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**AUTOMOBILE DISPLAY AND PAYMENT
PLAN CALCULATOR SYSTEM**

DECLARATION

I hereby declare that this is the work of my own except for quotations and summaries which have been acknowledged.

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ABSTRACT

The Automobile Display and Payment Plan Calculator System is a system which helps both the customer and the sales personnel during the process of selling/buying a vehicle. The system incorporates a display system that is able to present multiple views of the vehicles available for sale to the customer, including a 360° external view of the vehicle. The system is also capable of formulating a Payment Plan for the customer so that they can scrutinise their choices better. In cases where the customers are not able to purchase the vehicle of their choice, an agent within the system is at hand to help the customer by providing alternative choices to the customer. This system is the product of this project. This thesis will detail all the work that goes into planning, constructing and implementing the system.

CHAPTER 1

INTRODUCTION TO THE PROJECT

1.1 Introduction

This chapter will discuss about the problems that surface in the process of selling vehicles when it is conducted without the vehicle being actually present. It will also discuss briefly what can be done in order to solve the problem partially on in its entirety.

1.2 Background of the Problem

In the ever-growing automobile sales industry in Malaysia, the implementation of a computerised system to help customers make their decision on which vehicle to buy is something very new. Hence the significance and potential benefits that can be gained from implementing such systems in Malaysia is something that has not been fully realised in, especially by the players in the automobile sales arena.

Profit-seeking organizations are always on the lookout for ways to maximize their sales. Marketing is an essential method of realising this goal.

Grabbing the customer's attention and attracting their interest is a vital first step in securing a sale. Therefore, having the right tools to help improve the sales is essential.

Nowadays more and more companies are realising the importance of using Information Technology. In fact, it is now a ubiquitous scenario for companies to employ Information Technology in almost every aspect of their business. For example nowadays, we can see the use of computers to keep records of stock in the premises like in an inventory system. Computers are used to record sales being done, replacing the cash registers previously used. Barcode scanners have long replaced manual cash registers in big supermarkets. All these systems makes it easier for the users to perform their work in a more efficient and speedy manner. When there is efficiency, customers are undoubtedly attracted to do business with the company.

However, in the business of automobile sales, the use of Information Technology is not widespread especially in small dealerships. The most important part of the automobile sales process is making the sale itself. By providing a helpful Information Technology-based tool to improve sales, this situation can be changed. The project undertaken was aimed at providing such a tool.

1.3 Description of the Problem

It has been said that buying a vehicle is likely to be the second largest investment a person would make during the course of his/her life. Therefore it is perfectly understandable that a person might want to know everything about the vehicle they wish to purchase. When a potential buyer walks into an automobile dealership, he or she would normally expect to gather as much information as possible before deciding on whether or not they want to buy a particular vehicle. Information such as engine capacity, additional features of the vehicle, mileage, colours available, accessories package available, financing structure and such are all very important information. Customers are very likely to consider all these factors before making their final decision on which vehicle they want to purchase. This is natural considering the fact that a vehicle costs large sums of money and before spending tens of thousands of ringgit on a car, customers will want to feel at ease making a big decision. That is why the information relayed to the customer must be thorough and complete.

For the sales personnel, it is very important for them to make the right impression on the customer. They have to create a very good impression of the vehicles they are selling so that the customer is convinced that they are making the right choice in purchasing the vehicle. This is somewhat easier to do if the sales pitch was done with the actual vehicle is present in the same room. In this situation, all the customer has to do is to actually visually and physically inspect the vehicle of his/her desire. However, this is not the case

with small dealerships. The sales personnel here normally face a tough time in convincing customers of the merits of their vehicles. Just by depending on catalogues and their own sales pitch is may not be that convincing for the customer. In the end, the customer may not want to purchase his/her vehicle at that particular dealership. This is in fact, a sale that was lost.

There is also the financial aspect of making a deal. The price of a vehicle is of course one of the most important aspect to consider when a customer wants to buy a vehicle. In Malaysia it is highly common for dealerships to give out sheets of photocopied paper cramming all the relevant details of several cars on one page. Although most of the important information is available in those sheets, but it more often than not leaves the task of making comparisons and making decisions entirely in the hands of the customer. The presentation of such information also leaves much to be desired. It could, and should be more appealing to the customers. Customers' attention has to be won before anything else can be done.

It is here that the essence of this project lies. This project aims to create a system that would act as a one-stop centre that would be capable of providing most of the answers to the questions likely to be asked by the potential customers. On top of providing the customers with relevant information, the project also aims to create an intelligent system that would help in making the right selection for customer based on certain criteria, such as total price and the amount of monthly payment affordable.

By providing the customer with all the necessary, important and relevant information through the use of the system, it is hoped that the problem of attracting more customers to small dealerships would be minimized.

1.4 Scope of the Project

This project aims to solve a number of problems that mainly occur in dealerships that lack in showroom space and trained, experience personnel.

These dealerships usually do not have the necessary space to store all of the vehicles on or in their premises. Although there are many aspects that a customer considers when buying a vehicle, they can really be attracted if they can actually see the vehicle. This puts the small dealerships in question at a disadvantage. On top of that, these establishments usually employ inadequate numbers of staff. They also face frequent changes in personnel because people tend to see the job of automobile salesperson as a temporary job before getting a better job.

Another aspect of the automobile sales process is the confusing structure of financing that most dealerships employ nowadays. Just by scribbling all the necessary figures and numbers on a piece of paper for the customer may confuse them rather than convince them. Such values that go into the calculation of the payment plan such as price of the vehicle, deposit paid and also interest rate applicable must not overwhelm the customer. The customer needs to see the calculation process be done in a practical manner

instead of watching the sales personnel perform such complex calculations on paper. This problem is further compounded when the calculations differ from one sales personnel to another.

In this project, the product created was designed to contain modules that help to address the problems mentioned above. The modules are:

1. Automobile Display Module

This module will provide the customers with visual view of the actual vehicle that they intend to purchase. Apart from displaying the vehicle, customers will also be presented with all the relevant and important information pertaining to the vehicle. This module provides an uncluttered but complete overview of the vehicle.

2. Payment Plan Calculator Module

This module provides an easy-to-understand presentation of how the financing of the vehicle is calculated. In addition to that it can also provide the customer with a printout that details the financial aspects of purchasing their desired vehicle.

3. Administrator Module

This module provides the administrator of this system to make changes to the contents of the system. This includes adding, deleting or updating the details of vehicles for sale. It also provides the administrator with a way to

keep records on customers that make bookings to purchase vehicles after viewing it using the system.

4. Vehicle Search Module

This module is a search engine that takes into account the criteria set by the user. The criterion that is set, either make of vehicle, model, engine capacity, year produced, colour or budget, is then used by the module to find a suitable car for the customer.

To implement all of the said features, the system would be built using software such as Visual Basic, Microsoft Access, Macromedia, Macromedia Flash and Adobe Photoshop

1.5 Objectives of the Project

Listed below are the objectives of the project:

- To analyse and understand the process of selling automobiles.
- To create an intelligent system that contains all the relevant and important information regarding the automobile sales process.
- To create an intuitive module within the system that would suggest suitable vehicles for the customer based on factors and the criteria defined by the customer.

1.6 Significance of the Problem

The problem faced by the small dealerships in making sales pitches is something that is not really being pursued by anyone using technology based solutions. It is hoped that the sales tool produced as a result of this project will be a starting point for future projects and research that aim to address any similar problems. It is also hoped that by implementing this systems the potential gains and benefits can be realised so much so that it would spawn more similar projects aimed at tackling the problem at hand.

1.7 Limitations of the Project

Among the limitations that were faced during the course of completing this project are:

- **Time**

Due to the shortened period of the semester during which the project takes place, extensive self-testing, user testing, and simulation runs could not be performed.

- **Lack of previous similar work.**

When the project was being done, it was discovered that there was a serious lack of previous work being done in the problem area. This was really apparent in Malaysia. There are no precedents that could be used as a guide in completing this project although there were some systems that employed part of the strategy and features being used in this project.

1.8 Outline of the Following Chapters

Chapter 2 – Literature Review

This chapter discusses the relevant literature pertaining to the project at hand and also previous projects that have a similarity with this project.

Chapter 3 – Research Approach and Methodology

This chapter will discuss the approaches used in soliciting information to formulate the system's requirements and the methodology used to create the system itself.

Chapter 4 – Construction

This section will discuss all the details of the construction phase of the project. It will cover the design of the system, the development approach and the software/hardware requirements.

Chapter 5 – Results and Findings

This chapter will discuss the results and findings of this project. It will also present a thorough evaluation of the merits of the system.

Chapter 6 – Conclusions and Recommendations

In this section of the thesis, the conclusions that have been formulated based on the findings of the project are discussed. In addition to that recommendations deemed suitable are also presented in this chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In this project, the literature review will cover what has been mentioned about automobile sales systems in dealerships. It will also list down all the definitions pertinent to the project as well as discuss any similar projects previously or currently undertaken.

2.2 Detailed Description of the Problem

In the business of automobile sales, the goal of the participating business entities is of course, to maximise sales. Like any other profit-seeking entities, companies in the automobile industry are always interested in ways to make their products interesting and attractive. P. Sellappan in his book entitled *Information Technology in Business* (2002) noted that the sales function of a firm deals with marketing strategies such as adopting innovative approaches to selling goods and pricing them competitively. It is always a good idea to explore new ways to attract customers and by implementing Information

Technology-based solutions businesses can expect to see increases in sales and productivity and reduction in costs (Sellappan, P. 2003).

Generally, when a person plans on buying a new automobile, he or she would visit an automobile dealership and walk through an array of vehicles parked there to look for one that might interest them. However, this method of looking for suitable automobiles is restricted to companies with big dealerships that have the capacity to display a wide range of automobiles. This method is not possible for small dealerships. Therefore, to compensate this shortcoming, a new method or tool must be introduced. Currently these small automobile dealerships would resort to using catalogues and pamphlets that contain the pictures of vehicles available for sale. The sales personnel also face the hard task of having to convince the customer to buy a vehicle that he/she have not physically inspected.

It is here that potential buyers sometimes find problems that might affect their decision on buying a vehicle from a dealership. Dealerships are always on the lookout for tools that boost sales and assist the customer (Sedorchuk, Ray. Dealernews Top 100, 2002). Laudon & Laudon (2004) has suggested that the use of Information Systems is absolutely essential for businesses to remain competitive and to prosper.

To address this problem one of the features of the system developed in this project is to provide a view of the vehicles available for sale. The view provided is through an extensive array of pictures showing the internal and

external view of the vehicles available. When available, there would also be a 360° external view of the vehicle.

In the whole process of buying a vehicle, the part where the financial aspects are concerned is where customers are most confused about. Most customers do not understand the mechanics of calculating the total price that they are required to pay for a vehicle. With interest rates that are different from one vendor to the other, differing sales prices and discounts being offered, it is often confusing for a regular person to figure out just how much they have to spend to get their dream vehicle.

The system developed would also incorporate a payment plan calculator. This calculator is created with the purpose of aiding the sales personnel present a clean, transparent, uncluttered, easy-to-understand and uniformed view of how payments for the vehicles are calculated and how much customers are required to pay each month, depending on the length of the repayment period chosen by customers. This customized and tailored plan can then be printed and presented to the customer for reference.

The developed system would also be helpful in dealerships where there is a shortage of sales personnel. According to Sellappan (2002) the lack of availability of skilled and trained personnel may also affect a firm's operations adversely. When the system is placed as a kiosk within the premises of dealerships, customers have a choice using the system themselves or with the help of any available sales personnel. It is also useful for newly

employed sales personnel because the system would help them to make their sales pitches to customers just like an experienced and seasoned employee.

Apart from the abovementioned problems, there is also the problem of customers not being able to suit their needs to the vehicles they desire. Such problems might dishearten a customer and cause them to cancel their desire for a new vehicle. To avoid such problems, the system will also feature an intelligent agent capable of suggesting to the customer the right vehicle for them based on criteria such as overall budget, monthly budget, engine capacity desired, type of vehicle such (compact, sedan, four-wheel-drive and such). By providing different alternatives, customers may be influenced to rethink their options and eventually warm up to the idea of purchasing another vehicle instead of the original one that they planned to buy. So, instead of the dealership losing yet another customer, they would have the opportunity to try and convince the customer to buy another vehicle and be able to make a sale all the same.

2.3 Definition of Pertinent Technical Terminologies

Listed below are some of the pertinent technical terminologies used in this project:

- **Automobile Display System**

A module contained within the system. This module will contain a dynamic display that would give the user a complete view of the vehicles in the systems database.

- **Payment Plan Calculator**

This is a calculator that would be integrated with the system. It would enable customers to factor in prices, interest rates, down payments and loan terms to get monthly payment options for the vehicle they are considering. The calculator helps prepare customers to make purchasing decisions.

(<http://autos.yahoo.com/finance.html>)