

Apart from constraint mentioned above, the student also facing the development constraint. The student used Planning, Analysis (Requirement Specification), Design and User Acceptance Testing phases as his system development methodology. The problems won't be discovered until system testing. The student has to take risk for any arising

problem during our system testing soon. However, as a prevention step the student can avoid the risk by ensuring that the system requirement is fixed before design phase. The student is also trying to avoid any evolution of our system requirement which can make our development unstable. Sometimes design and code work often turn up requirements inconsistencies, missing system components, and unexpected development needs. System performance also cannot be tested until the system is almost coded; under capacity may be difficult to correct

Assumptions

For this system, the student assumed that every student will only own one type of vehicle either a car or a motorcycle. In case they want to register another vehicle on the same name, the previous vehicle registration must be eliminated first.

Assuming that each vehicle registered is under the student name as the owner of the vehicle will ease the process of identifying and tracing the vehicle. Beside that it will help to directly identify the owner of every vehicle registered.

As the medium of communication between the end user with the system administrator, the student will use the e-mail account. So another assumption is every student will have their own e-mail account. Any notification and inquiries will be sent directly to the recipients via e-mail.

The sticker renewal must be done every one academic semester, meaning that it is compulsory for each registered vehicle to update their registration to the Security Department every one academic semester. By doing this also can help database administrator to trace which vehicle is no longer available in campus and deletes the registration.

Another assumption that the student made is every misconduct is done by the vehicle owner himself. For example if the summon issued for improper parking where the owner wasn't at the vehicle, summon will be issued referred to the vehicle's registration number. Even if the vehicle is used by someone else, the summon is still issued to the vehicle's owner.

1.3 OBJECTIVE AND SCOPE OF STUDY

1.3.1 Objective of Study

1. To introduce an efficient way / method of university or organization security management on vehicle registration and administration

2. To provide a secure surrounding of campus whereby it is easy for the guards to go around and at the same time keep their eyes on the cars.

3. To improve communication between Organization Security Department and drivers, especially student by implementing this new system in the current system. Furthermore it help to ease the user thus improves the communication between all the parties.

4. To reduce paper usage as the system is fully automated and can be accessed by staffs and students online.

1.3.2 Scope of the project

This system is to be developed within two to three month period of time. It will cover the online sticker application for motor-vehicle, a section for UTP staffs and students to check their outstanding summon and list of memo and announcement made by Security Department. This system consist three modules, which is developed for Security Department, other staff in UTP and students.

The Security Department staff will be administrator for this system. They have the privilege to check and add new summon if any of the UTP member has go against the rules. Those people will remain through email by the system once in a month until they have paid compounds. They also update the system with information such as vehicle sticker application, new memo and etc.

The other two modules developed for other UTP staffs and students. Each of these modules allows its user to access the motor-vehicle sticker registration page, check outstanding summon as well as the list of rules and regulation in UTP.

In order to come out with manageable project scope, five processes should be undertaken, they are scope initiation, planning, definition, verification, and change control. Beside that, it is important for any developer to strictly develop and follow the scope of a project, in order to keep it on track. By doing so, there are more chances for a project successful.

After the survey phase has been conducted, a scope statement has been established. This scope has been refined after study phase. This scope statement includes business subjects, business functions and operating location. The business subjects and business function define the scope for data and process respectively. From the scope defined, the developer will have idea about information that will be needed by the system. Besides that, list of ongoing business function that would be included in or affected by the system

also been determined. All information and process involved in the project will be depicted in the *Appendix 1, Data Flow Diagram- Level 1.*

The operating locations define the scope for geography. Only who are in UTP area that can access to the Local Area Network can use this proposed system. As the system is applicable to those in UTP, so it is the best solution that the system should be developed on the intranet basis.

1.3.3 Relevancy of the Project

It is very relevant to implement Automated Vehicle Security and Registration System (AVSR System) base on current UTP environment. Most of students are able to access to the system, as their hostels are equipped with Local area Network (LAN) connection. For students who did not have a computer or their hostel not equipped with the LAN connection, they can access the system from the computers labs. In addition, due to the small scope of the project, it is belief that the project is relevant to be finished in 14 weeks time.

1.3.4 Feasibility of the Project within the Scope and Time Frame

It is feasible for this project to be accomplished within the scope and time frame. Due to the small scope of the project, it is expected to meet the dateline, which is end of this semester.

CHAPTER 2

LITERATURE REVIEW

In an organization, good communication, centralized system and secure systems are the most critical factors in order to success in their business. This situation is also applied in our university. We know that during start of the year or new academic year the staffs and students need to renew their car or motorcycle sticker at the Security Department. For organizing the registration and problem perfectly, it will automatically lead to good reputation for the UTP Security Department among the other department in UTP.

From this, we can conclude that UTP must have a system for Security Department and the students or staffs, specifically for the administration of students or staff vehicle's management. The system must also be able to produce report on list registered vehicle owned, categories by vehicle type such as motorcycle or car. On the hand, this system will capture all written and verbal summon issued by security officers to drivers into a manageable system and format

Using this system, UTP Security department will act as the administrator for the system. The administrator will administer the operations of the system according to the effectiveness of the system, its functionality, etc. Meanwhile, the students and staffs will be the person or organization that initiates the system. By using this system, Security Department can easily update and manage the vehicle registration quickly and systematically. Lastly, Security Department also can notify all vehicle owners to collect sticker easier according to availability, saving owner's time.

2.1 A solid technology infrastructure and safer roads.

Unisys and LTSA have addressed a variety of road safety issues via implementation of several projects. For example, in 1998, Unisys designed and implemented a Drivers Licensing Register (DLR), which it has subsequently been managing and will continue to manage for its duration through 2005. Unisys ensured integration across all systems, from the instant cameras taking the pictures to the registry system, through to the system producing the cards. Unisys helped LTSA roll out the system to 150 sites in less than six weeks. During the first year that the system was in production, LTSA produced more than 2.5 million photo drivers' licenses.

According to Tony West, General Manager, Information Systems and Technology at the LTSA, another project for road safety includes the Warrants of Fitness (WOF) recording system and the ability of garages to use a Virtual Private Network (VPN) to complete WOFs online. Approximately 12,000 WOFs are completed each day using the Internet-based service, making the WOF Web site one of the largest government-to-business e-commerce sites in New Zealand.

One project that has been particularly instrumental in ensuring road safety has been the Motochek system, which allows online access to vehicle history and ownership information. Thus, when someone is purchasing a vehicle and requires financing, both the prospective owner and lender can use the Internet based Motochek system to ensure that the vehicle details provided are the same as those on the motor vehicle register.

Similarly, the Driver Check system enables pre-registered users such as fleet operators or car rental companies to access the Internet and check the license status of their vehicle drivers. Not only does this ensure the safety of the vehicles for their owners, it also provides savings for fleet operators and rental companies by helping them avoid having a vehicle impounded for 28 days, which is the legal ramification of driving without a valid license. Additionally, fleet operators can load employee driver information into the system and be notified of any changes in an employee's status.

2.2 Supporting information

From the Resources Link website, a workshop has figure out that a system approach is important in managing any project, including this computer system project.

"Functional and operational safety start at the system level. Safety cannot be assured if efforts are focused only on software. The software can be totally free of "bugs and employ numerous safety features, yet the equipment can be unsafe because of how the software and all other part interact in the system. In other words, the sum can be less safe than individual parts! Thus, a system approach is needed."

In addition, according to Tom Mochal, project management processes and techniques are used to coordinate resources to achieve predictable result. However, it should be understood that project management is not totally a science, and there is never a guarantee of success. Because projects involve people, there is always complexity and uncertainty that cannot be absolutely controlled.

So, project management is also partly an art that requires flexibility and creativity to being successful as well. It is a science because it relies on proven and repeatable processes and techniques to achieve project success. It is an art because it has a lot to do with managing and relating people. Therefore the project manager also must rely on people management, good judgment, interpersonal skills and person intuition.

A good project management methodology provides a framework, process, guidelines and techniques to greatly increase the odds of being successful, and therefore provides value to the project and the Project manager.

Besides that, feasibility study is part of phase I of the Function Analysis System. Techniques which are the survey phase. The objective of the feasibilities study is to provide the sufficient level of detail for an informed decision to be made on whether a project to create, modify or purchase an Information System should proceed. For this

project, the feasibilities study will help the author to determine whether the project os worth looking at.

Scott W.Ambler (August 2000) point out that feasibilities study is an essential process in system development. He said that an important part of initiating a project is justifying. This will help to determine whether or not it should be built. Unfortunately, justification is the task that is often the most poorly done. A study has shown that 85 percent of large project fail due to the wrong justification made early in the development phase. The main goal of the justify stage is to define the best implementation solution for the project.

In addition, the author has realized that the requirement analysis phase is very important in developing a system. An appropriate and accurate study should be conducted at this phase. A system development is successful only if it satisfies business specifications and fulfills user requirement.

From a workshop conducted by Mr. Sammarco, which is included in the Resource Link Website, failure of a system usually because of mistake make during the requirement phase. The following pie chart shows the percentage of cause of system fault and its brief discussion taken from Resource Link Website.

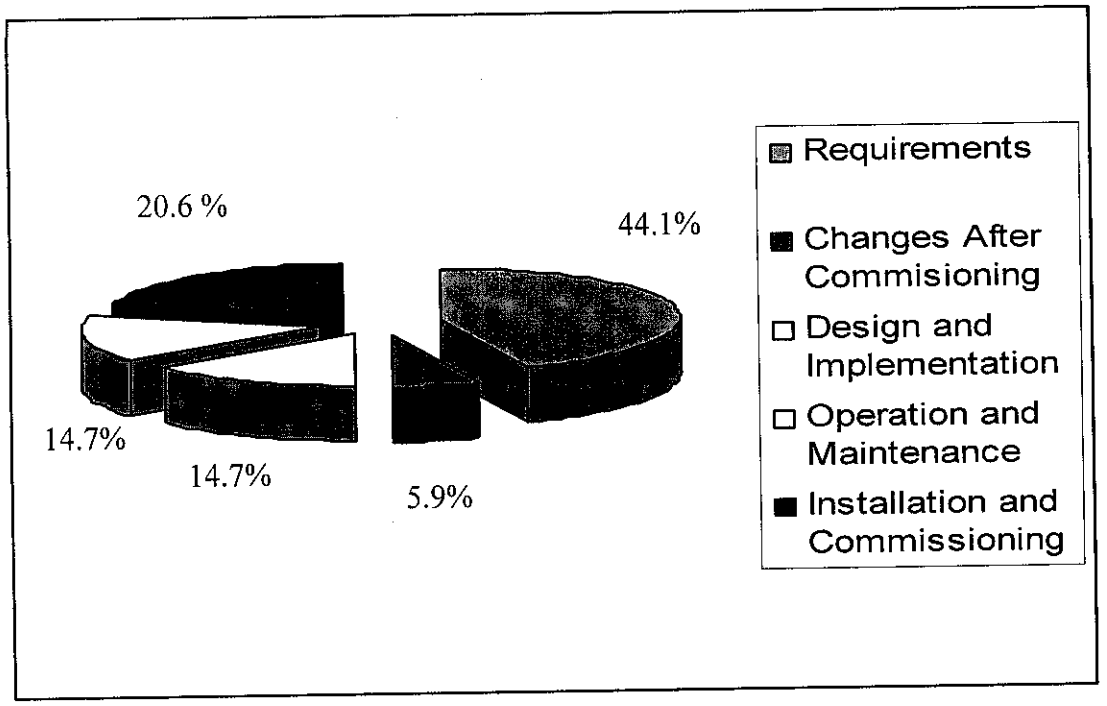


Figure 2.1 Cause of The System Fault

"Most causes of the system faults are created before the first line of code is ever written on first schematic are ever drawn. The errors are caused by not understanding the requirement of the system. One simple way of understanding the requirement is to ask yourself how you test this requirement. If you can't specific a test that can clearly show that the requirement has been meet, then the requirement or the understanding needs refinement."

In addition, from the workshop, good information is realized. The earlier in the design cycle that the requirements are clearly understood the lower the cost of any needed changes.

CHAPTER 3

METHODOLOGY

3.1 Methodology

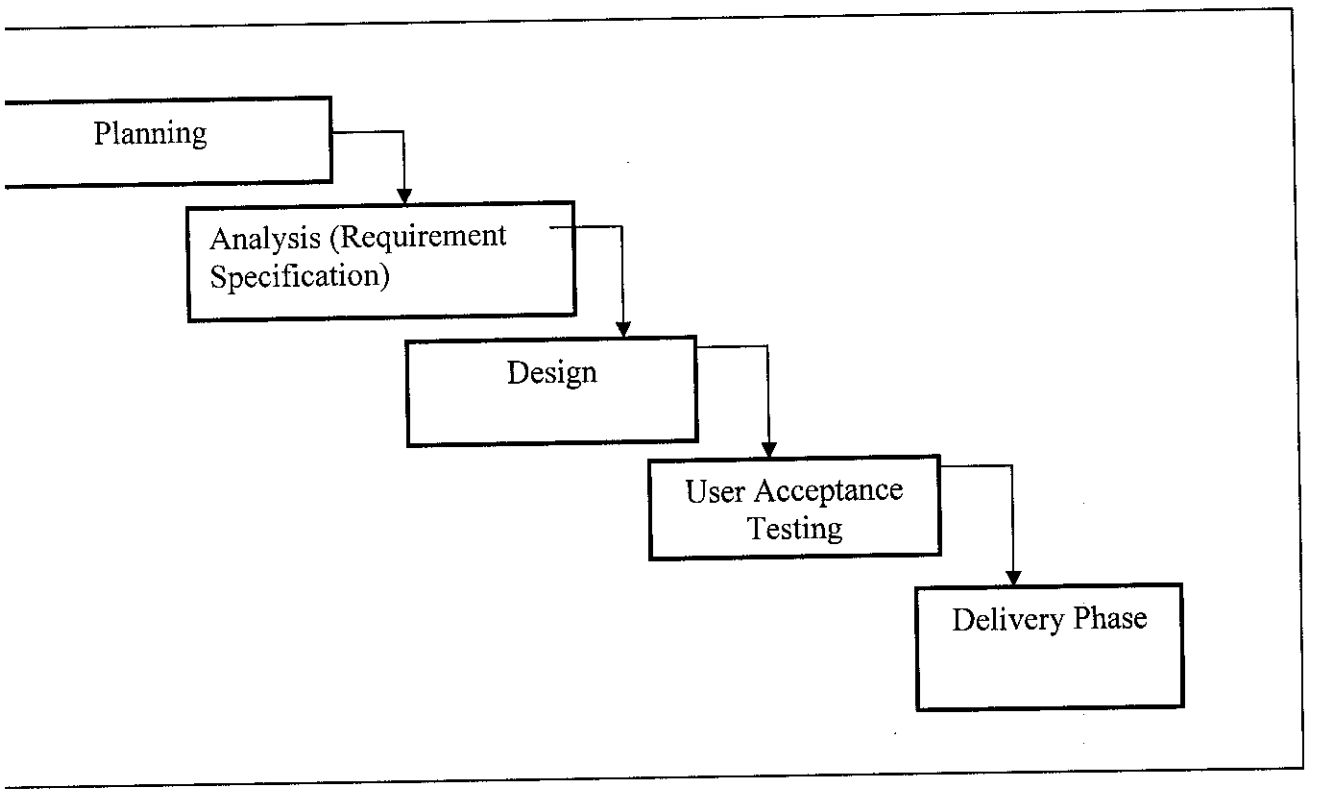
Research and developing the Automated Vehicle Security and Registration System need student to adapt software engineering paradigm as a discipline that integrates the process, methods and tools in the system development. Student used System Development Life Cycle (SDLC) to ensures consistency and reproducible in the development area. SDLC also reduce risk associates with mistakes and shortcuts and enable to produce complete and consistent documentation for the projects. Planning, Analysis (Requirement Specification), Design, User Acceptance Testing and Delivery phase are five basic terms in SDLC. These terms are used according to SDLC model such as Waterfall Model, Spiral Model, Hybrid Model, or Prototyping. Each model has own advantages based on the project specification and requirement.

Building a system based on the web based application needs a repetitive model combined with prototyping. These five basic terms of SDLC is the best project development life cycle methodology. Iterative development ensures system is developed according to the module and constant review and testing are key element in the development process. Therefore these five basic terms of SDLC is suitable in the development process which allows the student to review each stage in the development process and testing procedures upon to the web environment model.

The development process begin with the student will play the role of the user and database administrator in defining problems, objective and requirement. This is achieved by soliciting the domain expert on the knowledge where knowledge is plays an important part on the development. Knowledge is both the understanding on the main problem and the user requirement to solve it. UTP Security Department procedures and student's supervisor is the domain expert that will serve as the main reference in understanding the requirement and procedure.

Design and module development are the next procedures in the development process. Knowledge administrator will represent the knowledge acquired from interview and research is developed to solve problems according to the user environment. Knowledge administrator and the domain expert will review each completion of the modules and integration part will be conducted as the modules are completed based on the requirement.

To make the project become easy and successful to develop we implement five phases that is Planning, Analysis (Requirement Specification), Design, User Acceptance Testing and Delivery for the System Development Life Cycle (SDLC). This five phase model describes a sequence of stages in which the output of each stage becomes the input for the next. These stages can be characterized and divided up in different ways.



3.2 Project Planning

This project planning is based on the student proposed timeline that has described earlier in the project Gantt chart *(refer to Appendix 2).* Student has to follow certain stages in the project development life cycle based on the selected hybrid methodology which are planning, analysis (requirement analysis), design, user acceptance testing stages and delivery phase. Besides these five stages, there are also other stages in the project development life cycle such as testing and costing which student has to consider in completing the project.

In project planning phase, the student has done some research in searching suitable topic for the Final Year Project. The student has discussed and finalizes the appropriate topic for the FYP. The topic is Automated Vehicle Security and Registration System (AVSR System). The system has been purpose to design the Automated Vehicle Security and Registration System (AVSR System) for the Security Department and the student or staff at the university or private organization, specifically for the administration of students or staffs' vehicle management. There are certain features provide by the system where the user can customize the system base on their organization structure and needs in order to make the user manage the system easily. For example the system provide option for the security department whether to register and record based on user id or can divide the user based on the vehicles type. After the topic has been approved by the FYP committee and supervisor, the student discussed the topic with the FYP coordinator for further information about FYP. Then student continue to the next step in completing the Final Year Project. After identifying the topic, the student has done some analysis about the topic selected. The activities include search for the literature review and supporting materials relevant with the topic. The student also collects some material about the existing manual system related to the topics. Materials include type of form that involved, procedure and policy used by the system.

3.2.1. Preliminary Study

In preliminary study phase, student starts the project by doing research on the topic. This study phase will give a better and appropriate understanding of the business problem domain by analyzing the existing system. The research is done using several data gathering method such as interviewing with students and staffs, internet searching, experience from the industrial internship, and also from the books and journals. In order to have a clear view of the existing system (process) undertaken in the Security Department, a informal interview has been conducted with the manager (Major Elias B. Hj Nasir) and a few staff of the department on 5 March 2004. During the interview session, each of the process perform by Security Department staff has been explained in details. Mr. Lakhbir also provides all forms that are related to the project such as Application for Sticker and Summon notice to facilitate this phase. The developer task will be easier in determining which information is required by the system in later phase by using form given as references

Student starts collecting all relevant articles and literature review on the topic in order to support and become the main references for the project. The preliminary study discussed about the overview of the topic, Automated Vehicle Security and Registration System. Student only focused and identifies scope, objective, methodology to be used and constraint that will be the most important part in the project. Scope and objective must be identified first and it must be reasonable and relevant to the topic. Methodology will be the guide in the completion of the project. Student will schedules all the phases in the project according to the methodology used. Constraint must be determined such as time and cost in order the student for not to costly for the project and the time is being managed effectively. Student gathers the data and information from questionnaire (*refer Appendix 3*) and then the information will be translated into knowledge based.

3.2.2 Survey Phase

Before undertaking any project, it is important to ensure that the project is worth looking at. For this purpose, a survey has been conducted though the distribution of questionnaires. There are 80 questionnaires that have distributed among student of different year in UTP. The questionnaire with the student study years are as the following:

Fifth year student	20 questionnaires
Fourth year student	20 questionnaires
Third years student	20 questionnaires
Second year student	10 questionnaires
Foundation Student	10 questionnaires

These questionnaires have been allocated just for the student because this is only survey phase. In this phase, it is just to make sure that the end user especially students who always having problem in applying sticker and summon conformation agree that this system should me develop to ease their application. More questionnaire are distributed to the third, fourth and fifth year students because most of them ride/drive motor vehicle compare to those first and second year student.

Besides that, as the security department staff will be the administrator of the proposed system, an informal interview has been conducted with them. This is to confirm that they would not oppose the system proposed. Once the author confirmed that this project is beneficial, activities for the project will be planned. The Gantt chart for the plan project timeline is presented in the *Appendix 2.*

From the survey conducted, the project scope and budget are established. The project scope is in the section 1.3.2 Scope of the Project, and the budget is available in Chapter 4,

Result and Discussion. From this survey phase, student took all the information and knowledge from research and questionnaires bring it to the next phase, Feasibility Study.

3.2.3 Feasibility Study

Feasibility study is one of the important parts in the project planning. In feasibility study, the student must consider some constraints in completing the project. Three most important constraint for the project are time, scope and cost. Time is the highest priority where student must determine all the tasks must accomplished in order to complete the project. From the tasks, student must determine time needed for each of the tasks. Gantt chart is the tool that student used in planning the time frame for the project. The time given from the FYP committee is fixed and student must overcome and managed effectively for successful of the project. Scope of the project has been determined earlier at the preliminary phase. Scope is important where it can guide the student in completing each tasks and objective of the project. Student must determined topics that related to the project and the user requirement specification. The topics have been discussed with the supervisor to get more details on the FYP requirement. Cost is considered as own cost where student will used own money to overcome cost occurred during the progress of the project. From the feasibility study, student will know the feasible of the project, how to manage time which has given by the FYP committee in order to complete the project, the scope regarding project research and system development and cost that will occurred and how to manage it.

Usually there are numerous alternative ways to design the new system. So this phase will help to identify and analyze alternative solution as well as recommend a target system that will be designed and implemented.

This phase begin with the feasibilities study. There are four areas that should be feasible. They are the technical, economic and schedule. This study is conducted on the proposed system in order to ensure whether the systems comply with any of the following options:

- The system budget and time has to be increased as the scope has significantly expanded.
- The system scope needs to be reduced.
- Need to find another alternative solution for the system.
- Stop the project

3.2.4 Project References Research

This phase involved student in data and information gathering from various sources such as internet, interviewing, questionnaire and reference books. The finding must be related to the topic, Automated Vehicle Security and Registration System (AVSR System). From the finding, all these material (data and information) will be used in completing the project and to support the system development.

3.2.5 Prepare the Preliminary Report

Preliminary report is the final output from the project planning phase. In the preliminary report, it discussed the objective of the project, introduction of the project, scope, methodology being used for the project, literature review to support the project, discussion and recommendation for the project. To write down the report, student must follow the guidelines which have been provided earlier by the FYP committee. The report submitted to the FYP supervisor for marking and other detail explanation if needed.

3.3 Project Analysis (Requirement Specification)

Project analysis phase involve analyze problem statement from the preliminary report and solve it as the project's product. Student specified certain problem and aimed to solve the problem as the project objectives. The final outcome of this project analysis phase would be the completion of system requirement documentation which detailed about the problem analysis, requirement analysis and specification and, data process and object modeling.

3.3.1 Problem analysis

Problem analysis is done in order to get well-known with the problem statement which stated earlier in the preliminary and feasibility study. The analysis shows the relevancy of the topic with the current problem. From the analysis, student divided into two parts, the research and the system development parts. Student must divide these two parts equally and time must be managed carefully as the time constraint is very limited.

In research part, student must identify the overall problem and objective in business environment in term of Automated Vehicle Security and Registration System (AVSR System). To make the case or the problem more detail, student has selected University of Technology Petronas (UTP) as the entity of the business in the research. . The student does some research on the AVSR System best architecture design, performances, basic requirements and system requirement specifications. The student use internet and search other related material at library, questionnaire and interview in making the research of the topic All these findings will be used in completion of the System Requirement Documentation. The research will take about two weeks to complete the findings and complete literature reviews to support the project. The student only focuses on the basic requirement for system functionality. These basic requirement will be discussed more detail in the System Requirement Documentation.

For the system development part, student identified what the functionality of the system and the requirement needed to accomplished the system. As been describing early, the system is design to record and update the user personal information while register for their vehicles. By using the system, students can register and update their vehicle information online, thus eliminates the need of filling out forms and going to multiple departments when applying for stickers. Security Department can easily update and manage the vehicle registration quickly and systematically. To capture all written and verbal summon issued by security officers to drivers into a manageable system and format. Student and Security Department can check for any outstanding issued summons online for further action such as student can resolve out their summons before getting

blacklisted by the department and vice versa. Security Department also can notify all vehicle owners to collect sticker easier according to availability and saving owner's time.

3.3.2 Requirement Analysis and Specification

This is the most important phase of the lifecycle. It is sometimes called requirement analysis. At this phase, users will express what they need or want out of the system. The requirement to be analyzed includes data, process and the interface. In. addition errors and omission of data and information at this phase will result in user dissatisfaction with the new system.

The objective of this phase is to gather and analyze user requirement. So, other users' expectation of the system should also be taken into consideration. Another questionnaire concerning the system requirement (including the feasibility, flexibility and reliability of the new system) has been distributed to some staffs and students. This is a new set questionnaire, which is different with the distributed during the Survey Phase. The questionnaires also unlike the first one.

There are hundred questionnaires that have been allocated to students from all study years. However, only ten of them are distributed to the first year students. This is based on the result gain from the distribution of the first questionnaire where most of the first year student did no drive/ride vehicle. Yet, their requirements are still crucial in some part of the system. In addition, this will avoid bias in this requirement analysis phase

Fifth year students	30 questionnaires
Fourth year students	20 questionnaires
Third year students	20 questionnaires
Second year students	20 questionnaires
First year students	10 questionnaires

As part the staffs are another group of end user, they also have been involved in this phase. Apart from those contributed to the students, there are twenty questionnaires distributed to the staff from various areas.

The system is designed into 3 major parts of the system requirement specification. There are system application, administration and the system feedback.

System Application

This is the functionality of the system itself. All the detailed information of the user will be collected during the application. The information include the user details like user name, id number, contact number, address, email and some optional features for the university student such as year of study and course. Other than that the vehicle details such as vehicle registration number, color, ownership, model. The system also provides an optional whether to record and class the vehicles based on its types for example like motorcycle or car. Lastly the Applicants' driving license details and vehicle road tax details also have been record to ensure that the vehicle comply with JPJ rules and regulations

Administration

This is what will be view by the security department through the system. The report of the registered vehicle list and their ownership status, issued and outstanding summons will be generate by the system. Other than that there are also include Students' applications of new vehicle registration status and record issued summons by officers and cleared summons by students. This is for the purpose of this is to give the security department the current status of the user whose want to apply through the system.

System feedback

This is what is provided to the user whose using the system. The user will be notifying on expired driving license or road tax and outstanding summons that exceeded the warning limit (i.e. 3 summonses). There is also verification of input during new vehicle registration applied by the user whether the license and road tax are expired and there is

invalid vehicle registration number. Other than that the user will be given the feedback about the status of their registration whether successful or fail.

3.3.3 Data Process and Object Modeling

Data process and object modeling is used in developing the Automated Vehicle Security and Registration System (AVSR System). The purposes are to make sure the entity for the system and the data is smoothly functioning and the workflow for the system is correctly used. In this phase, the student used system flow model and the system architecture design model to illustrate the design of the data process and object modeling. The system flow model shows the workflow of the system and how the system is integrated from one object to another object. As any changes made to the system, the system flow model also will be changed. Student used the system flow model as the workflow of the system and as the guidance if the student has a problem when coming to the development phase.

3.3.4 System Requirement Documentation Submission

The output of analysis phase would be the submission of system requirement documentation. In this documentation, student will explain more detail about the FYP than the preliminary report. The report specified more detail on system flow model, database architecture and the technical review of Automated Vehicle Security and Registration System.

3.4 Project Design

This design phase will include four main sub phases which are architecture design, interface design, database design, and testing and debugging phase. The project phase is the most important phase in project development where if the project design failed, the other phases in the project development cannot be continued. Student must

keep alert in this phase and the outcome from this phase, design and requirement review will be used in the development phase later.

3.4.1 Architecture Design

In architecture design, student use the system flow model in designing the system. This process is to identify the process flow that will be use to design interface and module design. It is to define the interaction of all the system entity with the system .The outcome of this process is to come up with the architecture of the system which involve the process function, system database and external entity that will interact with the system. The architecture will describe on the relation between all the entities of the system. This will include basic system requirement, hardware requirement, software requirement, tools used and also the list of system functionality. All information and process involved in the project will be depicted in the *Appendix 4, Data Flow Diagram.*

3.4.2 Interface Design

The main guidelines for this stage would be developing story board for user interface design. This storyboard will highlight each page in the website interface with the functionality and system flow included. As for this, the main outcome for this stage would be user interface prototypes that would be the student initial interface design and outline.

3.4.3 Database Design

In database design, student prepared database architecture for the Automated Vehicle Security and Registration System. Backend design of the system will include relation database, file database and user information database. The system use MySQL as the database architecture. MySQL was chosen because of the availability of the software and the most suitable database tools to be integrated with PHP software. All information which is key-in by the user will be stored in the database. The information will retrieve if the is any changes or upgrading procedures occur to the database configuration. All

information and process involved in the project will be depicted in the *Appendix 5, Database Structure (ER Diagram).*

3.5 User Acceptance Testing (Testing and Debugging)

Testing and debugging procedure is done when the web interface and database architecture is completed. The purpose of this phase is to test whether the database is functioning as the student expected and to test integration between database, flow of the system and the interface. The test and debugging phase only focused on the small units of the system. This phase also sometimes called unit testing. After this phase is successful, the integration testing will be take place in order to make sure the system is function as the requirement and objectives.

3.6 Delivery Phase

The new system will be place into the operation

3.7 Hardware and Tools

3.7.1 For development

Software:

Macromedia Dream weaver MX

This software will be use for suited for Web development and can be embedded into HTML, Flash, XML, ASP and other programming tools. It offers an intuitive environment for building cross-platform sites and will be use for interface design and content layout

Adobe Photoshop

With its comprehensive set of retouching, painting, drawing, and Web tools, Photoshop helps to complete any image-editing task efficiently. It will be use for system cosmetics

SQL server

This software will be use for the creation of the database. The database will be used to store any data such as username list, password, multimedia files and others. MySQL were choose because of the application is the most suitable database tools to be integrated with PHP software.

Web browsers

This software will be use for testing and debugging application features

Hardware: Workstation with minimum specification to execute the above mentioned software.

3.7.2 For client usage

Software: Compatible operating system with recommend browser to browse the application such as (Windows 98 and above with Internet Explorer 6 or Netscape Navigator with Java supported)

Hardware: Personal computer with minimum specification to execute the abovementioned software.

CHAPTER 4

RESULT AND DISCUSSION

4.1 RESULT AND DISCUSSION

This deliverable main describe how the different system component will relate to each other. The deliverable of this process will affect implementation design of the system component based on the design that is done parallel with the other design process. It is to decide the technology that will be use for the system component and the communication between all of the related components. Below is the table that shows the system component and its infrastructure design.

System Component	Concept	Technology/Programming Language
Interface	Web Enable Technology	HTML
Input Verification	Client Site Scripting	JavaScript
Database	Relational Database	MySQL
System Interface and Database Communication	Server Site Scripting	PHP
System Process	Server Server Site Scripting	PHP
System Output and Report	Server Server Site Scripting	PHP

4.2 Result of Finding –Questionnaire

A research to find out whether the UTP Security Department should implement an online system had been conducted early in the development phase. In the Survey Phase, 100 questionnaires had been distributed to 100 students ranging from 1st year to 5th year. Base on the questionnaires distributed, the following results have been obtained.

4.2.1 The Relevance of Developing the Automated Vehicle Security and Registration System

Data Gathered:

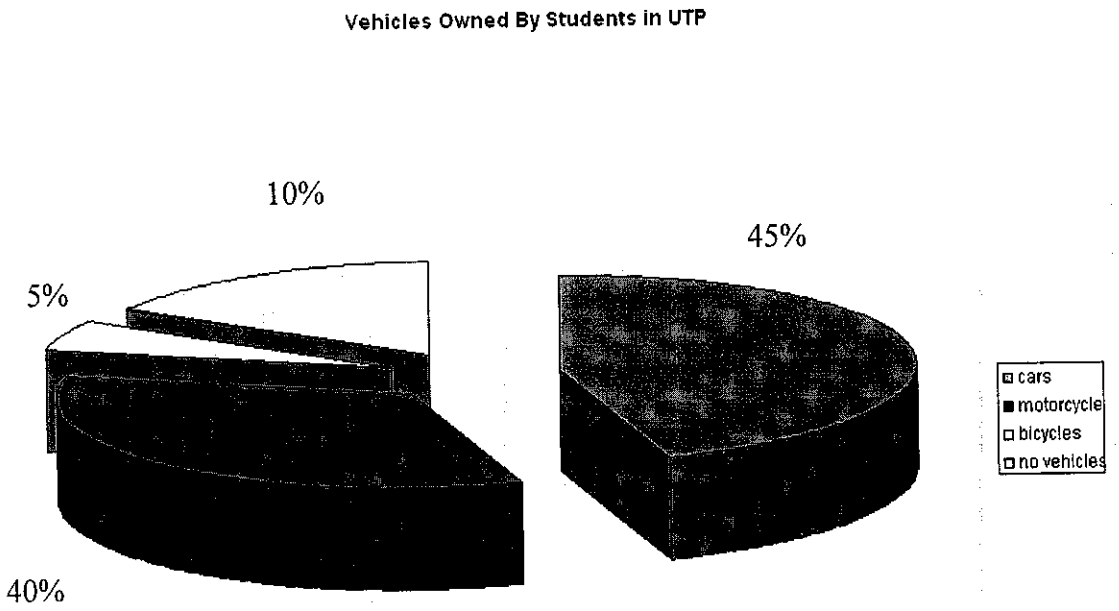


Figure 4.1

Discussion:

Figure 4.1 show that 95% from 100 students, which participated in the first questionnaires, have their own vehicles. Only 5% from the 100 student did not own any time of vehicle in UTP. To be more specific 45% of student owns cars, 40 % own motorcycles and 10 % own bicycles. So it seems that majority of the students own cars.

Data Rationale:

From the result gained, it can be concluded that big portion of the student UTP owns vehicle. In addition, through observation made by the author, the numbers of cars own by student UTP are increasing from year to year. This interference has been drawn out base on the inadequate parking lot at hostels (Village 2,Village3 and Village 4) that resulted most of the cars are parked at the roadside.

According to most the student, it is easy for them to move around with their own vehicle. Vehicle such as car and motorcycle must be registered with the Security Department to get sticker, it is worth for the department to implement the proposed system as most of students own cars and motorcycles.

4.2.2 The Rationale of Developing the Automated Vehicle Security and Registration System

Data Gathered:

Student Opinion on the Current Sticker Application System

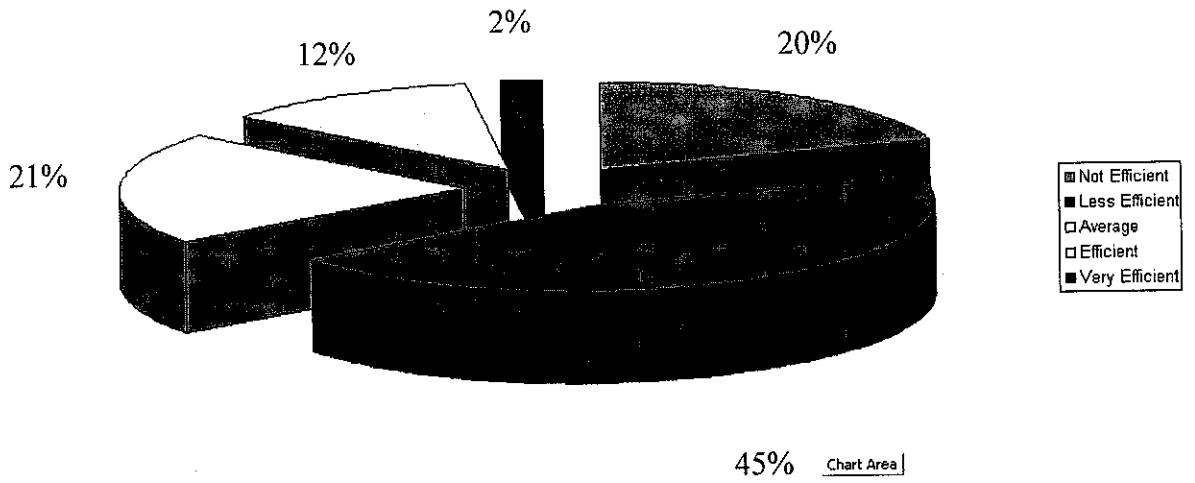


Figure 4.2

Student Opinion on the Implementation of the Automated Vehicle Security and Security System

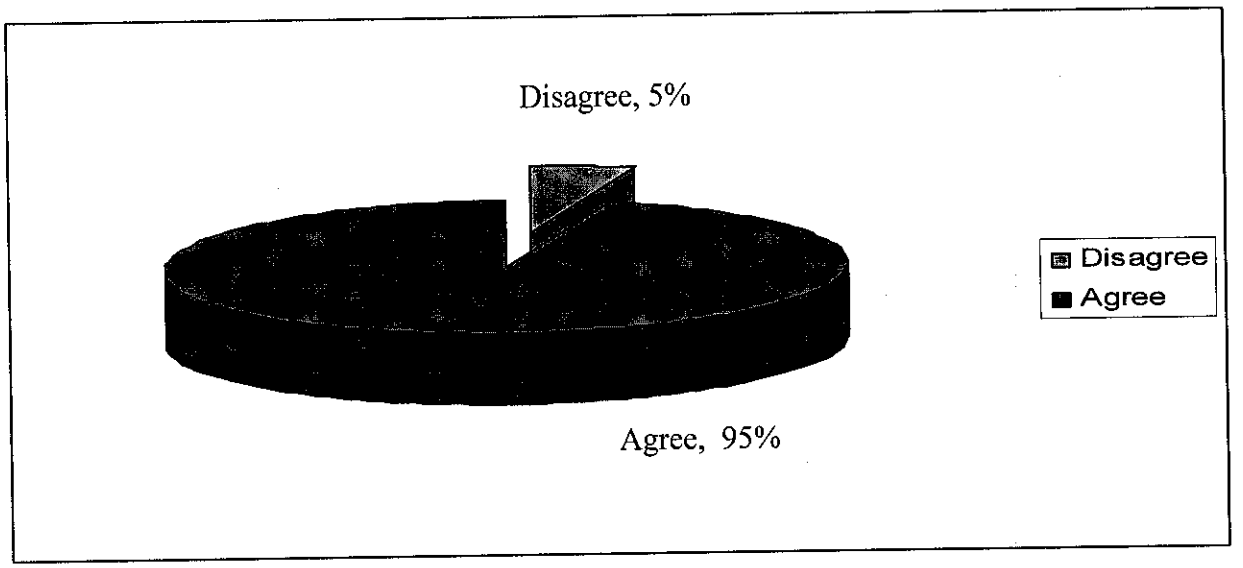


Figure 4.3

Discussion:

From Figure 4.2, it seems that only 2% of the students felt that the current system is very efficient. The other 12% and 21 felt that the system is efficient and average respectively. 45% of them felt that the current system is less efficient while 20% of the students felt that current system is not efficient at all.

Figure 4.3 show that majority percentage of 95% agrees while 5% disagrees with the implementation of the Automated Vehicle Security and Registration System.

Data Rationale:

According to the survey conducted, more than half of the students are not satisfied with the existing system use by the Security Department. Among the factors that contribute to the dissatisfaction are misplace or missing document that have been submitted for sticker application such as the application form, photocopy of the vehicle's grant and etc.

Moreover, the current system's process taken longer time than it is supposed to be. For instance, the sticker application process, which can be completed. Besides that the applicants need to go to the Security Department for a few times to check the stickers as they will not be notified whether it is ready to be collected or not.

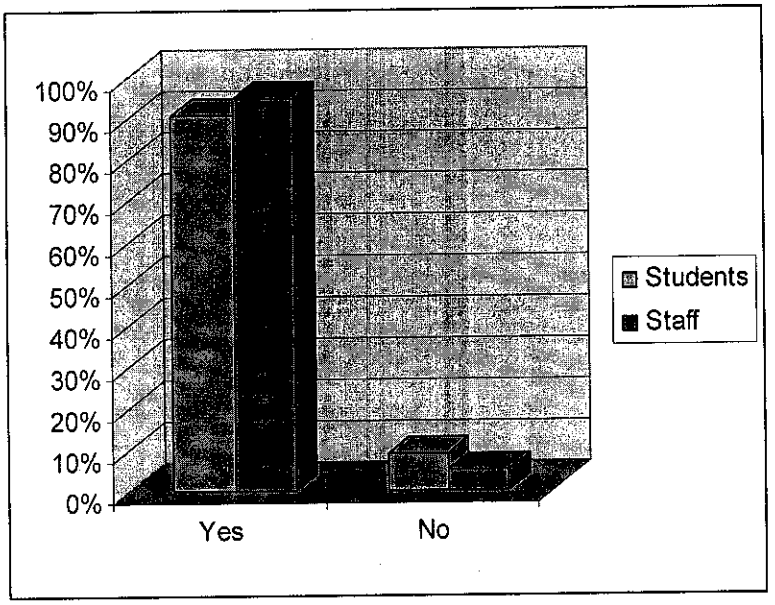
The results in Figure 4.2 lead to the result in Figure 4.3. Due to the dissatisfaction with the current system, majority of the student agreed with the implementation of Automated Vehicle Security and Registration System. So, it can be concluded that is worth to develop the proposed system, as there is no resistance to change from the students. Besides that, the system wills fully utilized technology available in the UTP such as the LAN.

4.3 Result of Finding- Questionnaires Regarding the Feasibilities, Flexibility and Reliability of Automated Vehicle Security and Registration System.

Based on the research and analysis done on data collection through the distribution of the second questionnaire, a few results had been obtained. The questionnaire have been distributed to 100 UTP students ranking from 1st year students to 5th students, and 20 UTP staff ranking from lectures, executives, and Security Department staff. The result and analysis are explained below:

4.2.1 Feasibilities Factor Satisfied For The Automated Vehicle Security and Registration System.

Data Gathered:



	Yes	No
Students	90%	10%
Staff	95%	5%

Figure 4.4

Discussion:

From the Figure 4.4, it seems that 90% from 100 students who participated in the questionnaires agreed that the online system proposed would improve the Security Department efficiency, while 10% disagreed. 95% from staffs agreed that the Department would be more efficient with the implementation of the online system. However, 5% of them disagreed.

Those who disagreed that the online system will increase efficiency believe that it is not the system alone that determines the level of efficiency. Efficient staffs are another factor that determines whether an organization (for this project, the Security Department) is efficient or not.

Data Rationale:

The result shows that more than three-quarter of the staffs and students believe that with the implementation of the new system, the Security Department increase its efficiency. Efficiency here refers to the tasks in the department that are accomplished without error and on time. To increase the efficiency, the new system must be technically feasibilities.

The online system is very technically feasible for new reason. First, the project scope is relatively small. The basic data (manual data) and processes (manual processes) for the system are readily available. It just that the data and processes need to be refined and transformed into online system.

Besides that, the requirements for this project are easily obtained and in structured form which make the online system less risky. This is because when a system fulfills business specification and user requirements, it will be very usable and highly accepted by users.

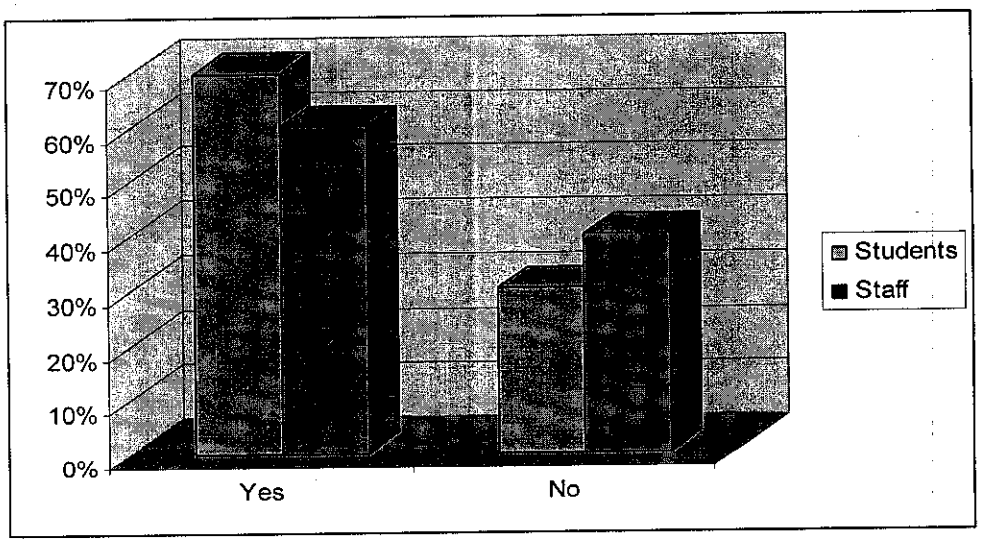
In addition, the system proposed employ commonly used or stand technology such as pc and LAN, which are available in UTP environment. This project is also less risky as the user groups are familiar with pc and web-based application.

As a conclusion, the online system should be developed, as it satisfies technical aspect of the development. Furthermore, with the development of the online system, the efficiency of task undertaken in Security Department will increase.

4.2.2 Reliability Concerns For The automated Vehicle Security and Registration System

Data Gathered:

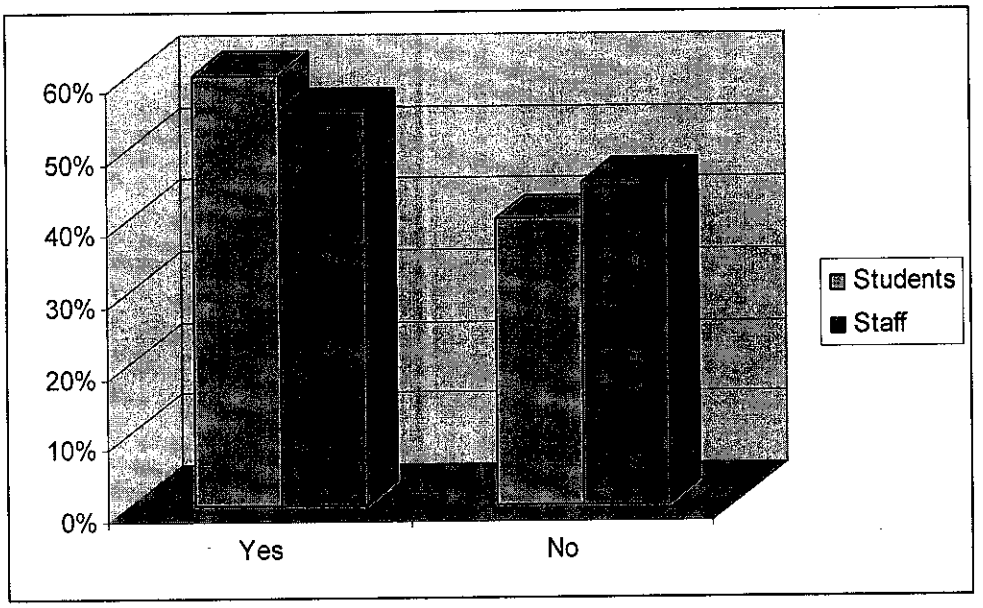
Can The Respondent Trust the System In Term of Data Confidentiality



	Yes	No
Students	70%	30%
Staff	60%	40%

Figure 4.5

Respondents Opinion on Whether the AVSR System should Integrate with Other System n UTP



	Yes	No
Students	60%	40%
Staff	55%	45%

Figure 4.6

Discussion:

Figure 4.5 show that 70% of the students and 60 % of staffs trust the online system in term of data confidentiality. Less than half of them distrust the online system. To be more precise, 30% and 40% of students and staffs respectively distrust the proposed system.

From Figure 4.6, it seems that 60% of the students think that the system should be integrate to other systems in UTP. 40 % of them believe that it should be separated from other systems in UTP. However, 55% of the staffs believe that proposed system should be isolate from all other system in UTP. Only 45% of the staffs considered that the system should be integrated to other systems.

Data Rationale:

From the questionnaire distributed, majority of students and staffs trust the online system in tern of data confidentiality. In their opinion, they believe that the developer will include all the security concerns in the system. For example, the administrator must login before they can access the system. The user only can register and view all the information in the system. Besides that, the current system data also can be access by every staff in the Security Department without restriction. Yet, until this moment, there is no case involving misuse of data is caught.

Nevertheless, there are more than quarters of there students and staff think that the online system is not reliable. They believe that even with all sort of security concern, there are ways that people can use to access the online system whether it on the Intranet or Internet based.

Due to reliability concern, majority of the staff and half of the students suggest that the online system should not be integrated with other system in UTP. This is because if the user can update their through the new system, it is worried that they will update their data as they like. This will lead to the problems where the data cannot be relied on. They have suggested that the online system used a replication of HEP database. In addition, the recommend that the online system should integrate to the Finance department as the sticker application process involve this department.

Apart from that, there are staffs and students who suggest that the system should be integrated with other system in UTP especially with the one in HEP, Finance, and Academic Central Service (ACS). Rationally, the Security Department should kept students' records similar to the HEP so that the data can be trusted on. For that reason, it is better for the online system to use the data HEP database to avoid redundancy. Besides that, the proposed system should be integrated to ACS for the disciplinary purposes. The Security Department can cooperate with the lectures in reducing the student's discipline

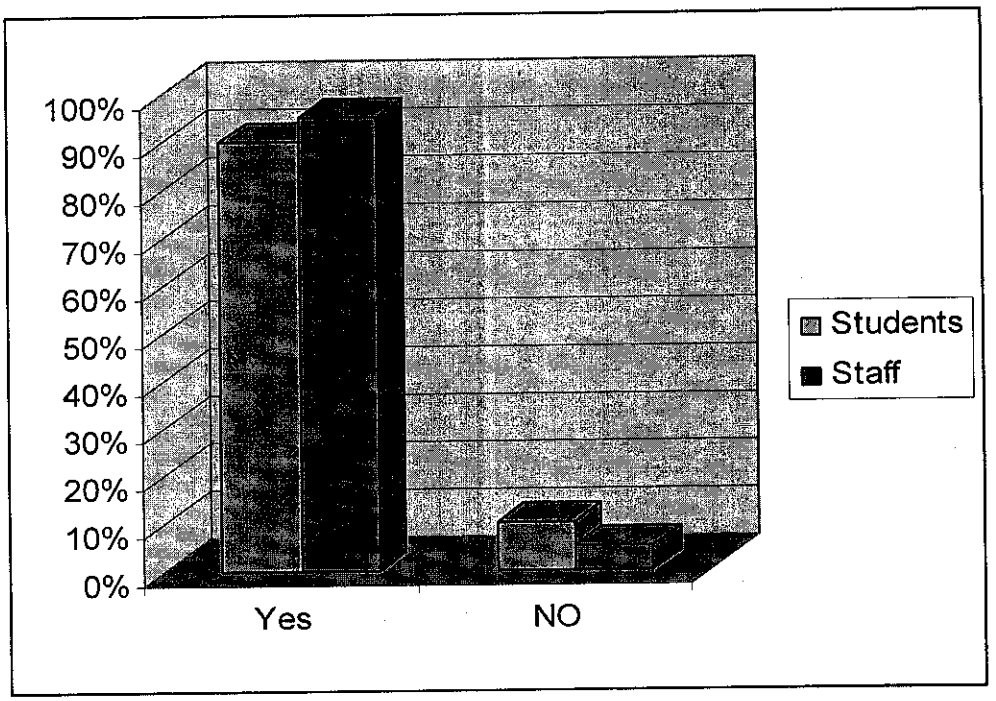
cases. Finally the integration with Finance Department system is required as some of the process involved payment that must be made at the Finance Department.

From the result obtained, it can be concluded that the system is reliable and should be implemented. Additionally, it should not be integrated with other system in UTP due to the data reliability concerns.

4.2.3 Flexibility of the Automated Vehicle Security and Registration System

Data Gathered:

Accessibilities of the UTP Security Department Online System



	Yes	No
Students	90%	10%
Staff	95%	5%

Figure 4.7

Discussion:

Figure 4.8 show that 90% from 100students and 95% from 20 staffs think that it is more convenience to access the online system compare to the existing system. While the other 10% of students and 5% of staffs believe that it wills just the same as the manual system.

Data Rationale:

From the result, most of the staffs and students that involved in this survey believe that they will fell more convenient using online system compare to the existing system. This is because the system is very flexible that hey can access to it from lab, hostel or any department. However, staffs and students that say the system is not really easy to be access have their own reason for that.

More students assume that the online system will be the same as the existing system, which difficult to be approach compare to the staffs. This is due to the reason that the students' connections to the LAN are slow compare to staffs. In addition, the proxy server allocated at the hostel server room had been down for few times. Besides that, a small percentage of staffs that think the online system will give the same performance similar to the manual system, believe that no matter how flexible the system is but if the Security Department staffs still consume longer time to complete their task, then it is better for everyone to use the current system as there is no improvement.

From the observation made by the author, currently the LAN connection at the hostel is still slow but faster than before. Besides that, the connection is quite stable as within this one and half month the servers operate well without any error. From all the result gained, it can be concluded that this online system is flexible and should be implemented by Security Department.

4.3 Result of Finding- Interview Conducted With Security Department

From the interview conducted on 5 March 2004 with the UTP Security Department Manager and Executive, which is Major Elias B. Hj. Nasir and Mr. Lakhbir B. Sardar respectively, a few results have been obtained. After explaining the functionality of the system, both of them agreed to implement it.

Based on his staff experiences, the existing system is not feasible. A lot of problems have been faced with the practice of the current system, which is the manual system. Problems such as difficulty in searching and retrieving of information as well as missing files are believed can be overcome with the implementation of the proposed system.

In addition, Mr. Lakhbir wants to secure system where everyone in UTP especially his staff can rely on to replace the current system, which was not. Even though there is no case such as misuse of data happen with the practice of the existing manual system, yet he wants a reliable system where there is no possibility of unauthorized access to be implemented. This is to ensure the trustworthiness of the new system so that all users do not hesitate to provide necessary information require by the new system.

During the interview, both Major Elias and Mr. Lakhbir have been explained in details about the proposed system. They agreed with the LAN based system because it will be easier for their staff to access to the system. For instance, when their staff issue compound at he new building, he can enter the compound information immediately. This is because the access to the system immediately by using the computer in Programming Lab 1, Multimedia Lab 1&2 or Virtual Reality Lab. This show that the system proposed in flexible.

4.4 Result of Feasibilities Study

From the study conducted, most users want the system to be practical and usable. For this project, four categories of feasibilities are studied. They are the economic, technical, operational and schedule.

4.4.1 Technical Feasibility

In terms of technical categories, this project is very feasible. This system does not require any additional hardware. This is because hardware such as personal computer and server, those are required for this system, available in Universiti Teknologi Petronas. Besides that, the project problem statement and objectives are kept small to ensure that it does not diverse from the project scope. Due to its small scope and easily obtain requirement (highly structure), this project should be viewed as having very low risk.

4.4.2 Economic Feasibilities

In terms of economy categories, this project is very feasible. It does not re quire budget for hardware as one of the startup cost. Only a few costs are required such as the one listed below:

	Costs (RM)
Development Costs	10,000.00
New software: • Server software • 1 Macintosh Server	1,500.00 8,500.00
User training	1,500
Total	21,500.00

Figure 4.9 Startup Cost

This total startup cost is affordable and worthwhile compare to benefits that will be gain from its implementation. Some of the benefits are

- more proper document management
- reduce time to search for a document
- eliminate space consuming problems
- make user of current technologies facilities available in UTP
- increase efficiency and effectiveness of the Security Department

4.4.3 Operational Feasibilities

Thus system is also operational feasible. At the moment, only user testing for the students has been conducted. From the students' feedback, its can be concluded that the system operates correspond with its business function defined. However only few design of the interface have been comments. From the user feedback, another development team member who concentrates more on the Human Computer Interaction factor has redesigned the interface.

4.4.4 Schedule Feasibility

The system covers only a small scope such as the one stated in the problem statement. This system is 90% complete. The other 10 percent is the system testing and error fixing. Due to the current system progress, this prototype is believed to be in the delivery stage in one to two times.

4.5 Result of Flexibility Study

In order to develop a system that is flexible as required by users, the developer agreed to utilize the available UTP LAN. The system used LAN instead of the Internet because to the former performance is better compare to the later. Besides that, because the system is developed for the UTP members, it will be more secure to be implemented using LAN.

4.6 Result of Reliability Study

Reliability study concerns with the trustworthy of this system. From the study conducted, users will used the system when they trust it. The system security is designed based on the objective. They are the secrecy, integrity and availabilities.

- **Secrecy:** Information should not be disclosed to unauthorized user. For example, a student should not be allowed to examine other students' summon status.
- **Integrity:** Only authorized users should be allowed to modify data. For example, student may be allowed to see their compound or summon status, yet not allowed to modify them.
- **Availability:** Authorized user should not be denied access. For example, an authorized Security Department Staff who wish to update the compound or summon status should be allowed to do so.

4.6.1 Integrity Control

Integrity control applied will protect this system from unauthorized use and update. This securities feature will include conditions that match the business function of the system. The integrity control is applied at the login page:

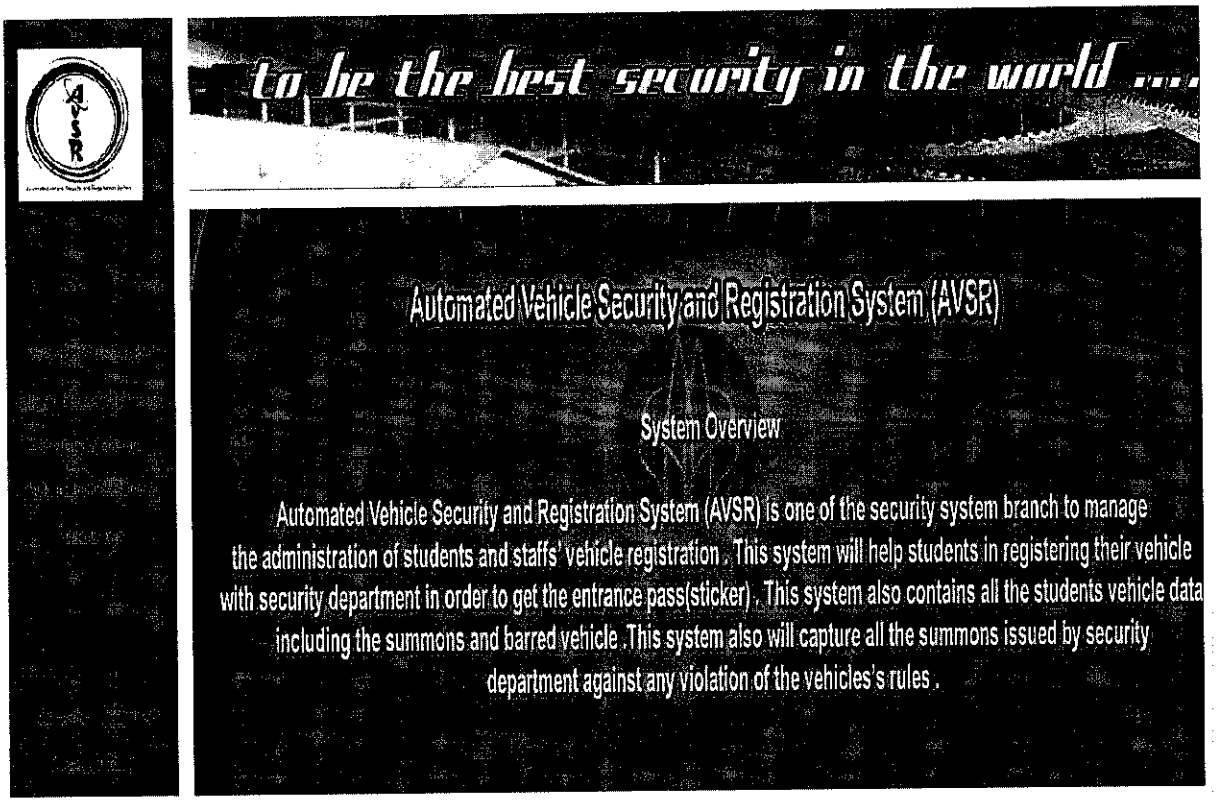


Figure 4.10 Main Menus for Admin

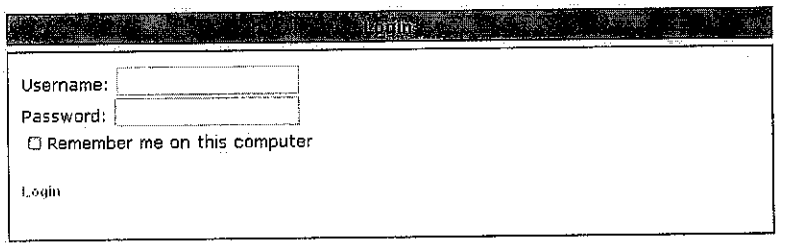


Figure 4.11 Login Page

The administrator enters his username and password, and click submits at the login button. The login phase is shown in ***Figure 4.11***. If he is unauthorized user where the username is not match with any in the database, the system will prompt an error message such as the one show in ***Figure 4.12.***

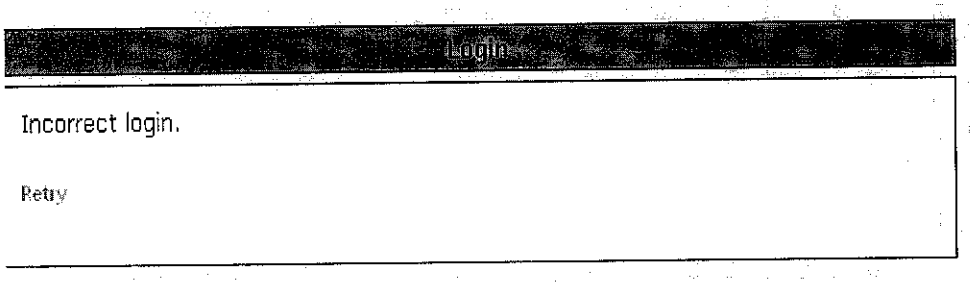


Figure 4.12 Error Message: invalid Login

4.7 Risk Management

To make sure the project flow and validity of the deliverables, the project will imply on certain risk management aspect that is done throughout the project development. These include identifying risk, managing risk and controlling risk.

Risk identification involves specifying risk based on dependency of task on other task deliverable. This is done by identifying the critical path of the project schedule as stated in the project schedule.

To manage risk that have been identified, the project has implemented a contingency plan to include half day on top of the estimated task time. This is applicable since that the time allocated for every task as based on resource capability and agreed beforehand.

To control the risk of every task especially in the critical path, a project tracking mechanism is implemented to make sure that the task on schedule and will not exceed its contingency plan time frame.

Another risk control mechanism is to allocate time allow amendment to be done to task deliverable before any task that is dependent on the deliverable is carried out.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Although the system is developed within a small scope, yet it really benefits many parties. Some of the benefits are space saving, time saving, easy searching and retrieving of data and information, labor saving, cost displacement and value-added as mentioned in the problem statement section. In addition, the department can train its staff in using a computerized system. So that the staff would not have much problem when they required to use a more sophisticated system when moving to the new building.

The information gains from research conducted are used in deciding whether the system is worth to be developed. Furthermore, at this project involves a small scope, it is feasible to be completed within two and three months period. As s conclusion, this project is worth to be developed and implemented as many processes become efficient with its implementation.

5.2 Automated Vehicle Security and Registration System Advantage

The benefits of Automated Vehicle Security and Registration System are listed below:

5.2.1 Minimized Misunderstanding between Security Department and Student

Student and Security Department can check for any outstanding issued summon online for further action if summon issued not received by the driver (student)., i.e., student can resolve out their summons before getting blacklisted by the department and vice versa.

5.2.2 Easy to Use

Step-by-step wizards simplify the process of making and changing of registration. This system provided more systematic approach which can easily learn and understand by user. It also provide easier procedure to the both applicant and the security department.

5.2.3 Increases Productivity

It reduces the time required to fill out applicant form where they can get form the security department. Student can register and update their vehicle information online thus need to fulfill out the forms. The system also is designed for vehicle registration and administration by the security Department and while at the same time for student to register their vehicle.

5.2.4 Improves Communication

It improves communication between Organization Security Department and drivers, especially student.

5.3 Recommendations

In order to ensure the Automated Vehicle Security and Registration System developed achieve its objective, some recommendations have been made. This will help the future enhancement of the system.

Besides that, some discussion and recommendation also have been made to the UNIVERSITI TEKNOLOGI PETRONAS (UTP). This is for the advantage of future UTP student who will be doing the Final Year Project.

5.3.1 Recommendation On The System

Enhance the security of Automated Vehicle Security and Registration System

As the developer for the system, it is believed that the system securities need to be enhanced. For this system, two major security concerns are taken into consideration. First is the authorization in accessing the system. The administrator need to login to the system using their username and password. Second is the session hold by the system. If one tries to change the session, the system will direct him to be login.

Both securities used for the system do not guaranty the system from any bugs or holes. For this system a personal computer has been used as a server. This pc does not have firewall such as the one UTP server has. It is believed that when the system is integrated with UTP server, it will be more secure. Beside that, the developer can enhance this system security with the use of coding that cannot be view by users such as '*.Asp'. It is difficult for someone to hack the system, which it coding cannot be seen.

Reduce Data Redundancy

For this system, table in the database are created and linked using the relational method. Tables that are linked to each other must have foreign key. Due to this reason, data redundancy problem has been encountered. This problem can be overcome by using the object-oriented approach in developing the database.

Even though the object-oriented approach is more difficult and complex compare to the relational approach yet it can be support flexible type declaration as the supported by most programming language and uniquely identified object attributes. In addition, it also supports the reuse of information by referencing object from different location and allow inheritance.

5.3.2 Recommendation to Universiti Teknologi Petronas

Increase credit hours for Final Year Project

In my opinion, the three credit hours allocated for the Information Technology /System Final Year project (FYP) should be increase to either four or five .This because three credit hours allocated for the FYP is not worth compared to the high workload. This is will be unfair especially for those students who have give full commitments in carrying out their FYP.

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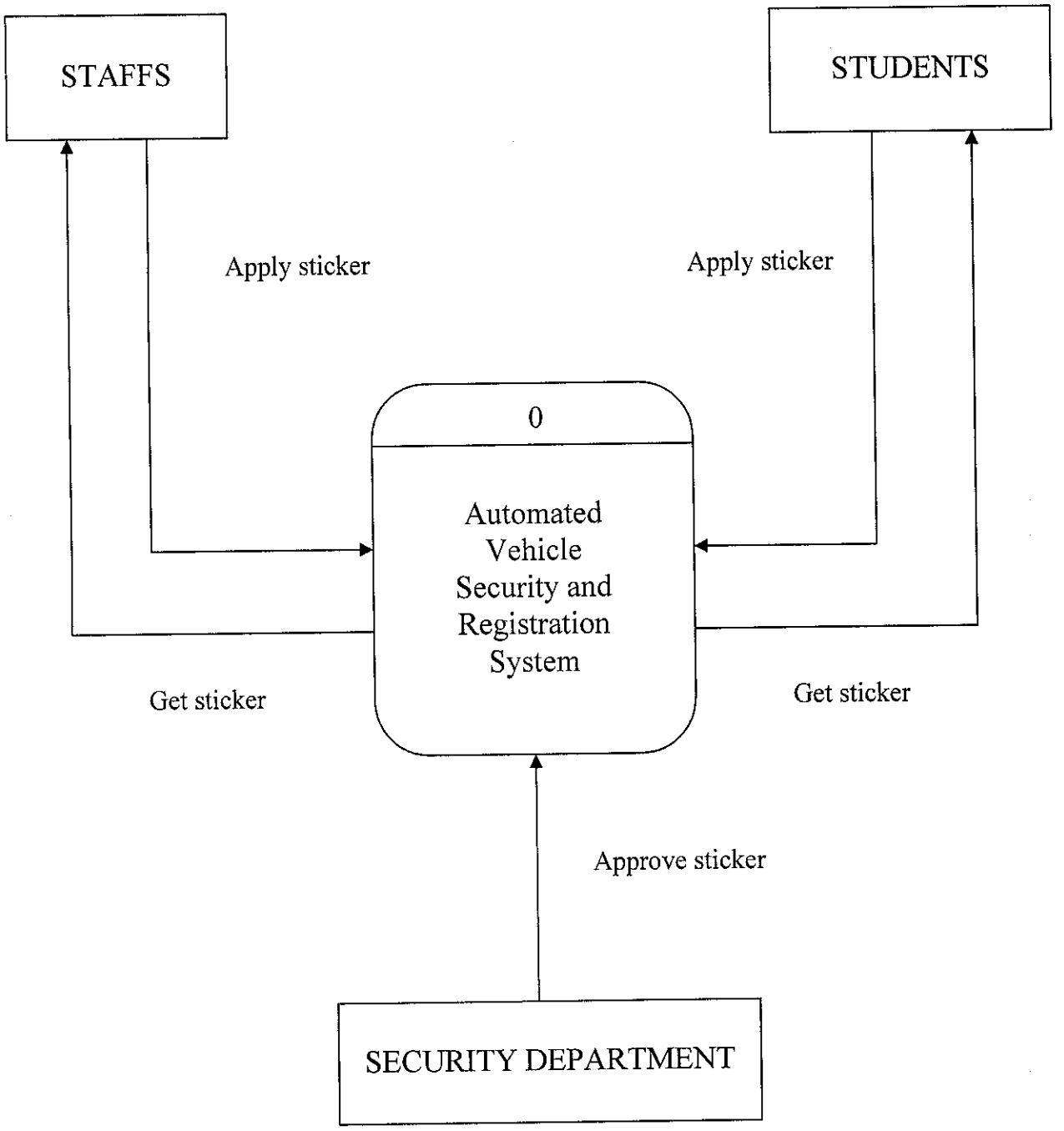
Appendices

Appendix 1

Data Flow Diagram

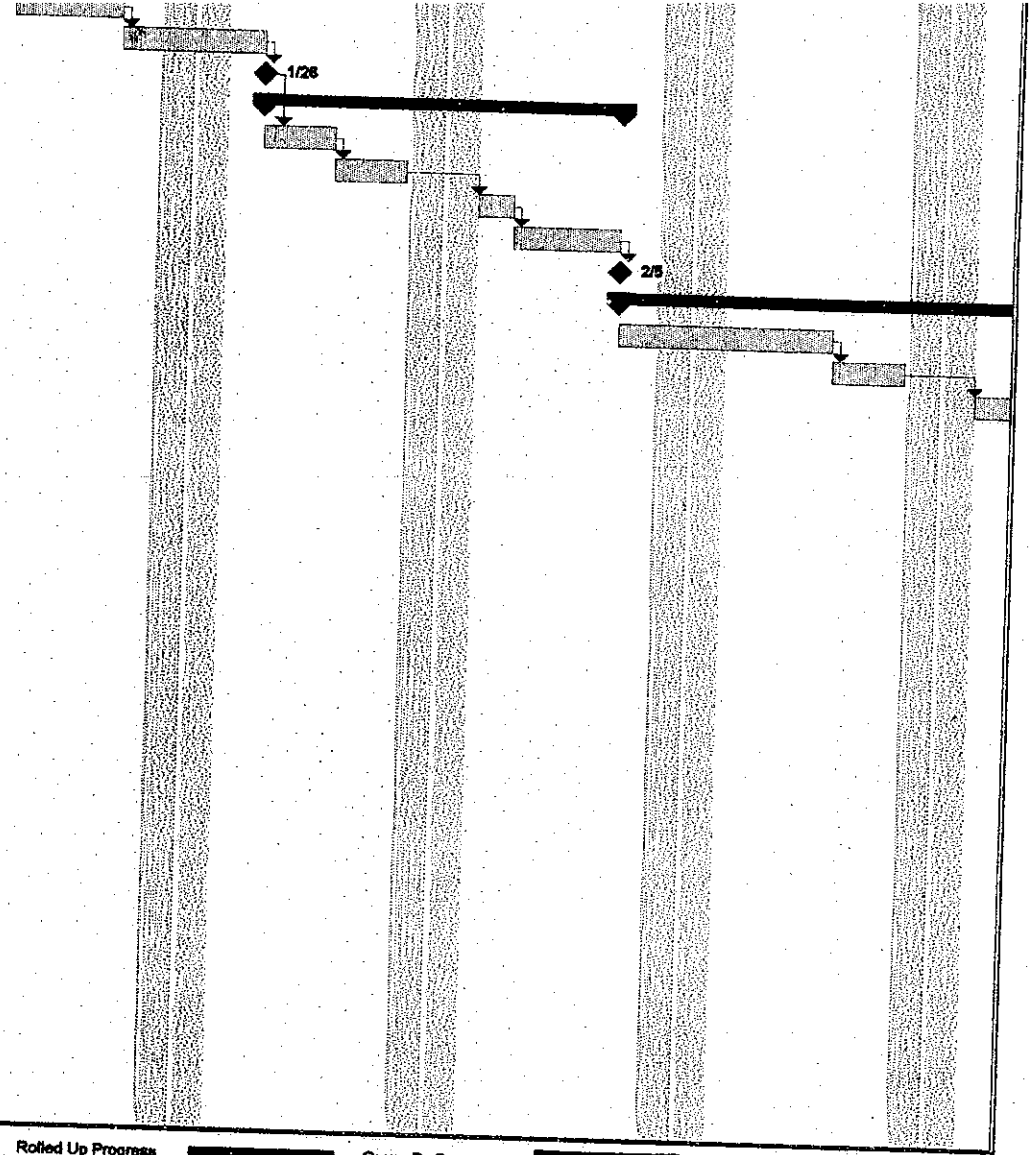
1.1 Context Level



Appendix 2

Gantt Chart

	Task Name	Duration	Start	Finish
5	Feasibility Study	2 days	Fri 1/23/04	Mon 1/26/04
6	Project Scope Complete	0 days	Mon 1/26/04	Mon 1/26/04
7	Analysis	8 days	Tue 1/27/04	Thu 2/5/04
8	Requirement Gathering	2 days	Tue 1/27/04	Wed 1/28/04
9	Analysis	2 days	Thu 1/29/04	Fri 1/30/04
10	Requirement Review	1 day	Mon 2/2/04	Mon 2/2/04
11	Architecture Design	3 days	Tue 2/3/04	Thu 2/5/04
12	Final Project Plan and Schedule	0 days	Thu 2/5/04	Thu 2/5/04
13	Design	29 days	Fri 2/6/04	Wed 3/17/04
14	Instrastructure Component Design	4 days	Fri 2/6/04	Wed 2/11/04
15	System Interaction Process Flow	2 days	Thu 2/12/04	Fri 2/13/04
16	Interface Design	4 days	Mon 2/16/04	Thu 2/19/04
17	Database Structure	3 days	Fri 2/20/04	Tue 2/24/04
18	Design Review	1 day	Wed 2/25/04	Wed 2/25/04
19	Web Programming	4 days	Thu 2/26/04	Tue 3/2/04
20	Administrative Function	2 days	Wed 3/3/04	Thu 3/4/04
21	Security	2 days	Fri 3/5/04	Mon 3/8/04
22	Automated Email	2 days	Tue 3/9/04	Wed 3/10/04
23	Input Validation and Verification Function	3 days	Thu 3/11/04	Mon 3/15/04
24	Design Review	1 day	Tue 3/16/04	Tue 3/16/04
25	Amendment	1 day	Wed 3/17/04	Wed 3/17/04
26	Finish Module Development	0 days	Wed 3/17/04	Wed 3/17/04
27	User Acceptance Testing	12 days	Thu 3/18/04	Fri 4/2/04
28	Web Module Testing	2 days	Thu 3/18/04	Fri 3/19/04
29	Administrative Function Module Testing	2 days	Mon 3/22/04	Tue 3/23/04
30	SecurityFunction Module Testing	2 days	Wed 3/24/04	Thu 3/25/04
31	Automated Email Module	1 day	Fri 3/26/04	Fri 3/26/04
32	Input Validation and Verification Function M	2 days	Mon 3/29/04	Tue 3/30/04
33	Integrated System Testing	2 days	Wed 3/31/04	Thu 4/1/04
34	Amendment	1 day	Fri 4/2/04	Fri 4/2/04
35	Working Application	0 days	Fri 4/2/04	Fri 4/2/04
36	Submission of Project's Final Draft	3 days	Tue 3/30/04	Thu 4/1/04
37	Submission of Project's Final Draft	2 days	Fri 4/9/04	Mon 4/12/04
38	Oral Presentation	6 days	Tue 4/27/04	Tue 5/4/04
39	Submission of Project Dissertation	4 days	Tue 6/1/04	Fri 6/4/04



Project: sver
Date: Sun 4/18/04

Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary

	Task Name	Duration	Start	Finish
5	Feasibility Study	2 days	Fri 1/23/04	Mon 1/26/04
6	Project Scope Complete	0 days	Mon 1/26/04	Mon 1/26/04
7	Analysis	8 days	Tue 1/27/04	Thu 2/5/04
8	Requirement Gathering	2 days	Tue 1/27/04	Wed 1/28/04
9	Analysis	2 days	Thu 1/29/04	Fri 1/30/04
10	Requirement Review	1 day	Mon 2/2/04	Mon 2/2/04
11	Architecture Design	3 days	Tue 2/3/04	Thu 2/5/04
12	Final Project Plan and Schedule	0 days	Thu 2/5/04	Thu 2/5/04
13	Design	29 days	Fri 2/6/04	Wed 3/17/04
14	Insfrastructure Component Design	4 days	Fri 2/6/04	Wed 2/11/04
15	System Interaction Process Flow	2 days	Thu 2/12/04	Fri 2/13/04
16	Interface Design	4 days	Mon 2/16/04	Thu 2/19/04
17	Database Structure	3 days	Fri 2/20/04	Tue 2/24/04
18	Design Review	1 day	Wed 2/25/04	Wed 2/25/04
19	Web Programming	4 days	Thu 2/26/04	Tue 3/2/04
20	Administrative Function	2 days	Wed 3/3/04	Thu 3/4/04
21	Security	2 days	Fri 3/5/04	Mon 3/8/04
22	Automated Email	2 days	Tue 3/9/04	Wed 3/10/04
23	Input Validation and Verification Function	3 days	Thu 3/11/04	Mon 3/15/04
24	Design Review	1 day	Tue 3/16/04	Tue 3/16/04
25	Amendment	1 day	Wed 3/17/04	Wed 3/17/04
26	Finish Module Development	0 days	Wed 3/17/04	Wed 3/17/04
27	User Acceptance Testing	12 days	Thu 3/18/04	Fri 4/2/04
28	Web Module Testing	2 days	Thu 3/18/04	Fri 3/19/04
29	Administrative Function Module Testing	2 days	Mon 3/22/04	Tue 3/23/04
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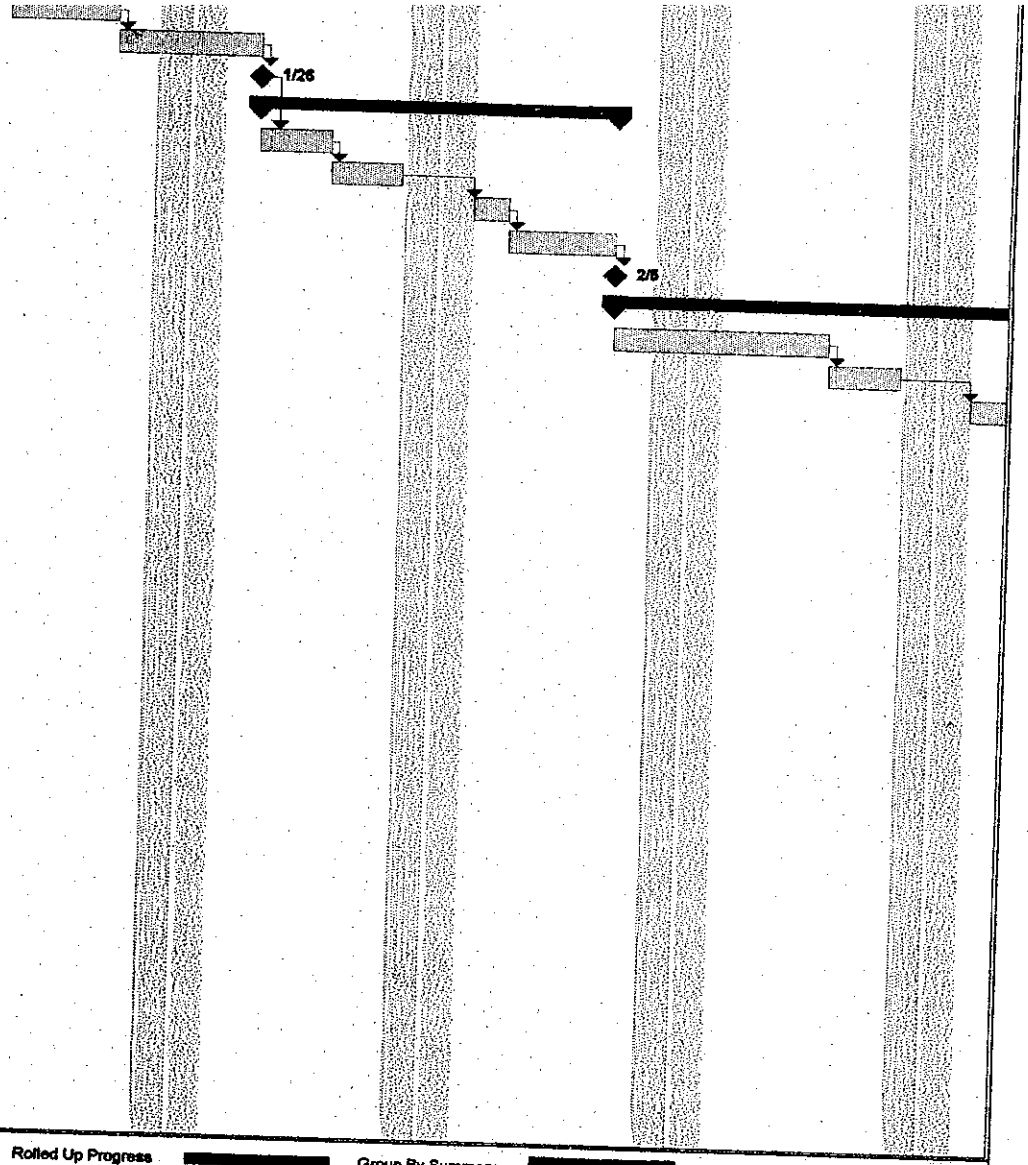
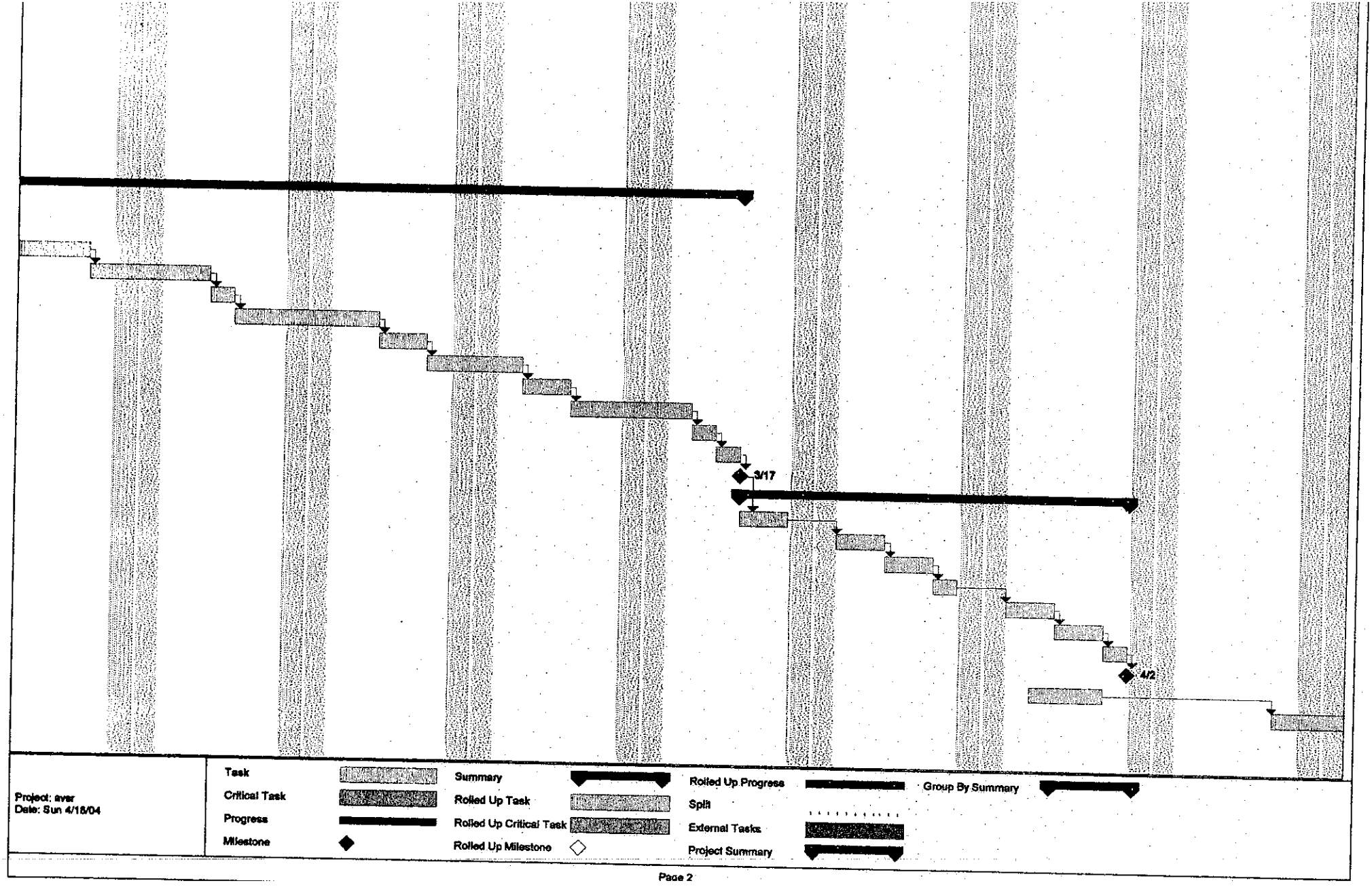
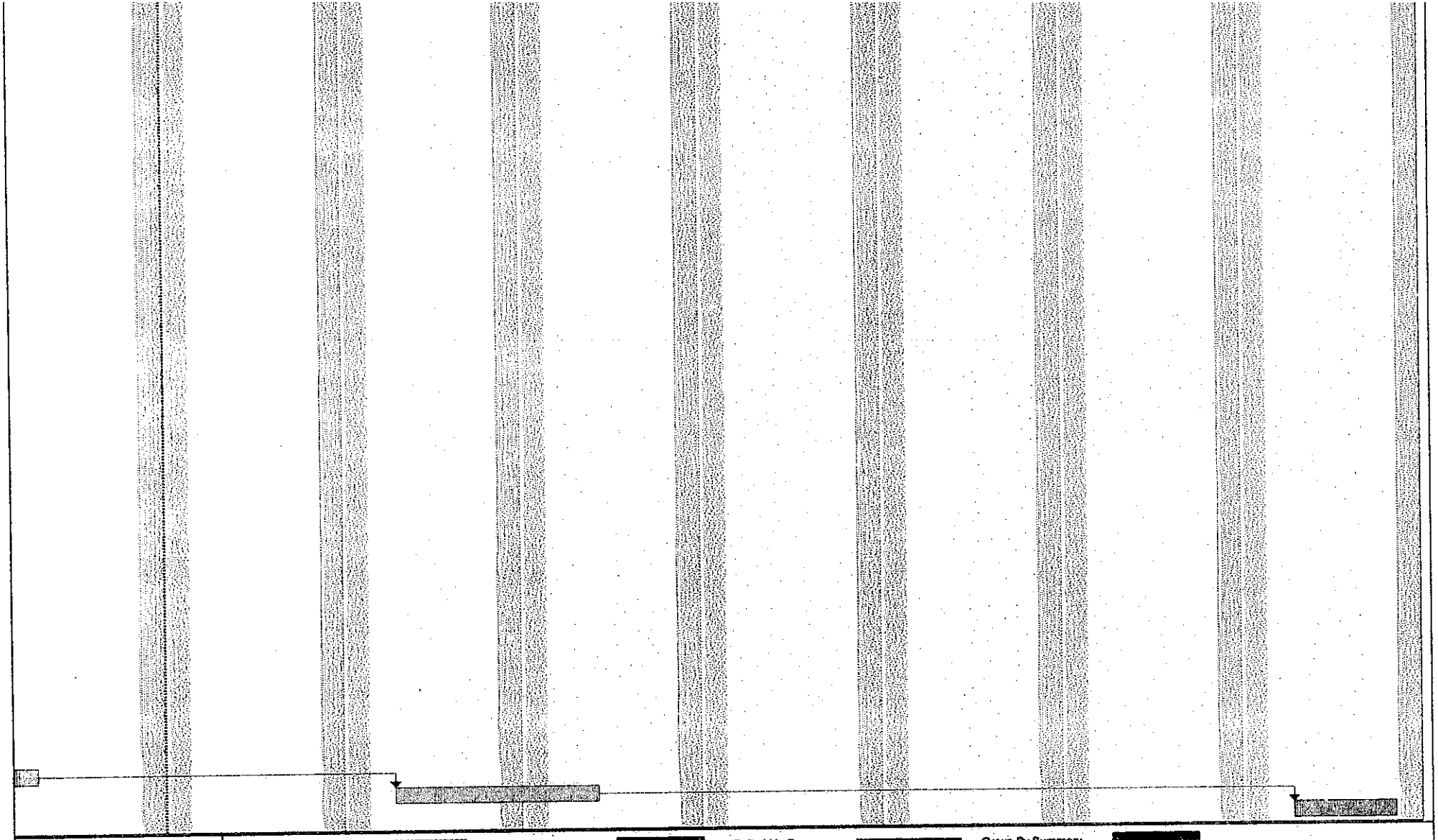
31	Automated Email Module	1 day	Fri 3/26/04	Fri 3/26/04
32	Input Validation and Verification Function M	2 days	Mon 3/29/04	Tue 3/30/04
33	Integrated System Testing	2 days	Wed 3/31/04	Thu 4/1/04
34	Amendment	1 day	Fri 4/2/04	Fri 4/2/04
35	Working Application	0 days	Fri 4/2/04	Fri 4/2/04
36	Submission of Project's Final Draft	3 days	Tue 3/30/04	Thu 4/1/04
37	Submission of Project's Final Draft	2 days	Fri 4/9/04	Mon 4/12/04
38	Oral Presentation	6 days	Tue 4/27/04	Tue 5/4/04
39	Submission of Project Dissertation	4 days	Tue 6/1/04	Fri 6/4/04



Project: aver
Date: Sun 4/18/04

Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary


3/17
4/2
Project: aver
Date: Sun 4/18/04
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary



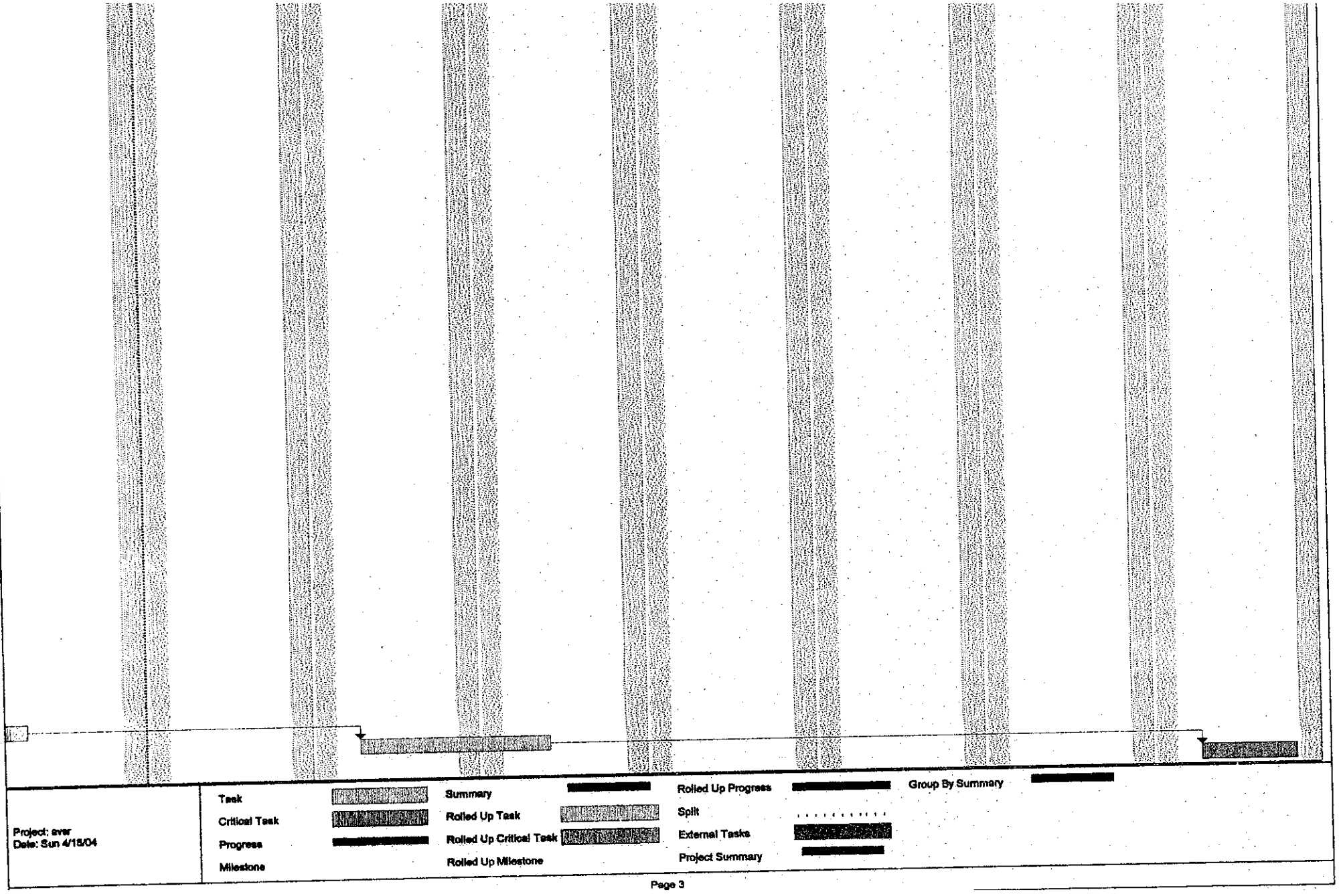
Project: svsr
Date: Sun 4/18/04

Task
Critical Task
Progress
Milestone

Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone

Rolled Up Progress
Split
External Tasks
Project Summary

Group By Summary


Project: aver
Date: Sun 4/18/04
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary

Appendix 3

Questionnaire 1

I am a Final Year IT student, doing my Final Year Project. This questionnaire is to help me in getting some responds towards the acceptance of **Automated Vehicle Security and Registration System (AVSR System)** for the Security Department and the student or staff at UTP. Please take a moment to fill in the questionnaire. Thank you.

1.) Do you have any car or bike here in UTP?

f) Yes
g) No

If yes please go to the next question, if No please go to question 4

2.) Have you apply the sticker for the vehicle?

f) Yes
g) No

If yes please go to the next question, if No please go to question 4

3.) Do you face any of the following problems in applying sticker?

☐ No problem

☐ Missing application form

☐ The process is too long as it suppose to

☐ Other, please specify:.....
.....

4.) Do you think that new system will help to improve the Security Department efficiency? Why?

g) Yes
h) No
i)

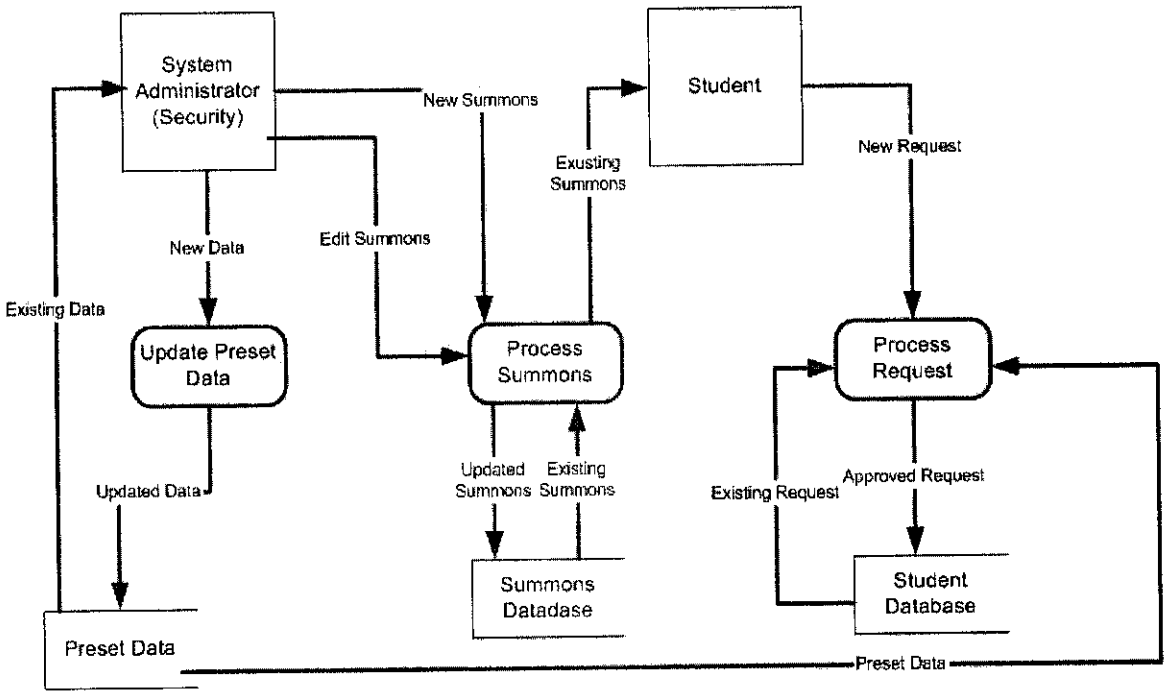
Reason:.....
.....

5.) Can you trust the system in term of confidentiality, when it requires your personal data?

a) Yes
b) No

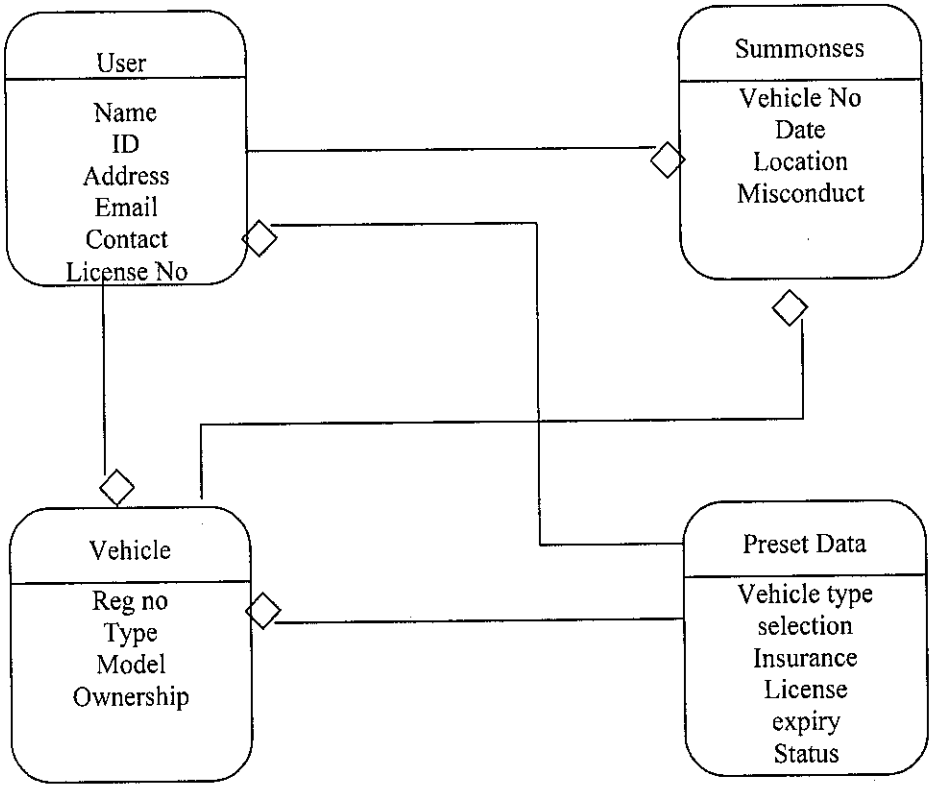
Appendix 4

Data Flow Diagram


System Administrator (Security)
New Summons
Student
New Request
Exusting Summons
New Data
Edit Summons
Existing Data
Update Preset Data
Process Summons
Process Request
Updated Summons
Existing Summons
Updated Data
Existing Request
Approved Request
Summons Datadase
Student Database
Preset Data
Preset Data

Appendix 5

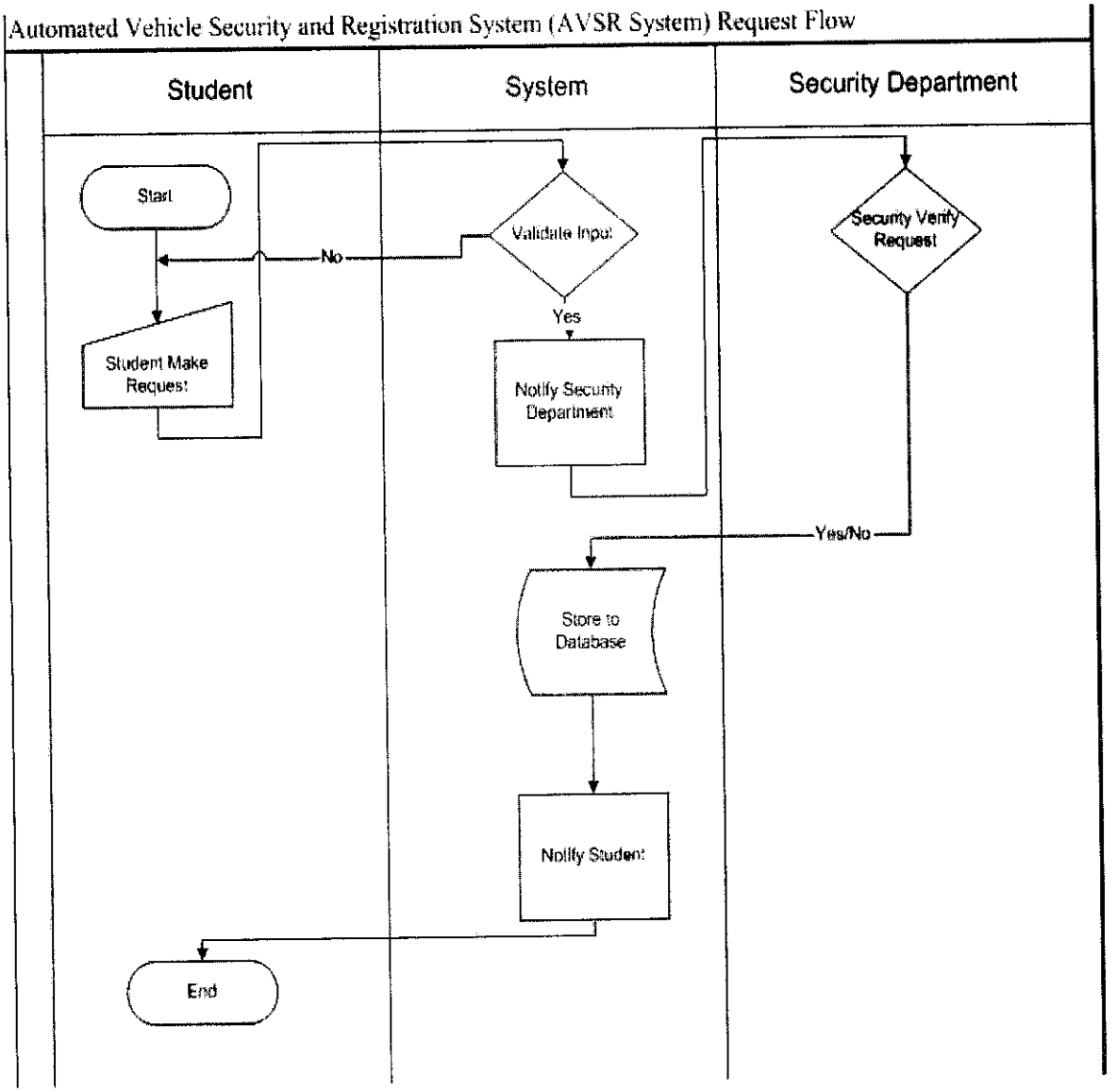
Database Structure



Database Structure

Appendix 6

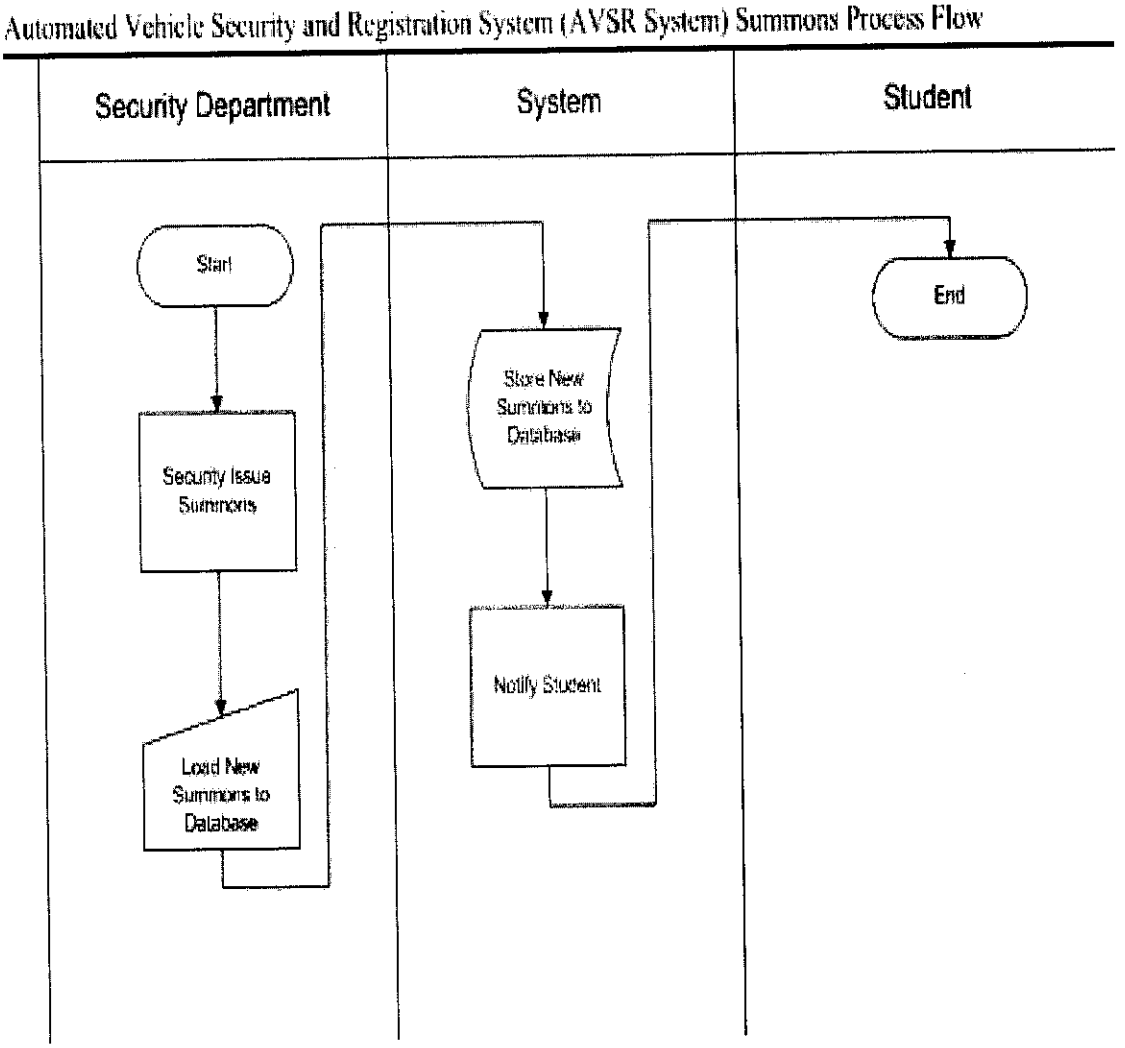
Request Flow Diagram



Request Flow Diagrams

Appendix 7

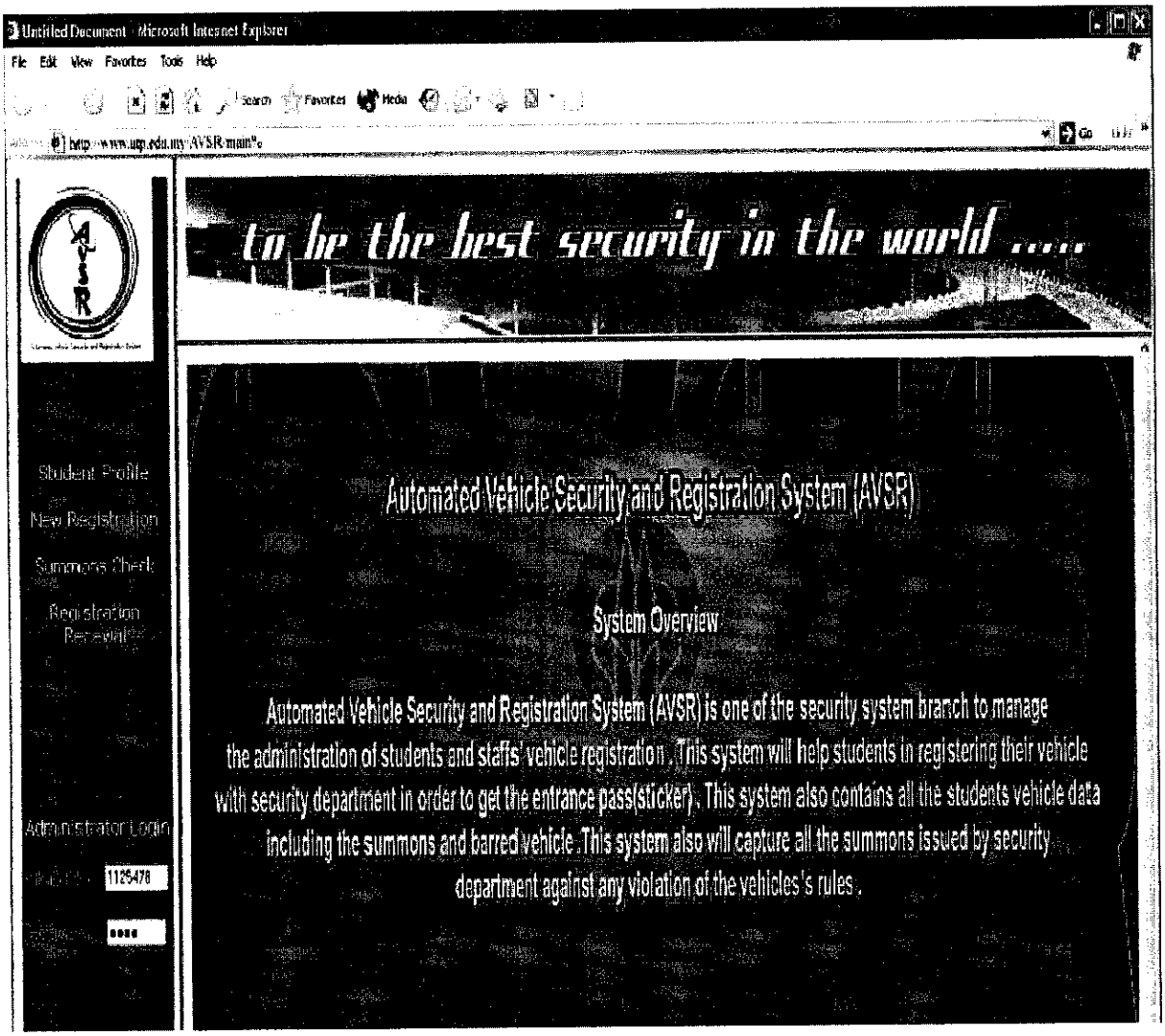
Summon Process Flow



Summon Process Flow

Appendix 9

Main Menu for Admin



Main Menu for Admin

Appendix 10

Interview Questions

Interview Guidelines

1. Describing all task handles by UTP Security Department
2. Explaining the processes /procedures of each task.
3. Problem faced with existing (manual) system.
4. Do you prefer a computerized system?
5. Future plan of the department, concerning with the security issues in UTP.
6. If the proposed system is well implemented, will you consider using it?
7. If one day, the department has changed to the online system, who will develop the system? Internal staff or consultant
8. Do the staffs need some formal training before they use the future system?
9. Your view regarding the system suggested
10. Comments on the proposed system.
11. Suggestion on the proposed.

Appendix 11

Questionnaire 2

QUESTIONNAIRE:

I am a Final Year IT student, doing my Final Year Project. This questionnaire is to help me in getting some responds towards the acceptance of **Automated Vehicle Security and Registration System (AVSR System)** for the Security Department and the student or staff at UTP specifically for the administration of students or staffs' vehicle management. Please take a moment to fill in the questionnaire. Thank you.

1) Are there too many process involved in the existing vehicle registration system?

   a) Extremely many
   b) Many
   c) Just Nice
   d) Not that many
   e) Not at all

2) How many days usually taken to complete the registration process?

   a) Below 1 day
   b) 2 days
   c) 3 days
   d) 4 days
   e) 5 days and above

3) Would this circumstance give hassle to the community (students and staffs)?

   a) Definitely
   b) Almost definitely
   c) Averagely annoying
   d) Will not really annoying
   e) Absolutely not

4) Would the existing system be best replaced by an online system along with Database Management System (DBMS) to enhance the efficiency and effectiveness?

   a) Definitely
   b) Almost definitely

c) Averagely appropriate
d) Will not really appropriate
e) Absolutely not
f)

5) By applying the online system, which is the best solution to resolve the problems arise?
   a) Notification by e-mail
   b) Posted posters
   c) Phone call
   d) SMS
   e) If others, please state _____

6) What is your overall comment about the existing vehicle registration system?

_____
_____
_____
_____

7) Give your suggestion to improve the existing vehicle registration system?

_____
_____
_____
_____

8) If the current system is changed into online system, what did you expect from the new system?

_____
_____
_____
_____

Appendix 12

Sample of Security Department Sticker Application Form

NO. SIRI :_____

UNIVERSITI TEKNOLOGI PETRONAS

JABATAN KESELAMATAN
UNIVERSITI TEKNOLOGI PETRONAS

BORANG PERMOHONAN PELEKAT KENDERAAN PELAJAR

SESSI : _____

MAKLUMAT PELAJAR

ıuh :_____ ID Pelajar :_____

engenalan : _____ (Baru) _____(Lama)

ıgajian : _____ Kursus Diambil :_____ Kategori :Persendirian/Tajaan _____

ıgajian :_____ No. Telefon : _____

Memandu :_____ Lesen Memandu sah sehingga :_____

MAKLUMAT KENDERAAN

deraan: _____ No.Pendaftaran Kenderaan :_____

_____ Jenama :_____ Cukai Jalan sahlaku sehingga :_____

nilik Kenderaan :_____ Hubungan dengan pemilik:_____

:milik Kenderaan : _____

_____

Yang Perlu Dipatuhi Dari Semasa Ke Semasa :

akan mematuhi semua peraturan lalulintas seperti had kelajuan dan tempat meletak kenderaan mengikut arahan yang kan oleh pihak Universiti.

uga bersetuju untuk membayar harga pelekat Kenderaan yang ditetapkan oleh pihak Universiti mengikut sessi dan juga nya berlaku kehilangan, keciciran dan kerosakan ke atas pelekat tersebut.

uga memahami syarat-syarat yang dikenakan kepada saya adalah mengikut akta-akta Universiti yang berkaitan dengan las. Oleh itu sekiranya saya mengingkari peraturan tersebut, pihak Universiti tidak mempunyai halangan untuk mengambil an selanjutnya ke atas kesalahan saya. Saya juga tidak akan menghalang Jabatan Keselamatan untuk membatalkan unaan PAS KENDERAAN dan tidak membenarkan kenderaan saya memasuki kawasan Universiti.

_____ Tandatangan Pelajar :_____

UNTUK KELULUSAN/TINDAKAN JABATAN KESELAMATAN

_____Tarikh Pengeluaran :_____Diluluskan oleh :_____
(Cop Jabatan Keselamatan)

UNTUK PENGESAHAN PENERIMAAN

_____ Tandatangan Penerima : _____

mohonan mesti disertakan salinan Kad Pengenalan, salinan geran, salinan lesen dan juga salinan cukai jalan. Sila buat bayaran di Jabatan n untuk penyediaan Pelekat tersebut . Sekian , terima kasih.

KESELAMATAN ANDA ADALAH KEUTAMAAN JABATAN KESELAMATAN

BORANG UTP-SEC/003

STAF UTP

JABATAN KESELAMATAN
UNIVERSITI TEKNOLOGI PETRONAS

BORANG PERMOHONAN PELEKAT KENDERAAN KAKITANGAN

SESSI :

MAKLUMAT KAKITANGAN

Penuh : _____ ID Kakitangan : _____

d Pengenalan : _____(Baru) _____(Lama)

n : _____ Gred : _____ Kategori : Eksekutif/Bukan Eksekutif

n : _____ No. Telefon Pejabat : _____

en Memandu : _____ Lesen Memandu sah sehingga : _____

MAKLUMAT KENDERAAN

enderaan: _____ No.Pendaftaran Kenderaan : _____

_____ Jenama : _____ Cukai Jalan sahlaku sehingga : _____

emilik Kenderaan : _____ Hubungan dengan pemilik: _____

Pemilik Kenderaan : _____

_____

n Yang Perlu Dipatuhi Dari Semasa Ke Semasa :

a akan mematuhi semua peraturan lalulintas seperti had kelajuan dan tempat meletak kenderaan mengikut arahan yang apkan oleh pihak Universiti.

a juga bersetuju untuk membayar harga pelekat Kenderaan yang ditetapkan oleh pihak Universiti mengikut sesi dan juga anya berlaku kehilangan, keciciran dan kerosakan pelekat ke atas pelekat tersebut.

a juga memahami syarat-syarat yang dikenakan kepada saya adalah mengikut akta-akta Universiti yang berkaitan dengan ntas. Oleh itu sekiranya saya mengingkari peraturan tersebut, pihak Universiti tidak mempunyai halangan untuk mengambil kan selanjutnya ke atas kesalahan saya. Saya juga tidak akan menghalang Jabatan Keselamatan untuk membatalkan gunaan PAS KENDERAAN dan membenarkan kenderaan saya memasuki kawasan Universiti.

h permohonan : _____ Tandatangan Kakitangan : _____

UNTUK KELULUSAN DAN TINDAKAN JABATAN KESELAMATAN

_____ Tarikh Pengeluaran : _____ Diluluskan oleh : _____

UNTUK PENGESAHAN PENERIMAAN

_____ Tandatangan Pemohon _____

bayaran di Kaunter Pengurusan Kewangan sebelum menyerahkan borang ini ke Jabatan Keselamatan untuk penyediaan Pelekat tersebut .
ma kasih.

KESELAMATAN ANDA ADALAH KEUTAMAAN JABATAN KESELAMATAN

BORANG SY/TP-007

VENDOR

JABATAN KESELAMATAN
UNIVERSITI TEKNOLOGI PETRONAS

BORANG PERMOHONAN PELEKAT KENDERAAN VENDOR

SESSI : _____

MAKLUMAT PEMOHON

nuh :_____ ID Kakitangan :_____

Pengenalan : _____(Baru) _____(Lama)

_____Syarikat :_____No. Telefon : _____

Memandu :_____ Lesen Memandu sah sehingga :_____

_____

MAKLUMAT KENDERAAN

deraan: _____No.Pendaftaran Kenderaan :_____

_____ Jenama :_____ Cukai Jalan sahlaku sehingga :_____

nilik Kenderaan :_____ Hubungan dengan pemilik:_____

milik Kenderaan : _____

_____

Yang Perlu Dipatuhi Dari Semasa Ke Semasa :

kan mematuhi semua peraturan lalulintas seperti had kelajuan dan tempat meletak kenderaan mengikut arahan yang can oleh pihak Universiti.

ga bersetuju untuk membayar harga pelekat Kenderaan yang ditetapkan oleh pihak Universiti mengikut sesi dan juga ya berlaku kehilangan, keciciran dan kerosakan ke atas pelekat tersebut.

ga memahami syarat-syarat yang dikenakan kepada saya adalah mengikut akta-akta Universiti yang berkaitan dengan s. Oleh itu sekiranya saya mengingkari peraturan tersebut, pihak Universiti tidak mempunyai halangan untuk mengambil n selanjutnya ke atas kesalahan saya. Saya juga tidak akan menghalang Jabatan Keselamatan untuk membatalkan naan PAS KENDERAAN dan tidak membenarkan kenderaan saya memasuki kawasan Universiti.

_____ Tandatangan Pemohon :_____

UNTUK KELULUSAN/TINDAKAN JABATAN KESELAMATAN

_____Tarikh Pengeluaran :_____Diluluskan oleh :_____
(Cop Jabatan Keselamatan)

UNTUK PENGESAHAN PENERIMAAN

honan mesti disertakan salinan Kad Pengenalan, salinan geran, salinan lesen dan juga salinan cukai jalan. Sila buat bayaran di Kaunter wangan sebelum menyerahkan borang ini ke Jabatan Keselamatan untuk penyediaan Pelekat tersebut . Sekian , terima kasih.

KESELAMATAN ANDA ADALAH KEUTAMAAN JABATAN KESELAMATAN

BORANG SY/TP-007

VENDOR

JABATAN KESELAMATAN
UNIVERSITI TEKNOLOGI PETRONAS

BORANG PERMOHONAN PELEKAT KENDERAAN VENDOR

SESSI : _____

MAKLUMAT PEMOHON

nuh : _____ ID Kakitangan : _____

Pengenalan : _____(Baru) _____(Lama)

_____Syarikat : _____No. Telefon : _____

Memandu : _____ Lesen Memandu sah sehingga : _____

_____

MAKLUMAT KENDERAAN

deraan: _____No.Pendaftaran Kenderaan : _____

_____ Jenama : _____ Cukai Jalan sahlaku sehingga : _____

milik Kenderaan : _____ Hubungan dengan pemilik: _____

milik Kenderaan : _____

_____

Yang Perlu Dipatuhi Dari Semasa Ke Semasa :

kan mematuhi semua peraturan lalulintas seperti had kelajuan dan tempat meletak kenderaan mengikut arahan yang can oleh pihak Universiti.

ga bersetuju untuk membayar harga pelekat Kenderaan yang ditetapkan oleh pihak Universiti mengikut sessi dan juga ya berlaku kehilangan, keciciran dan kerosakan ke atas pelekat tersebut.

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_____ Tandatangan Pemohon : _____

UNTUK KELULUSAN/TINDAKAN JABATAN KESELAMATAN

_____Tarikh Pengeluaran : _____Diluluskan oleh : _____
(Cop Jabatan Keselamatan)

UNTUK PENGESAHAN PENERIMAAN

honan mesti disertakan salinan Kad Pengenalan, salinan geran, salinan lesen dan juga salinan cukai jalan. Sila buat bayaran di Kaunter rangan sebelum menyerahkan borang ini ke Jabatan Keselamatan untuk penyediaan Pelekat tersebut . Sekian , terima kasih.

KESELAMATAN ANDA ADALAH KEUTAMAAN JABATAN KESELAMATAN

Appendix 13

Sample of Security Department Summon Form

No. 2265

UNIVERSITI TEKNOLOGI PETRONAS

UNIVERSITI TEKNOLOGI PETRONAS

PEMBERITAHUAN TERHADAP KESALAHAN
DI BAWAH PERUNTUKAN YANG TERKANDUNG DI DALAM
PERATURAN TATATERTIB PELAJAR

Tarikh : 12/02/04 Masa : 0830 Tempat : V1 - B

Nama : .... No. Pelajar : ....

Kursus : .... Kolej Kediaman : ....

JENIS KESALAHAN ....
LETAK MIKAL DALAM BANGUNAN
KOLEJ KEDIAMAN
JHB 2905 1/27/3

Dengan ini adalah diberitahu bahawa anda telah melakukan kesalahan seperti yang tersebut di atas. Mengikut PERATURAN TATATERTIB PELAJAR Kesalahan ini **BOLEH / TIDAK BOLEH** dikenakan hukuman tatatertib terus. Anda dikehendaki membayar **kompaun** di Kaunter Kewangan UTP sebanyak RM 30/- .... sebelum 11/03/04

Nama :

No. Kakitangan :
b.p. Jawatankuasa Tatatertib Pelajar

Nama :

No. Pelajar:

Jika kompaun ini tidak dijelaskan pada tarikh tersebut, mengikut Garispanduan Tatatertib Universiti Teknologi PETRONAS, 1998, tindakan tatatertib yang **lebih tegas** akan diambil.

Salah information oleh Pengawal.

Dana & Kewangan

No. 3354

UNIVERSITI TEKNOLOGI PETRONAS

JABATAN KESELAMATAN
UNIVERSITI TEKNOLOGI PETRONAS

PEMBERITAHUAN / SAMAN KESALAHAN LALULINTAS
(PELAJAR)

TARIKH 25 MAC 2004 MASA 0835

NO. KENDERAAN WKS 7153 JENIS KERETA/MOTOSIKAL

1202/3 TEMPAT

JENIS KESALAHAN MELETAK KENDERAAN DI TEMPAT LARANGAN KENCKAR
2/6/7/5 LARANGAN LETAK KENDERAAN

NAMA PELAJAR ....

NO. PELAJAR .... KURSUS ....

Dengan ini adalah diberitahu bahawa anda telah melakukan kesalahan seperti yang tersebut di atas. Di bawah Bahagian IV, Peraturan Tatatertib Pelajar, Kes ini boleh dikenakan hukuman tatatertib terus. Anda dikehendaki membayar kompaun di kaunter kewangan UTP sebanyak RM 50/- .... sebelum ~~24 MAC 2004~~ 24 APRIL 2004

b.p Pengurus Keselamatan

Tandatangan Pelajar

Jika kompaun ini tidak dijelaskan pada tarikh tersebut, mengikut Garispanduan Tatatertib Universiti Teknologi PETRONAS, 1998, tindakan tatatertib yang **lebih tegas** akan diambil.