Smart Bidding Modern Antique E-shop
By
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FACULTY OF INFORMATION COMMUNICATION TECHNOLOGY

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ABSTRACT

Modern antique system is a platform that allow the consumer to purchase antique online without going to the physical store. As the digitalization, there were many businesses transforming from the physical to the online. So does the antique shop, as this Modern antique shop that we are going to develop, will be one of a complete e-shop that will convenient the consumer by applying different kind of feature and algorithm in the proposed system. The main goal of this project is to create a fully functional web application of a Modern antique e-shop.

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LIST OF ABBREVIATIONS

MVC   Model View Controller

CHAPTER 1

INTRODUCTION

1.1 Background Information

E-shop has become a trend nowadays as it has become more popular among all age group. More and more people start to shop online rather than going to the physical store because of many factor that the e-shop offered to the consumer. Other than that, not only benefiting the consumer but the retailers that are selling their product online also get to gain a lot of benefit from the online shopping. By having an e-shop mean that the things that sold is not only available locally, but it is available to everyone in the world that have the access on the internet. All the internet users have become the potential consumer for the e-shop because they will be able to discover the shop at any places. Before e-shop come across, if that shop wanted to increase their market, they would need to open many branches in other places to allow the customer at different place to reach them, but e-shop allow them not to do so because no matter where the customer is they will be able to locate the store by finding it on the internet. As we look back on the old method of selling things and buying things, people would have wasted their time to visit the shop by themselves to purchase the item that they require which is way not inconvenience compared to the e-shop nowadays.

As we are living in the digitalize revolution, the execution of this project is to digitalize the antique shop into a Modern Antique e-shop. As far as we know, there are several ways to buy antique which we can go for a face to face buying process with the seller by contacting the seller, bidding the antique at the auction or go physically to that antique shop to purchase the item. However, all the way that are mentioned above can be done by execute this project by developing a Morden Antique e-shop. By having this Morden Antique e-shop, all ways can be integrated into a system allowing the consumer to complete the buying process online. These Morden Antique e-shop were similar to other online shopping system which their purpose is to make the selling and purchasing process become more convenience and could be done anywhere. Antique is something that might be unique and difficult to obtain because of the value of that antique making the quantity limited so it might increase the difficulties of purchasing process. As a consumer, they would not want to waste time going to that antique shop to find the antique they want but in result the shop does not have the antique that they desire which is really time consuming and not convenient at all. By having this Modern antique e-shop the consumer can save their time by surfing through the e-shop to find the antique that the shop selling without going to the shop physically that will reduce the time for that consumer. Furthermore, the seller selling the antique will also be greatly benefit using the Morden Antique

e-shop because it will help the business to grow as the consumer can reach the seller worldwide. This would have brought the selling and purchasing process of the antique to a whole new level when the process is being digitalised.

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1.2 Problem Statement

For an item to be an antique we can determine it with some of the factor, which is the condition of the item, age of the item and also the rarity of the item. As we know that those factor that we mention were important factor to determine whether an item is an antique or not but when we gone through some existing system, we saw many different kind of product being display in the system. When a consumer wanted to purchase the item based on the factor mentioned above, they need to determine it by viewing the product one by one. It will be very time consuming for that consumer to determine whether the item will meet the requirement that the consumer need one by one because the consumer might need to spend time going through the product one by one. **So, one of the primary reason is that without having a filtering feature being implemented in the system it will be very inconvenient for the consumer to find for the item based on the requirement that they need.**

As the trend of the of the digitalization on the traditional shopping method, the way of the consumer purchase item and also the seller selling the item were being transform from physical in to online and so does the transaction were also being completed online. All of us know that some of the antiques were very expensive due to the rarity, so probably the seller wants to make money by selling the antique with a high price. To do so, most of them will try to sell the antique in an auction to make sure that the seller can rest assured that the sale will not collapse. At the same time, the seller will also have probability to earn more money through the bidding process during the auction because there might be potential buyer competing with each other to obtain the antique. This is also a kind of popular method for seller to sell their antique and also allow the potential consumer that desire to find rare item had the chance to obtain it. **As we can see the digitalize trend is going on, more and more tradition selling method had been digitalize into online mode which the transaction is happening online so we are expecting that the auction of antique can being perform in online mode so that the consumer and sell need not to present at the auction.** All the process of the auction can be completed automatically through the system while the consumer can let out their antique to be bided by others and the consumer can make the biding through the system. Once the process is done the seller will get paid and the consumer will be able to get the antique that the consumer bought.

Online auction act as a place where it connects all the buyer and also the seller together. Both of them were there to obtain what they need the most. When the antique is being sell what the

seller and also the buyer care the most is definitely the price of that item. Previously, if a seller wanted to sell an antique through auction, all the prices were being set by the seller himself based on his experience. We never know that the price set is really what it worth for. A seller that does not have any experience might sell the items that were valuable with a lower price if the seller does not have any experience on it. So, when everything goes online there will be tool helping the seller to identifying the values of the item and also the price of the item. As we gone through some of the existing system, we found out that most of them does not have tool that we call a price prediction on the system to help those sellers. A price prediction is a very useful tool they were important for the seller, as it can help them to set a reserve price minimum bid amount for an item based on the price that it predicts. Seller that does not have enough experience will be able to sell their item without worrying and ensure that they will receive a fair price for the item and avoid selling it for less that it values. Other than that, an e-shop will start to become bigger and bigger when it keeps improving and the amount of the content in the e-shop will also start growing big. When the e-shop grow bigger mean that the things that is sold in that shop will become more and more, so it is very important for that shop to display the product that the customer preferred. We cannot expect the consumer to search manually for the desire item that they want in this much of product that the e-shop sell. If we don't have a recommendation system, the user will only leave with the option searching the product manually. Even in the case of a small e-shop online have their item being categorized properly but the item may beyond the ability of the customer to find what they are seeking for. When a recommendation system is being applied in their e-shop, the consumer will be looking on the thing that they prefer based on the recommendation being done by the system. **So, by choosing a right machine learning is very important as it can make the system more effective and also more useful for the user.**

In conclusion, the proposed system that we were going to be develop will be used to overcome the problem statement that we had discuss above so that we can come out with a improved version of Modern antique e-shop compare to the other existing system.

1.2.1 Motivation

Nowadays, e-shop are being more and more popular as many traditional businesses were switching their way making business online. This is because online business have a lot more opportunity than making business physically so the seller tend to convert their business into online. The motivation of designing this Modern antique e-shop is to change the way most of the antique shop doing business and also try to come out with a more functionalities system than the existing system by introducing the auction function in the system. As time go on, more and more shop were digitalizing their business to increase their market because we know that market on the internet all definitely wider that the physical world. By make the bussinness method digitalized this will allow the seller and also the consumer to have easier access to the shop and also allow the seller and consumer to have alternative way to sell and purchase their antique in this Modern antique e-shop.

Other than that, we also going to implement the machine learning technique in the proposed system which is the price prediction to allow the seller to have a better environment to sell their item. This is because the seller will be able to have an overview on the price of the item before the seller going to sell the item which will make the seller have more advantage on selling on our website.

Thus, discussing on the user experience, the proposed system also going to solve the problem of consumer identify the antique based on the factor that they wish such as the category, the price of the item etc. This would not only smoothen the purchasing process but also will greatly increase the chance for the consumer to get the item that they find more easily.

1.3 Project Scope

In order to achieve to become a complete and also an efficient modern antique e-shop the system that we proposed will be having functionalities that will allow the seller and also the consumer to have a smooth shopping experience.

1.3.1 Search function

As is well known, one of the most crucial features of an online store, particularly one with a large selection of products, is the search function. We cannot really expect consumer to scroll through the pages one at a time in search of the products they are interested in. The consumer might become exhausted if they had to look over every item in the store without the search function. Without this search function it would cause the proposed system incomplete as it is one of an important features as a quality e-shop.

1.3.2 Filtering function

Antique comes from many products as we can see a chair, coin, art etc. So how do we categories them if the consumer was interested on the coin only. This had made the filtering function to become important because with this function the consumer can filter out the product categories that they were interested and look for the product based on the category. This feature will greatly increase the chance of the consumer to look for the product that they were interested and reduce the time for the consumer to look for the product one by one.

1.3.3 Add to cart function

As a consumer while we shop on the physical store if we left halfway during our shopping process, the cart will be probably being clear by the staff because the staff does not know who it belong to. So, to prevent this happen our proposed system will be having this add to cart function to allow the consumer item being saved in the cart every times he left and try to return the item that he added to the cart when the consumer is return. This is also one of an important function in the e-shop because we are trying

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to create convenient for the consumer by making the things that cannot be happen in the physical store to happen in the e-shop.

1.3.4 Dynamic web page

As a consumer, when we log on to the antique e-shop the shop should be displaying different kind of the product or displaying the products that are interested by the consumer. This can be done by using the algorithm that we had mention above which is the recommendation system to predict the item that the consumer interested based on some of the data set that we retrieve from the consumer behavior. This will allow our website to be dynamic and not static because a static website show the same content every time the consumer logs on so it may make the consumer loss interest to our proposed system if we did not implement the dynamic web page on our proposed system. So, this is also a crucial factor for the proposed system to become a quality e-shop.

1.3.5 Login sign up function

For an online system login and sign-up function is one of the most basic function that an online system should have because based on the user that sign up they can do a lot of useful things on the users data set. Other than that, it is also a method to secure your system because it is an authentication method to allow the user to perform any transaction in the system. So, this is also a feature that we are going to implement in the proposed system.

1.3.6 Bidding function

There are a lot of way to allow the consumer to buy antique as bidding is also one of a method that are used for the consumer and also the seller to sell their antique. To allow the consumer to have more option to sell or purchase the antique, our proposed system are going to implement this bidding function so that they will be having alternative way because maybe there will be some of the consumer prefer to sell their antique on this way. In that case, we allow the seller to sell their antique in either in normal way or through bidding for that antique.

Above are the functionalities that our proposed system mainly focus on as we expect that the propose system will be able to become a complete system that can be selected by the consumer. Besides, the main functionalities there will be some of the function that may not discussed by us but all the basic feature that an Modern antique e-shop should have will be covered in the propose system.

1.3.7 Project Objectives

- To develop a Smart Bidding Modern antique system by implementing a suitable machine learning system that will make the system more automated.
- To develop a smart Bidding Modern antique Eshop to replace the traditional way of selling antique.

1.4 Contributions

For the main contribution of this proposed system which is the modern antique shop is to change the digitalized the way of making business traditionally so that the process of selling and purchasing will become more convenience. From the transformation of the businesses method that is introduce by our proposed system, both the seller and also the consumer will be able to meet their demand.

From the seller perspective, the seller can gain a lot of benefit from this transformation such as the seller can increase their market because with the use of the internet, consumer from any places will be able to reach the seller. Everyone on the internet will become the potential buyer for the seller and result in the increasing of sales. Furthermore, the seller will be able to perform a new selling method that were way more easier and also effective than the traditional selling method. This selling methods will also allow the seller to gain benefit on that and by changing their way of selling method so that the consumer were more likely to purchase from the proposed system.

Next, from the consumer perspective, they will be able to find or collect the antique that they are interested on it. Before the proposed system is being develop the consumer need to visit the physical store to find for the antique that they interested or going to that auction to bid for the antique that they interested. But with this proposed system, they will have more chance to collect the antique that they interested more easily because what they need is just internet, they will be able to access the e-shop to search for the antique that they interested from anyway. Without stepping out their door, they will be able to complete the transaction from the proposed system and the item will be deliver to them. This will greatly reduce the time for the consumer to collect the antique that they were interested. Besides, with the algorithm that we had implement in our proposed system, it will be able to help the system become a more smarter bidding system that other system. The algorithm that we implement will be able to ensure the seller to receive a fair price on the item that they sell by avoiding selling it lesser that it values with the price prediction algorithm. This will lead to the seller having a better insight on the item that were going to be sell and also more efficient and fairer outcome.

CHAPTER 2

Literature Reviews

2.1 Literature Review & existing system review

E-shop have become a trend in this era and most of the consumer were switching their purchasing method toward online shopping. We found out that nowadays there are many existing online shopping systems and some of the proposed research paper discussing about the development of an e-shop by implementing algorithm, kind of architecture and also framework used. For our project we were going to develop a Modern antique e-shop which have the similar criteria based on those existing system and the proposed research paper. The following section below will be discussing on the literature review on the development criteria of the e-shop and also some existing system.

2.1.1 Recommendation Systems with Machine Learning

Using various machine learning algorithms, this article provided a comparison of various recommendation systems that can make suggestions based on information about users, items, and user-item interactions. This machine learning technique was chosen in part because, in the absence of recommendations, users would only see direct search results, which might be extremely large and make it impossible for users to locate what they are looking for. So, to solve this problem, the paper proposes a system that applies a variety of pre-trained machine learning models and conventional approaches and used them on a dataset in order to provide such a recommender [1]. The two local machines used in the proposed paper is ML.NET and Azure learning Studio.

In this proposed paper the recommender system had been broken down into three main part which is the content-based filtering, collaborative filtering and hybrid system. These were the technique that was being used to create the recommendation system. For the first technique which is the content-based filtering, the recommender systems utilize a content-based recommendation strategy to analyse a collection of documents and descriptions of products that the user has previously evaluated. Based on the features of the items that user has rated, the system then builds a model or profile of the

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user's interests. [1]. Then the recommendation system will provide an output which was the relevant score that based on the interest of the user on an item. Besides, this technique used had some of the advantage such as independence from users, transparency etc. On the other hand, the approach also contains some serious disadvantage which is the lack of in-depth analysis content analysis or over-specialization.

The next technique used is collaborative filtering which is used by analysing how a group of user behave to make provide suggestion to the other users [1]. For instance, one user will get the will get a recommendation because his friend had rated for that item, and they will have the same history in rating that item. From this proposed system, we learn that this technique offers us a few benefits, including the lack of domain knowledge requirement, serendipity, affinity towards nuances, and advantages of vast user bases. [1]. At the same time, the drawback of this technique was that the system might need a large data set of information to work, and the technique is complex and expensive. Other than that, the third technique used was hybrid system. For this system by using the voting mechanism to combine the prediction and also taking the independent result of a content and collaborative-based recommender system is the easiest and quickest way to construct this system. We can see the architecture of a hybrid system on the figure 2.1.1 below.
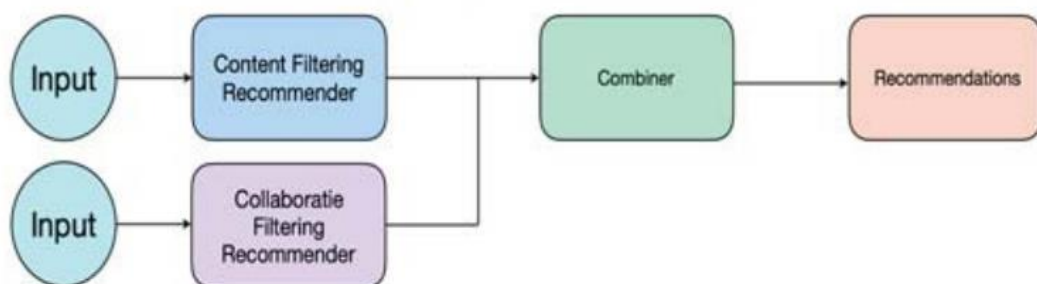
Figure 2.1.1- Hybrid recommender system basic architecture

The suggested paper then moves on to the proposed system that was based on a new recommendation approach after outlining the recommender system's methodology. The first type of system, which is based on matrix factorization, was constructed using the.NET core and.NET Standard framework. The Azure Machine Learning studio from Microsoft, which enables the creation of various machine learning models and their

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cloud-based training, will be employed in the system's second method. Consequently, after determining the type of system, the proposed paper had also chosen the data set to be used in the tanning and evaluation. For the paper, the paper was trying to forecast the user's rating that what rate would the users give to a movie so the data set used was movie.csv, rating.csv, tags.csv,genome-tags.csv, genome-scores.csv, and links.csv. After selecting the data set the proposed paper start tunning and train the machine learning algorithm to make prediction based on the data format which was the main goal of the console application build by using C# programming and .NET Core. Besides, the technique used is collaborative filtering. The second strategy, a hybrid model in Azure Machine Learning Studio, was then applied in the study. The same information that was used in the previous technique will be employed in this one once more, and a hybrid model that extends the prior pure collaborative approach will be constructed and evaluated. [1]. We know that both of the approach were used to solve the same problem but different kind of the approach may output its advantage and also disadvantage. From the proposed paper by implementing the collaborative filtering model have the benefit of coding the model by itself. In that case we will be able to control every parameter by ourselves. On the other hand, we get to see the disadvantage of using this approach due to the frequent because the ML.NET project is new, refactoring the existing code is essential. For the hybrid approach will be able to solve this problem by using the matchbox recommender and make use of the additional feature that from the dataset.

2.1.2 Microsoft Azure versus Amazon AWS Cloud Services

From the proposed paper, the paper tried to let us understand about both the Microsoft azure and also the amazon cloud service before the paper makes compares on both the service. The paper initially covers cloud computing, which relies on sharing necessary resources instead of using local servers or personal devices to carry out various types of applications. [1]. For a personal cloud storage service, it allow the user to synchronise their local information with the cloud server providing easy access and also sufficient storage for the user to store their information. Both of the companies were the global titans in this cloud service provider, but which service provider will be the most suitable for the need of the enterprise. For this, the proposed paper had given out its answer by comparing both services based on each person's needs and the workloads they were

AWS VS. MICROSOFT AZURE FOR BIG DATA

Figure 2.1.2 – Comparative on two services for big data

carrying out. Public cloud components like self-service and quick provisioning, security, auto scaling and other management services are shared by both of them. From the proposed paper we can see that both of the cloud service provider were very comparative as amazon have many aspect in service rated higher than other and also azure have some of the areas such as development and testing tool were rate higher than AWS. As for the comparative on the big data we can view the figure 2.1.2 below with is the comparative against two service for big data.

Other than that, the paper had also proposed us on what service to choose based on the needs that we require. For amazon web service, it provides effective automation and scalability options that are accessible both locally and internationally. Additionally, it has a strong application and the most trustworthy feature set, which includes different levels of protection. So, if our program needs this requirement, we can choose amazon for our services. On the other hand, if our programme had invested in Microsoft, we may explore using Office 365 or Azure Paas while accepting scalability limitations. We can also think about using Microsoft Azure if we only want to utilise one provider or need a different AWS subscription. In conclusion, you don't have to worry about the resources that outside your range because cloud computing calculates all those resources based on your requirement. It makes us flexible to share with other service but at the same time we still can use it easily. In addition, we can take advantage on the cloud computing by subscribing on their service to browser for the web with a low monthly fee. [7].

2.1.3 Chatbot implementation for e-commerce

About the chatbot implementation for ecommerce, we can see some of example on other proposed article which found useful for or proposed system. On these articles, what we are focusing is on the recommendation system that is being implement into the chatbot which the technology that we required. As we know, a recommender system provides recommendations to users based on their needs or requirements. By integrating the chatbot and also the recommendation system together we will be able to archive a more advance ecommerce website. From the article, we learn that chatbots can function as conversational recommender systems due to their nature of interacting with users via dialogue. [5]. In article [5] state that a chatbot need to have five capabilities to fulfil which the first one is Natural language Understanding (NLU). Due to the user that interact with the chatbot using a language form, the chatbot build must understand the message passed by the user. The standard method used to develop NLU capabilities for a chatbot, intent categorization and entity extraction, can be utilised to build all this capability. The next capability being mentioned on the article is keeping the conversation context because while user are communicating with that chatbot, user might expect to have a natural conversation. The idea of input and output was therefore selected as the technique to achieve good chatbot performance. The chatbot can then converse in accordance with the context that is now active by doing this. Furthermore, the article also mention that do action which the action that being perform by the chatbot is also one of the capabilities. The article also suggests that we specify the actions in accordance with what we want the chatbot to do by defining a function for each action that will be called if it is executed. Next, the paper had proposed an important capability and that is retrieving product for recommendation. The procedure described in the article involves using a SPARQL server and an ontology dataset. From this method the article state that it will be lot easier to retrieve the information, so the article is going to implement. Last capability is giving response to the user. By doing so, there are several ways to make it happen. One of the ways is by using template sentence that contain variable that can be replace with runtime value.

On the other article, it proposes that most notable chatbots that were designed with the purpose of conversational commerce were released by the banking sector [6]. For the chatbot that are going to be develop by this article is aimed to improve the user interaction on the social media marketing and at the same time making social media

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marketing more effective utilizing the quick order method. Lastly, this article also state that by connecting the system to other data source will enhance the user satisfaction due to the limitation of the data source shop.

2.1.4 Price prediction implementation

Talking about a smart bidding, price prediction is also one of the options that can be used to help to make the ecommerce smarter. From the article that we found, we know that there is a winner curse which the consumer will pay a higher price for the item that they bid for during the auction due to lack of information on that item during bidding. The consumer will not know that is that antique worth the value or not. Same goes to the online seller that does not have experience on the online auction. When the seller sells somethings on the auction, if they does not have experience, they might also sell the item below their expectation price. The article proposes that online auction had provide a huge number of data different from previous traditional auction method because through online transaction all the data can be retrieved. From all the data collected will be enough to perform some economic actors. If we utilize all these data effectively it will benefit the seller and also the consumer. By using all the attribute collected, prediction can be made by using machine learning technique. Proposed by this paper [7] , traditional machine statistical method and also traditional machine learning method can be used to perform price prediction. On the other paper, it proposed that when it come a large number of attribute will make the prediction more harder. This is because all those attribute vary in different auction. So there will be some of the factor effecting the accuracy of the price prediction. For example, in an antique auction there are many attribute can determine a price of an antique, so it will be challenging when choosing which attribute to used. The article [6] also proposed that some of the bidding happen in the last second of the auction which make the price of the antique unpredictable. On the next article[4] highlighted some of the machine learning technique that they used on predicting the price of the art in an auction. The technique that they used covered neural network, which one of the method that able to define a large parametric model. The second algorithm that they used is convolutional neural network that usually being use for image recognition. After studying on the algorithm, the article also studies on how well the machine learning can be used to predict the sale.

Next, they also made a hypothesis on the machine learning that they used so that it will be useful in scenario when prediction become more difficult.

In conclusion, there were still some people does not believe that machine learning can predict the price but however machine learning was there to help make our work simple.

2.1.5 Rubylane (existing system)

A virtual antique mall that offers many things from fine art to fashion, Rubylane is and existing antique e-shop that has an every-changing selection that with something that will most probably prefer by other seller. In this antique e-shop there are about 2000 different shop, with each shop selling different specific collectibles antique like dolls, furniture, jewelry and more. All the shop in rubylane run their business independently selling things from their shop. For the first noticeable useful feature that we can found on this antique e-shop is the search function in the system. The search function that is created by the system is very useful when we wanted to search for the shop or the item because when we insert the key word of the item there will be suggestion that will predict the keyword related to the item that we were going to type onward. As we can see on the figure 2.1.3 below the keyword, we interested to search is chair but when we type half the search function will try to predict the item that we wanted to search for and suggest the related item based on the keyword. Other than that, the name of the shop that may related to the keyword will also being shown in the search section which

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is really helpful for the user that are searching. It will allow the user to search for the item that they interested more easily.
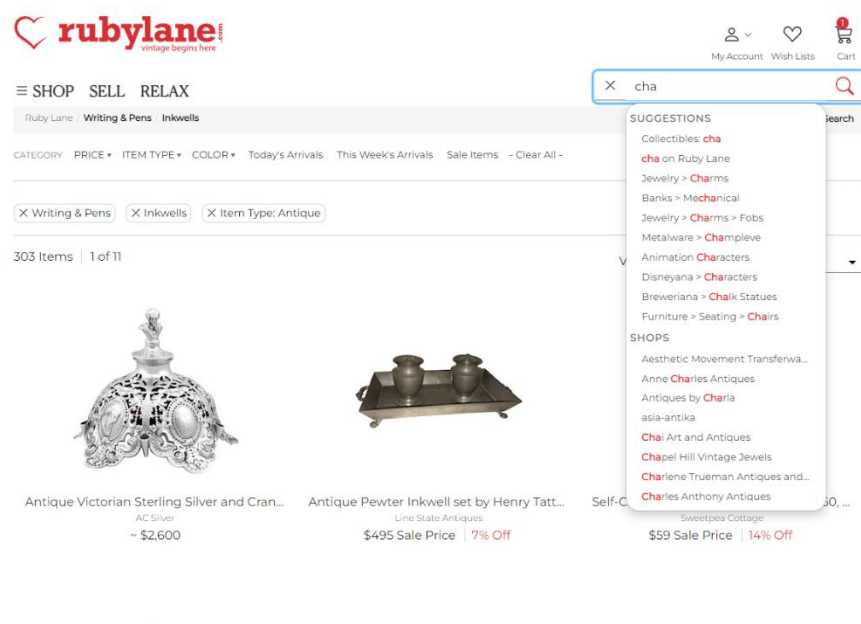

Figure 2.1.3 – search function on rubylane antique e-shop

Nevertheless, this antique e-shop still have its limitation. The limitation of this system is on the sign-up function which is not responsive for the users. As we can see on the figure below showing the sign-up page for the first-time users, the user will only have one sign up method which input all the details manually. Nowadays, many websites had already introduced many sign up way by using users Gmail, Facebook, and also other platform to sign up directly into the website but this e-shop only allow the user to sign up manually. As we can see on the figure 2.1.4 below only one method is introduced for the users to sign up as member for rubylane. This was an inconvenience way for the users because the users will be having one more account created and also one more account to be remember. So, if the users will be able to login directly connecting to their Gmail, they will be able to login in into the account directly even after a long time or even they forget the password of that account due to the account is connected to their email.

Figure 2.1.4 – sign up form for rubylane

2.1.6   1stdibs (existing system)

1stdibs is an e-commerce company that connect the design lover together from furniture fine art and a lot of things that was related with antique. It is an online market store that sell all kind of vintage things that allow the shopper to buy directly, negotiate a price or bid an item on the auction. One of a useful function that we had discover while we are doing the research on this existing system is the bidding function. In this existing system, consist of an auction that allow the user to bid for the item that they are interested to which are similar to the function that we are going to develop in our proposed system. This bidding function is very useful for the seller who wish to sell their item in a good price and at the same time make sure that there they will not have any loss in selling their item. Due to certain things being offered in the auction having a reserve price that we usually call it the minimum price for that item is normally set by the seller to prevent the item from being sold if the price drops below the minimum price, the item cannot be sold if the reserve price is met. At the same time, it also prevents the seller to reduce the loss. As we mention, on the discuss above we state that alternative method is a way to attract the consumer to purchase things on e-shop, this existing system had done it well by integrating the bidding method and also the normal purchasing method into one e-shop. This will surely attract more consumer to shop on the e-shop. On the figure 2.1.5 below we can see the example of the bidding system in this existing system.
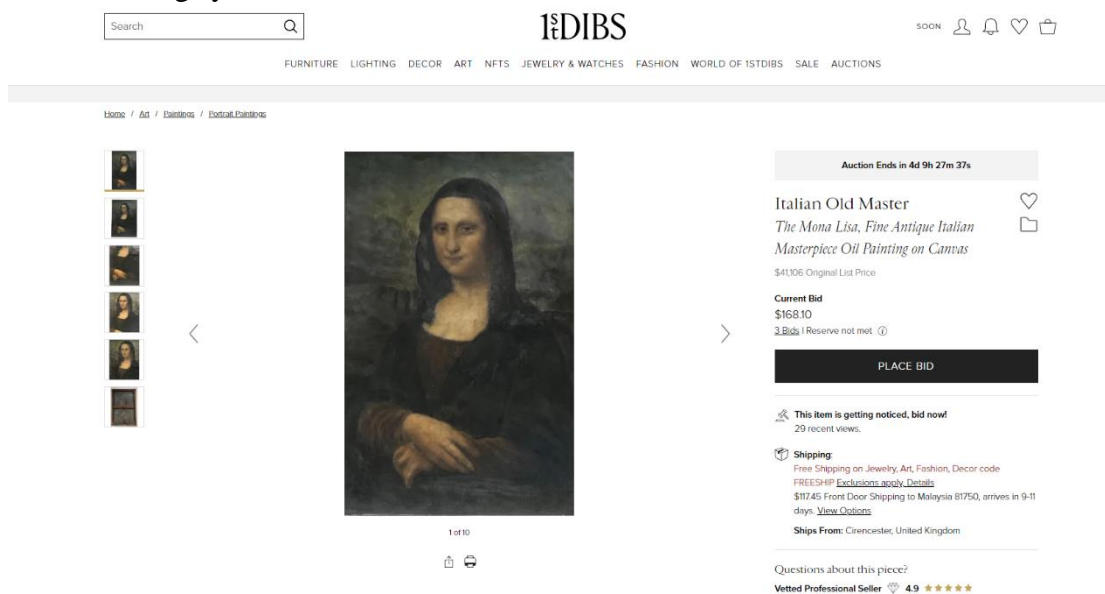

Figure 2.1.5 – web page bidding for the antique arts

Furthermore, there were also another useful feature of this existing system which is the existing system is available in the web version and also the app version. This feature had allowed all the users to shop the antique in a more convenient ways as the users can login into this existing system either with their phone or using the web page. All of the feature that can be perform on the webpage can be done on the mobile application also such as purchasing antique, shop for antique etc. For those cases, the consumer will be able to purchase the antique using only their phone which is quite convenient for them because they only need to download that application and make the purchase on that app. Figure 2.1.6 show the example of the app of the existing system that can be download from the app store.
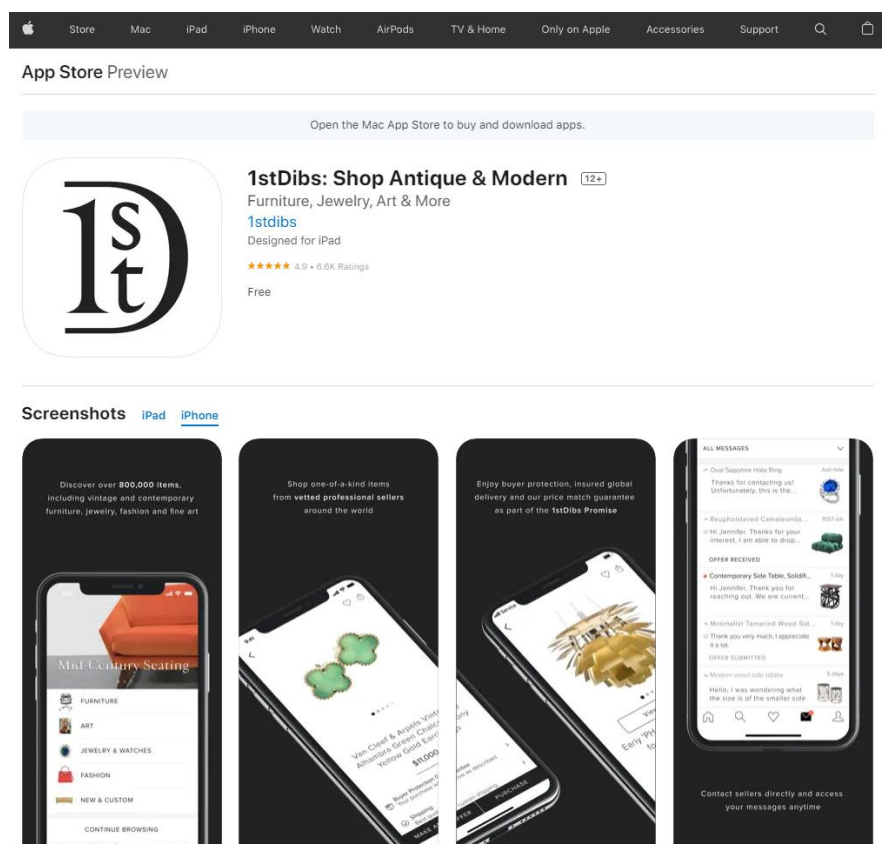
Figure 2.1.6 – existing system mobile app

Beside useful feature, there are also limitation found in this existing system is about the static web page that this existing system is using. We can see that every time when we log on in into this website the content that was being shown to the users were same ever time. The item that is being display were being the same item every time the user logs on to the website which will make the website not interactive at all. We know that to attract a consumer we need to display different item on the webpage so that some of the

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item will caught the attention of the consumer but instead doing so the existing system only allow the website to be change manually on the back end. In order to have an attractive web page to attract the consumer we can develop the page using a dynamic web page allowing the content being updated from time to time so that the consumer can get view for different item every time they log on to the existing system. Figure 2.1.7 below show the static content that is being display every time the consumer logs on to this webpage.

Figure 2.1.7 – Static main menu webpage

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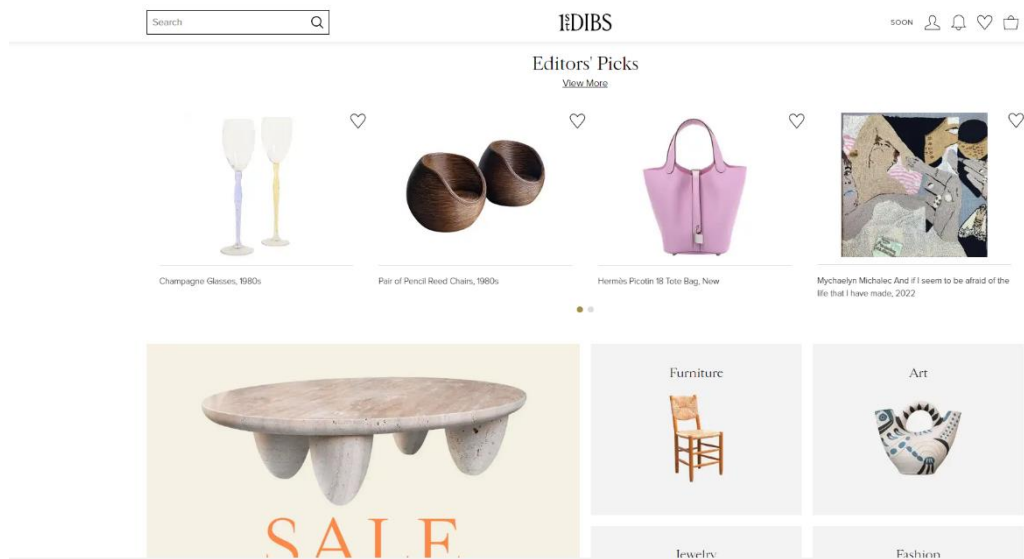
2.1.7 The French Antique Store (existing system)

The French antique store was one of the existing systems that where a consumer can get to collect different kind of antique from that store. There are many different kinds of product available in the store and most of the antiques are from the south of France. After reviewing this existing system, we have notice some of the useful feature which the first one is the add to cart function. This add to cart function was on of a useful function that allow the consumer to add the product that they interested to purchase into a cart and make payment after the consumer have complete the shopping process. The consumer need not worry to find for the item that is interested on again if the consumer leaves half ways as the item will be saved inside the cart. Once the consumer was back, he will be able to continue shopping with the item he interested being saved inside the cart which is being shown on the figure 2.1.8 below.
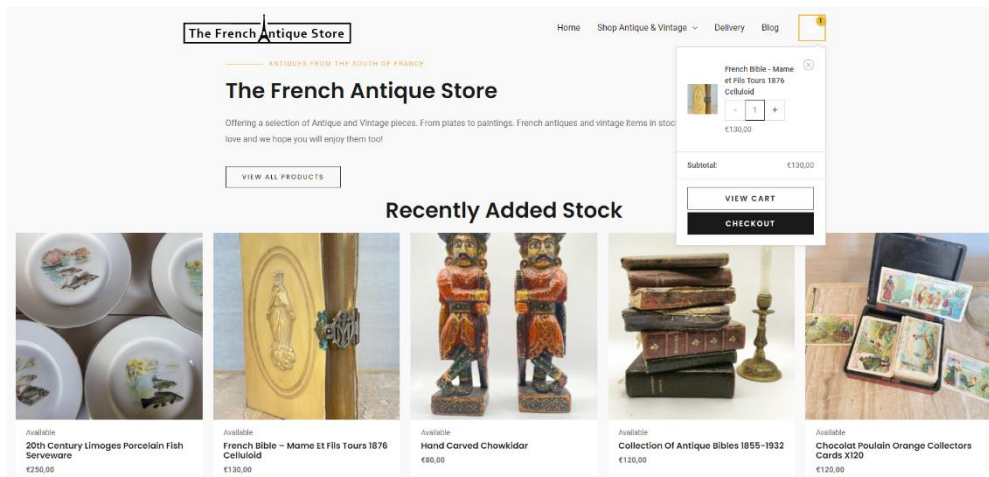
Figure 2.1.8- Item added inside the cart

Other than that, the existing system also had included one important feature which is the filtering function. We know that antique can come from many products such as plates, chair, book and many more which make the filtering function become important in an antique e-shop. This is to allow the consumer to look for the product based on the categories that they interested on. Indeed, it will reduce a lot of time for that consumer and also bring convenient for that consumer because he can directly look for the product that have been categories by the filter function together without looking on other category product. This existing system have already categories out all the product and put it inside a list to allow the consumer to choose based on the list the existing system prepare. Furthermore, the existing system also have the filtering function that allow the consumer to sort the item based on the time the item being publish, popularity, and also

price which is very useful for the consumer. For instance, if the consumer wants to look an item and he don't have high budget, he can use the filter function to sort the item price from low to high and start to pick the item based on his budget as all the pricy item will be display below at the page and all the cheap item will be display first. We can see both of the filter function that we mention on the figure 2.1.9 below.
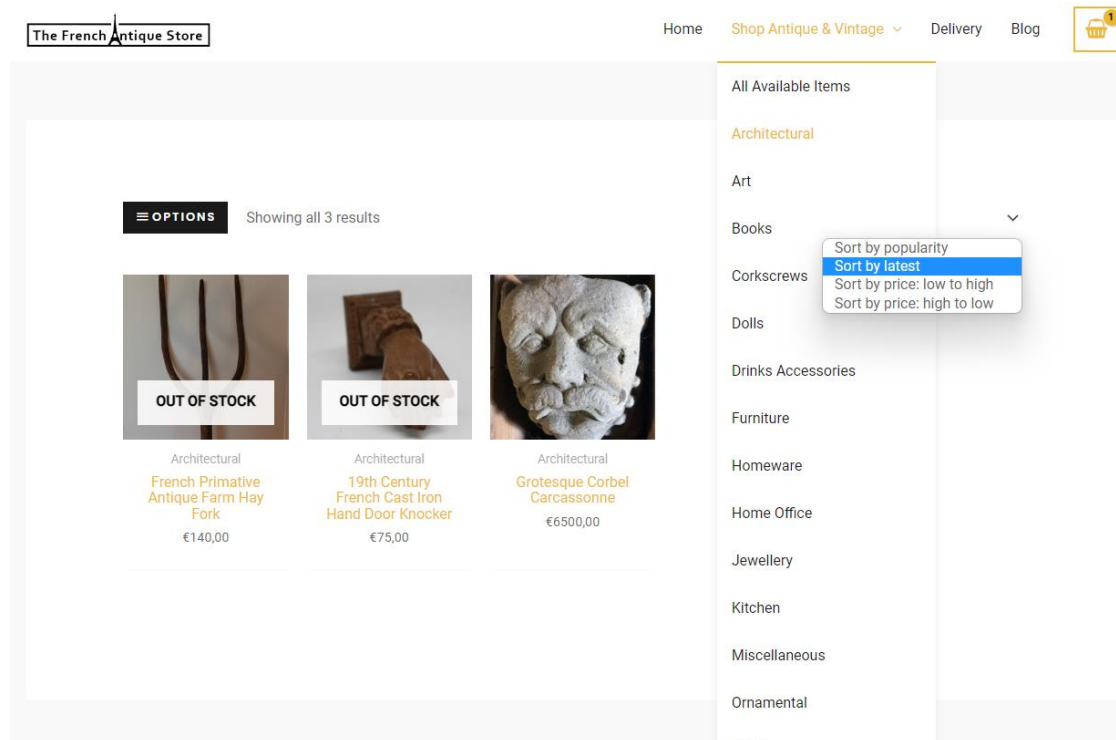
Figure 2.1.9 – Filter function on the existing system

While we were reviewing on this existing system, we had also found out some of the limitation. The first limitation that we had found out is that the existing system does not have any search function for the consumer to search for the item. As we all know that search function is one of the important functions especially for an e-shop because the product inside an e-shop is many. We cannot really expect the consumer to look for the product that they interested by scrolling through the page one by one. Without the search function the consumer might feel tired for them to go through every single item on the store. As we can see on the figure 2.1.10 below there are no search function in the existing system even the there is only 75 products in the existing system.
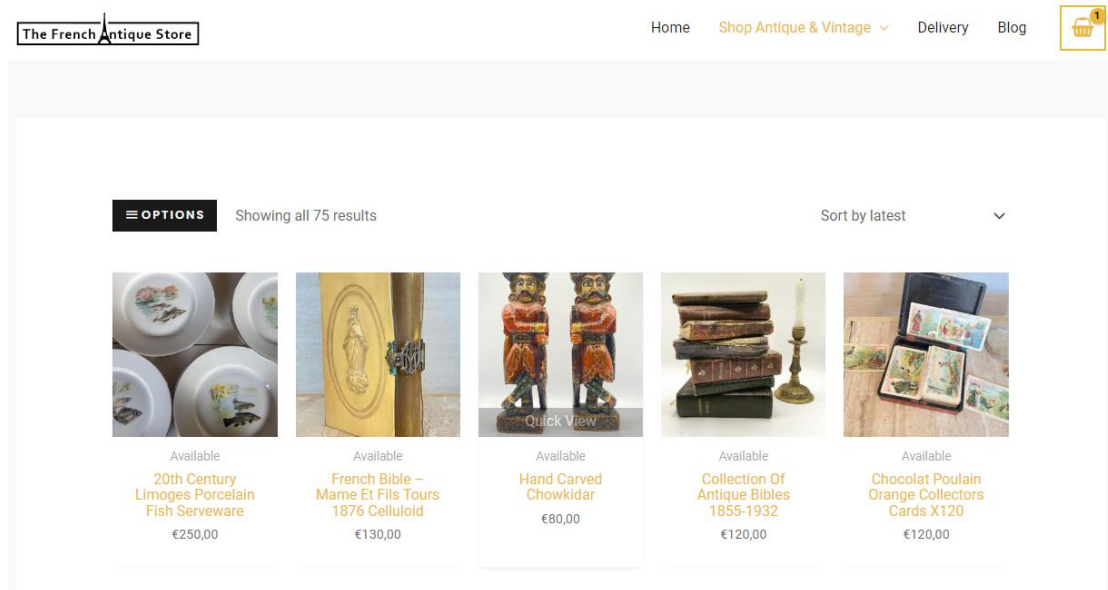
Figure 2.1.10 – Existing system with no search function

Besides that, we also found out some existing bug in the existing system which should not be existed to make sure that the consumer will have a smooth shopping experience. We found out that there is one option button that were not function properly when we click on the button. When the button was click it will pop out a side bar showing noting as this will affect the consumer experience while the consumer is shopping on the store if the consumer accidentally clicks the button and a blank side bar pop out without any content in it. A completed system should make sure that this kind of bug doesn't exist because it will affect the quality of the system as we can see the existing bug on the figure 2.1.11 below.
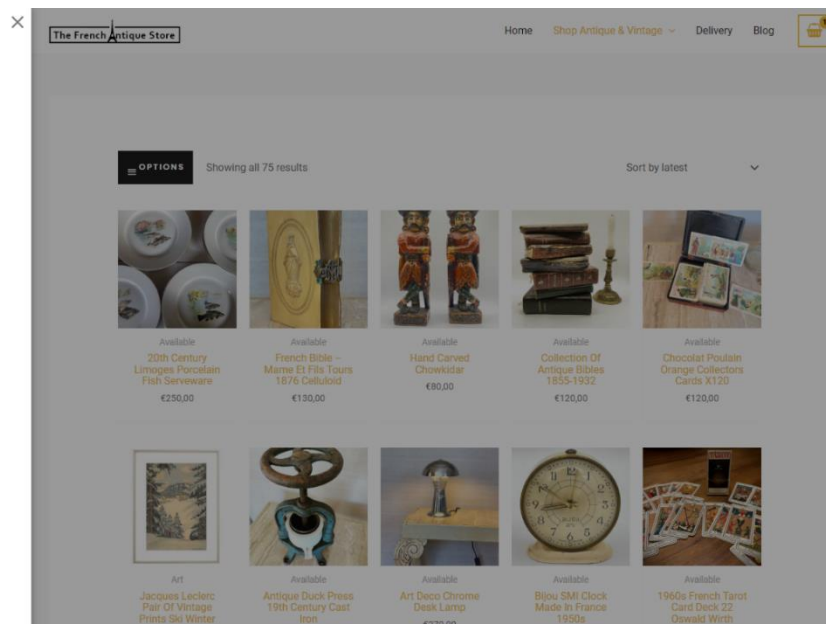
Figure 2.1.11 – Existing bug on the option button

Lastly, the limitation that we were going to discuss on this existing system is about the user log in and sign-up function. In this existing system we cannot find any method to sign up to become a part of that existing system. Consumer were being direct to the main page every time he logs on to that website. Without sign up and log in function the system will not be able to identify who is using the website. This will cause the system to lost control on the potential consumer as the system cannot tell which consumer surf a lot on that system. Moreover, this come with a bad effect if the user does not have the information of the consumer, the consumer can trick the system by purchasing things using the fake name and also the address cause a lot of unwanted problem as the system can't identify whether the user is authentic or not because everyone can make order on that existing system. As we can see on the figure above there were no log in or sign-up button or link for the consumer to become one of the member of that existing system.

2.2 Critical Remark of Previous Works

All of them suggested some helpful approaches for the Modern antique e-shop after studying all the papers and the existing systems. The previous section covered all the advantages and disadvantages of the suggested methods. We are combining some of the systems and papers that proposed redundant methods into one feature category. Below were the table that compares the benefits and drawbacks of each approach.

Table 2.2.1 - Comparison between the proposed approaches

	Rubylane	1stdibs	The French antique store	Proposed System
Search function	✓	✓		✓
Filtering function	✓	✓	✓	✓
Add to cart function	✓	✓	✓	✓
Dynamic web page	✓			✓
Log in sign up function	✓	✓		✓
Bidding function		✓		✓
Web and mobile module		✓		✓
Machine learning				✓

As we can see on the table of comparison above, we can see that the function that the existing system and also the function of our proposed system. To achieve to become a complete and more advance system our proposed system was considering to have all this function mention on the comparison table above integrated in one system. Other than that, after review for the three article about the algorithm and also the cloud services, we have chosen the price prediction for our proposed system and also the Microsoft Azure cloud service for our proposed system. This was because after we review for the approach and the services, we found out that the approach and also the services that we chosen were the one that were more suitable for our system. In an online auction site, price prediction is more helpful than product recommendation since it enables customers to place well-informed bids on items. Users can estimate an item's fair market value using price prediction, based on elements like its condition, rarity,

and demand. This can help users avoid overbidding or bidding too low and increase their chances of winning the auction at a fair price. On the other hand, because of the nature of an auction website where users are bidding on unique objects rather than buying mass-produced goods, product recommendations might not be as helpful. As a result, the suggestions might not be as pertinent to particular consumers and might not always reflect the particular item they are interested in bidding on. In short, price prediction is a more useful tool for auction websites because it gives users useful information that can help them make more informed bids, whereas product recommendations might not be as applicable or useful in the context of a distinctive and dynamic auction marketplace.

By implementing all the functionalities and also the approach together with the usage of the Microsoft cloud services, we can come out with a Morden antique e-shop that can solve all the problem statement that have been mentioned above.

Chapter 3

Proposed Method/Approach

3.1 Design Specifications
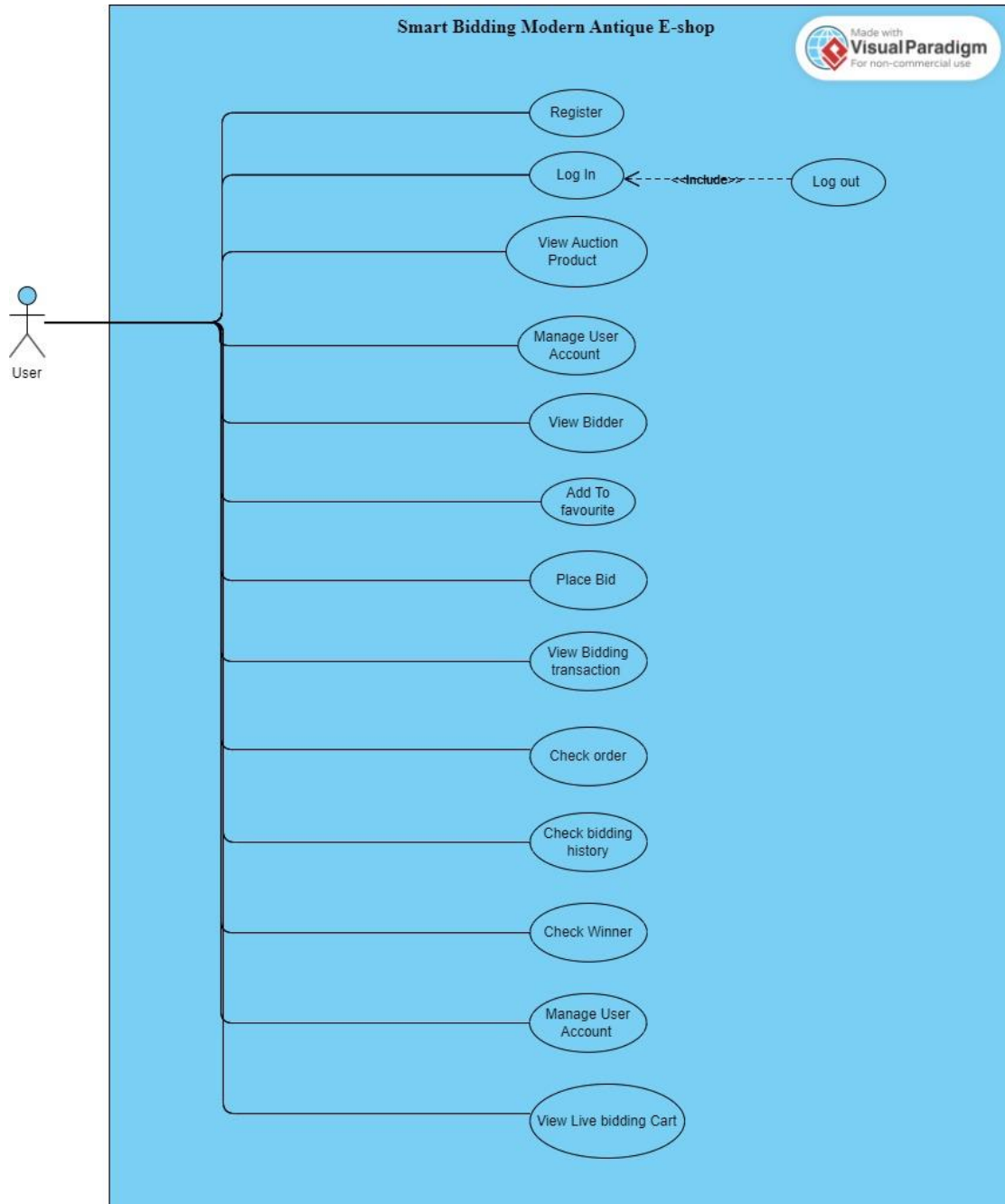
Figure 3.1.1 – Use case diagram for the User of Online Smart Bidding Antique EShop

From the Figure 3.2.1 above, our system Online Smart Bidding Antique EShop mainly focus on two target user which is the system user and also the online admin. For each target user they will be able to perform different action. From the figure above is the

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use case diagram for the user. Firstly, the user which is new to the system will be able to register as a new user. After register as a new user, they will be able to access the system and log in, all the information of the account will be store in the database. After logging in to the respective account, the user have view on all the product that is display at the system. The user can surf for the product that they were interested on it. Besides, the user can add the product they like into a favorites list allow them to have a collection of products that the user likes. This allows the user to save products that they interested and come back later to purchase the product. Furthermore, this system allows the user to bid for the product in an auction. This is one of the attractiveness of this system allowing user to experience the joy of placing bid. The user can to go to the auction page to view the product offered and if the user is interested, the user can bid for the product by placing bid on the product. The user who has the highest bid will be able to purchase the product with the price that the user bid for. There will be a Bidder history that update time to time on the user who bid on the product to allow the user to have the insight on the item that the user bid. Lastly, the user of this system was able to update their information such as phone number, email etc. The user will also be able view their bidding transaction that the user had made. The user also can check the order on the product that the user pay. Then the user also can check whether the user have won the product in the item won cart. Lastly, there will be a live bidding cart that allow the user to check on the item that the user currently bidding as the time of the auction does not end.
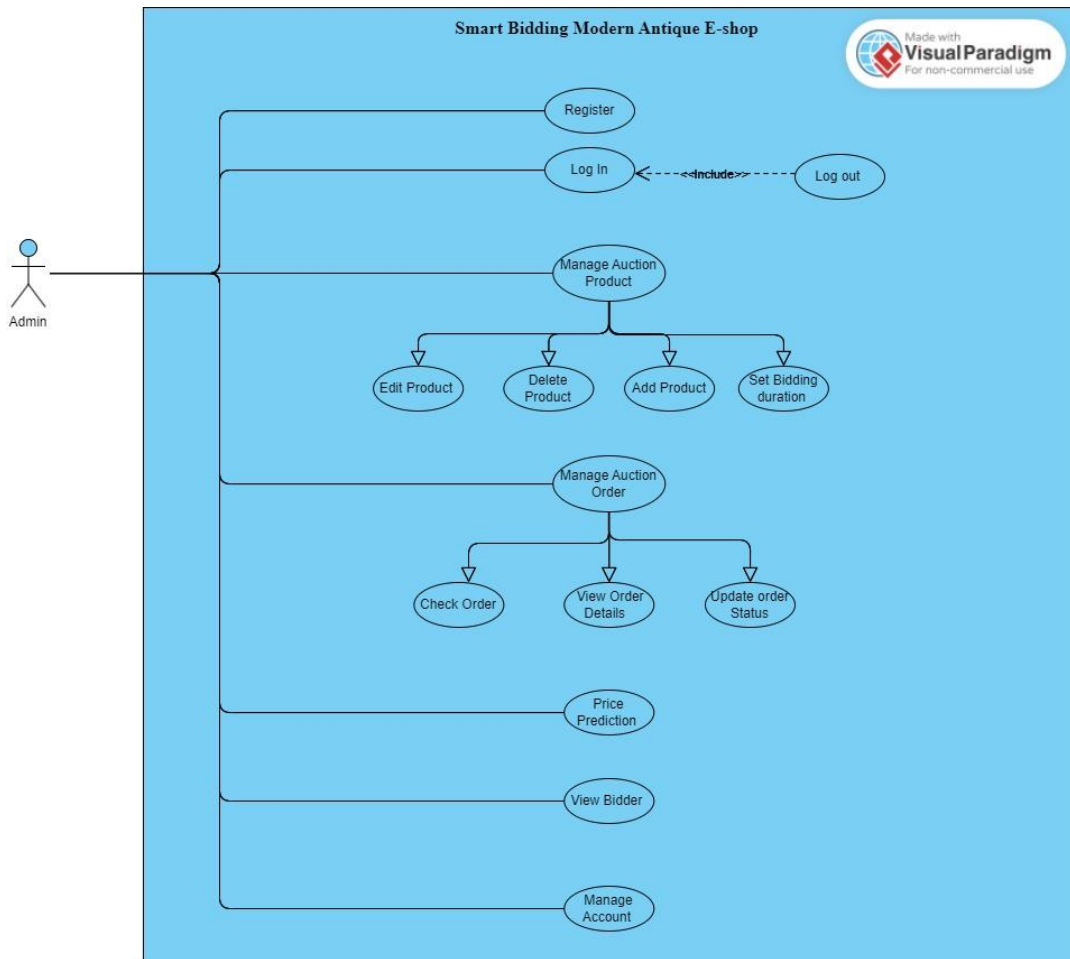
Figure 3.1.2 - Use case diagram for the Admin of Online Smart Bidding Antique

EShopAs we move on figure 3.2.2 use case diagram for the admin of our system, we can see that the admin also can perform function like the user such as login, register and also manage their account detail. The main different between the admin and also the user is that the admin will be mainly in charge in the product management. For admin, when the admin login to the website they will be redirect to the website that allow the admin to manage all the product which is separated with the user website. The admin can add product, edit the product and also delete the product. On the auction product there will be limited time for that product being sell and the way user purchase for that product is through bidding. Other than managing the product, the admin also can manage the order by checking the order. If the admin found any order, the admin also can update the order status. The admin can view the details of the order by clicking into the product. Nevertheless, the admin can perform price prediction which is the machine learning that we implement into the system by outputting the price predicted based on the attribute of the antique. Lastly, admin also can perform operation such as

viewing all the bidder at once that bid for the product as we know that admin have the higher privilege.

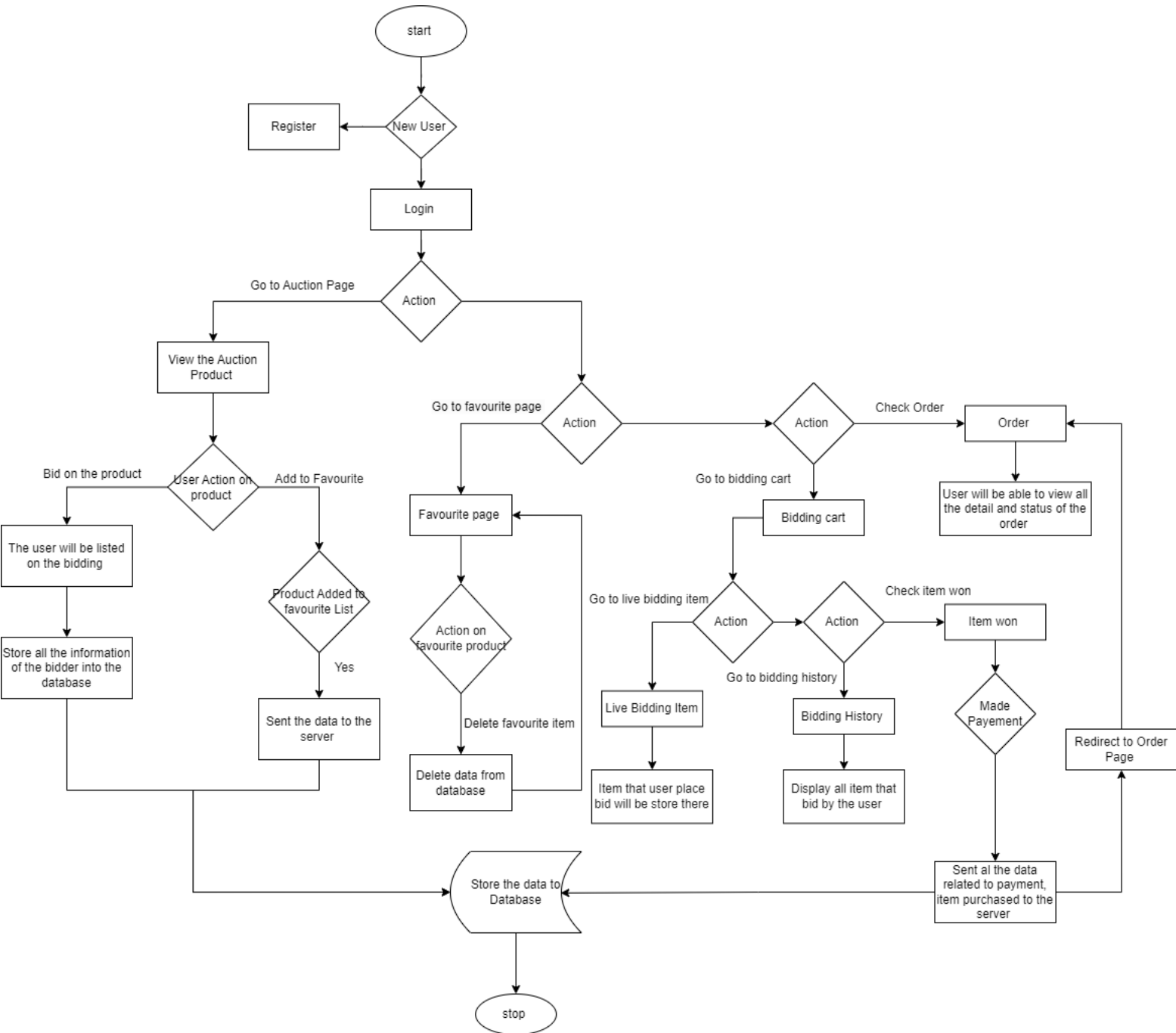## 3.2 System Design / Overview

3.2.1 User system design

Figure 3.2.1 – User System design flowchart

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Referring to figure 3.3.1 above, as a user if the user is a new user the user can choose to register before login in. Once the user login, the user will be redirect to the index page first. At the index page, if the user are interested on the auction product the user can select the auction page which will redirect the user to the auction place where all the product of the auction are place there. Then if the user is interested on that product, the user can bid for the product and the user will then listed on the bidding. All the information about the user and also the price that the user bid will be store in the database. Other than that, at the auction page the user can also select the product that the user interested but haven't decide to bid and add it into the favorite list. The system will then sent the data to the server and store it in the database. If the user want to view the favorite product that the user selected, the user can go to the favorite page to view what product the user collect. The user also can delete the item that he or she collect if the user lost interested on the product and the item will be remove from the database. Next if the user had bid some of the item previously and the time of the auction had not ended yet, the user can go and check the product that the user bid on the live bidding cart. All the item that the user still biding will be listed there. If the auction has ended, all the item will be listed at the bidding history and the user will be able to view all the product that he or she bid previously no matter the user have won the product or not. Furthermore if the user won a product, the user will be able to check the item won at the item won page and make payment for that item won. After the payment is made, an order will be generated and all the data for the payment will be saved into the database. Then the user will be redirect to the order page. All the product that the user had made payment will be generate into an order and being display at the order page. On the order page the user will be able to check the detail of the order such as the address of the order, or the details of the product and most importantly the status of the order. The status of the order will be updated by the admin and once the admin update the order, the user will be able to trace it immediately.
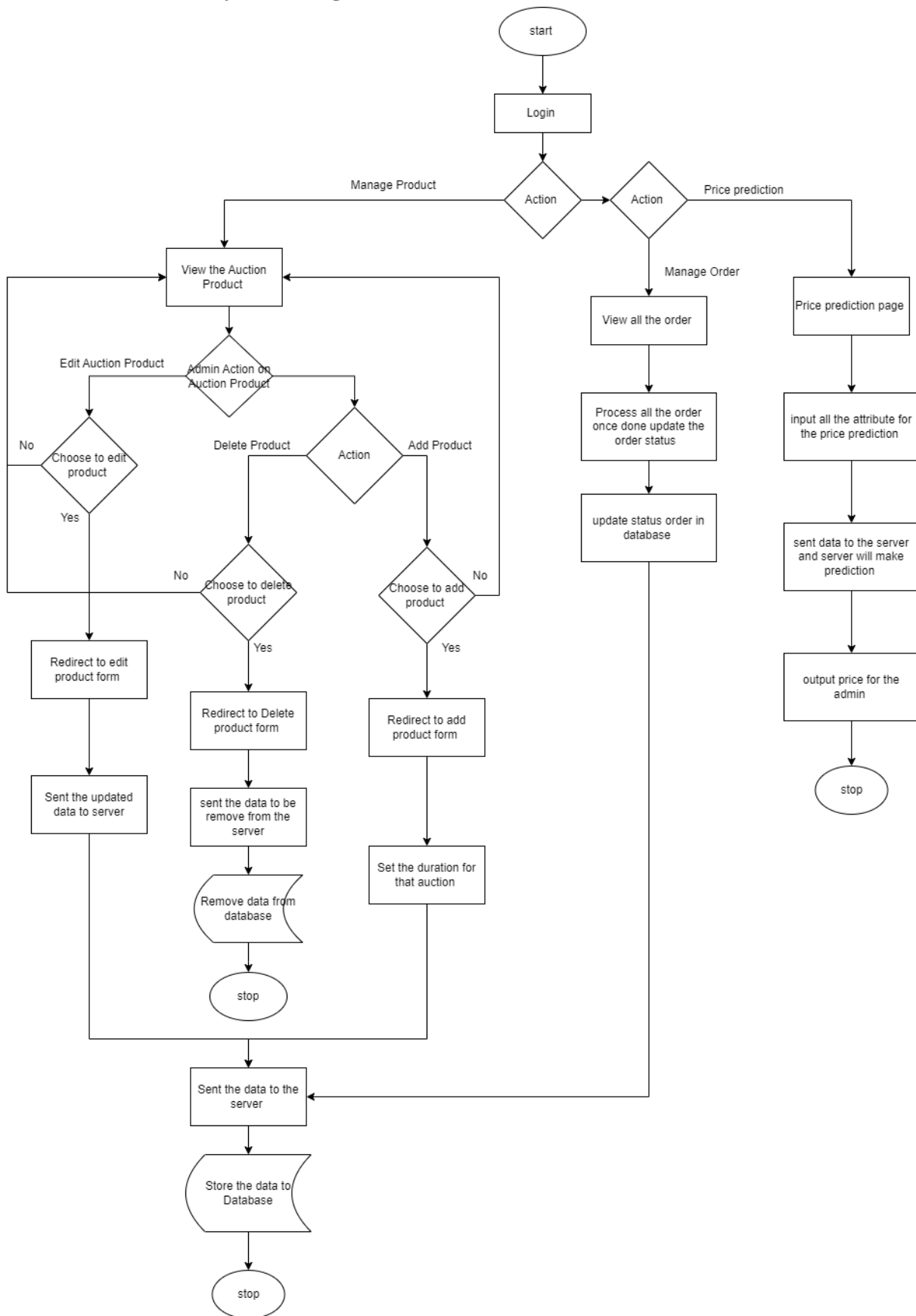
3.2.2 Admin system design

Figure 3.2.2 – Admin System design flowchart

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Moving on to figure 3.3.2, the admin system design flowchart shows the flow of an admin in the system. First, the admin will have the account prepared and the admin will need to login to the system. After logging in to the system, the admin also will be redirect to the index page first. For admin, the admin mostly in charge on managing the product. When the admin selects the auction product page, the admin will be redirect to the auction product page and view all product on the page. Besides viewing the product, the admin can choose to manage the product. The admin will be able to add new product into the system by filling a product form which conduct all the information of the product. Once done, the information will be sent to the server and store it into the database. Then the new product will be able to edit, delete or view by the admin. Furthermore, the edit function is beneficial to the admin. For example, if the admin made any mistake or need to make any changes in future, this edits button allows the admin to edit the information of the product. For the delete function, the admin will be able to delete the product that is created using this function. Other than managing all the product, the admin also responsible on managing all the order. Once the user had made payment for the product that they won, the order will be generated and being show on the order page. Then the admin will have to mange all the order by updating the status of the order for example if the order is shipped out, the admin should update the order by changing the status of the order from processing to shipped. By that, the user will be able to trace all the order. Once the order status being update, the server will also update the database at the same time. Besides that, in our system we had integrated machine learning on our system so that our antique bidding system is smarter. This machine learning is a price prediction which can be used by the admin to predict the price of an antique based on the attribute define by the system. After the admin input all the require attribute, the system will predict the price using the modal that is being define during the system development and predict a price as a reference for the admin. Then the admin will be able to have an overview on the price of that antique before placing the price for the user to bid.
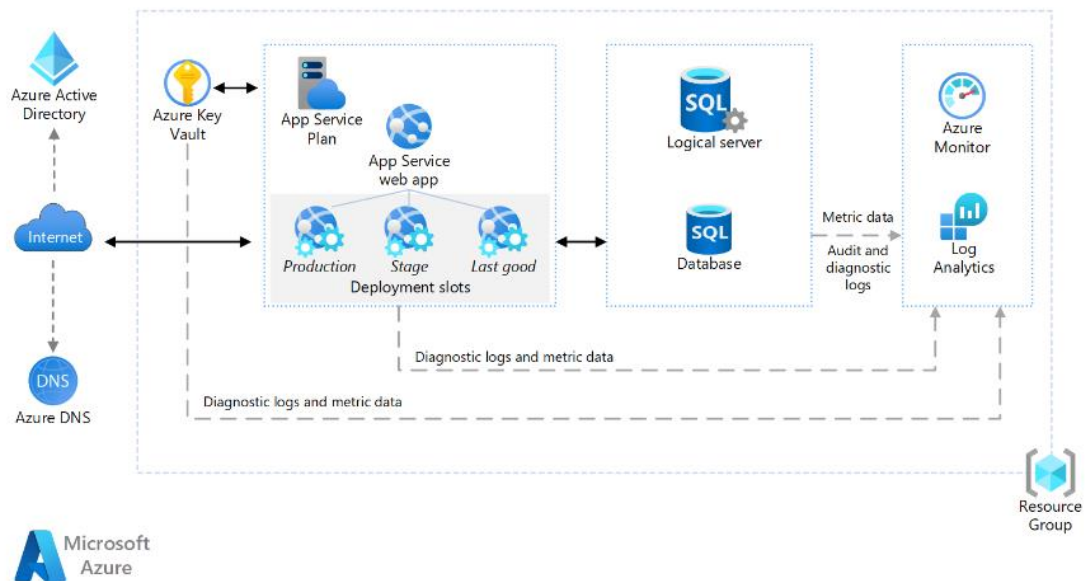
3.3 System Design

Architecture

Figure 3.3.1- Architecture of basic web application using azure

This architecture is a guideline that allow us to create our proposed system which is the Modern antique e-shop. We can see on the figure 3.4.1 above that this architecture had provide a framework for any basic web application.

As we can see from the architecture a fully managed platform for developing and deploying cloud applications is called Azure App Service that enables us to deploy web apps and create deployment slots, as well as define a set of compute resources for a web app to execute on. For the deployment slot, it allows us to stage a deployment and sawpit with the production deployment so that we can avoid deploying the project directly into the production. Next in this architecture also provide us a public IP address and a domain name. Name resolution is provided by Azure DNS, a hosting service for DNS domains that makes use of Microsoft Azure infrastructure. We may manage the DNS records by utilising the same login information, APIs, tools, and billing for other Azure services if we host domains in Azure. Besides, we also can create DNS records that translate a custom domain name to an IP address to use a random domain name (such as apple.com). Furthermore, while developing our proposed system we are going to use Azure SQL database which is a relational database in the cloud. This SQL database is available sharing its code base with the Microsoft DQL server database engine. All these ways were fully manager database service that is based on the open-

source MySQL server database engine. The architecture also provides us a type of access management service and cloud-based identity that is Azure Active Directory. that allow us to access the cloud app develop for our proposed system. For the Azure monitor in the architecture were the solution for collection, acting on log, analysing and metrics across the environment of our proposed system. Lastly the Azure Key value is in charge to support the key management which use to store application like database connection string.

Chapter 4

System Design
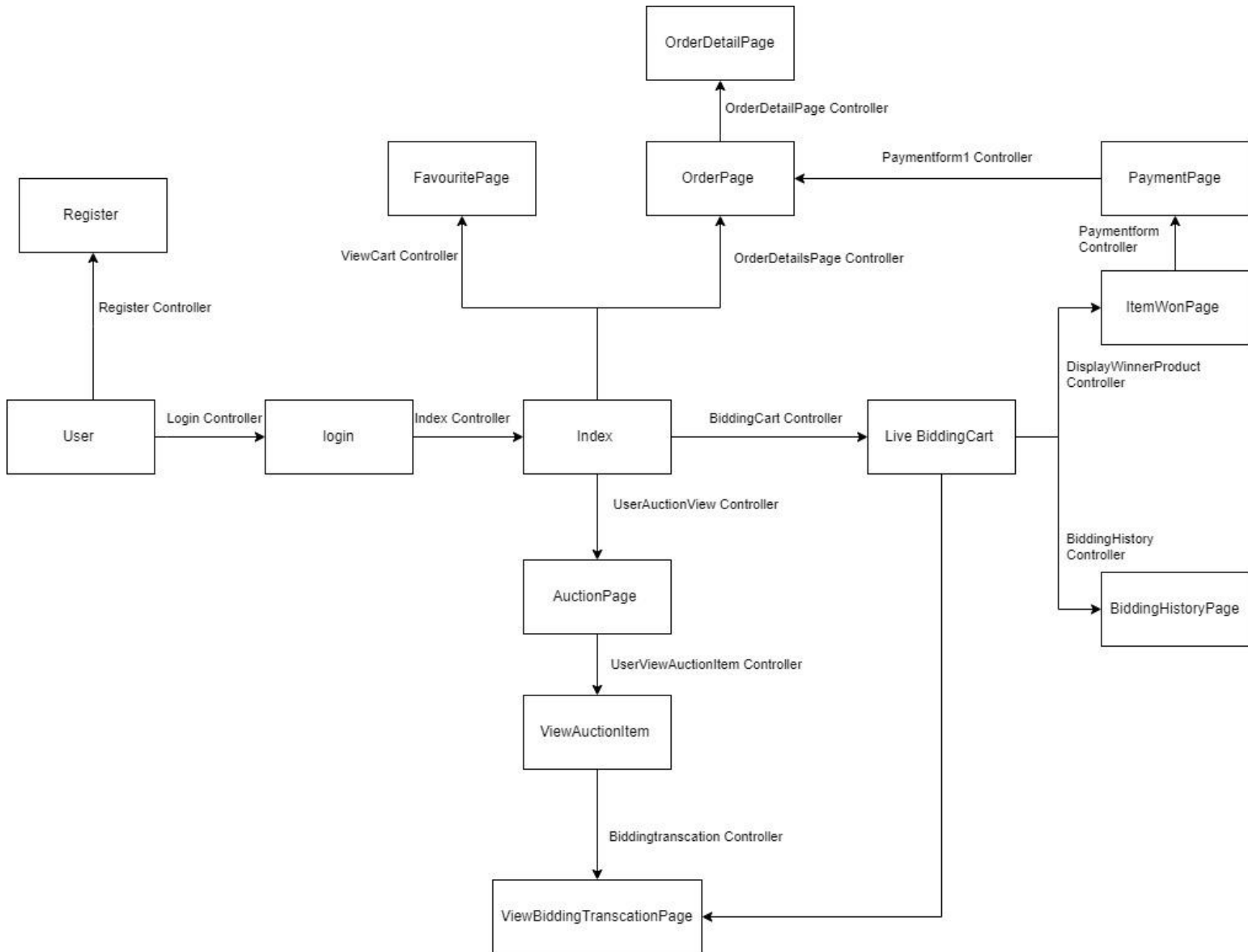
4.1 System Block Diagram

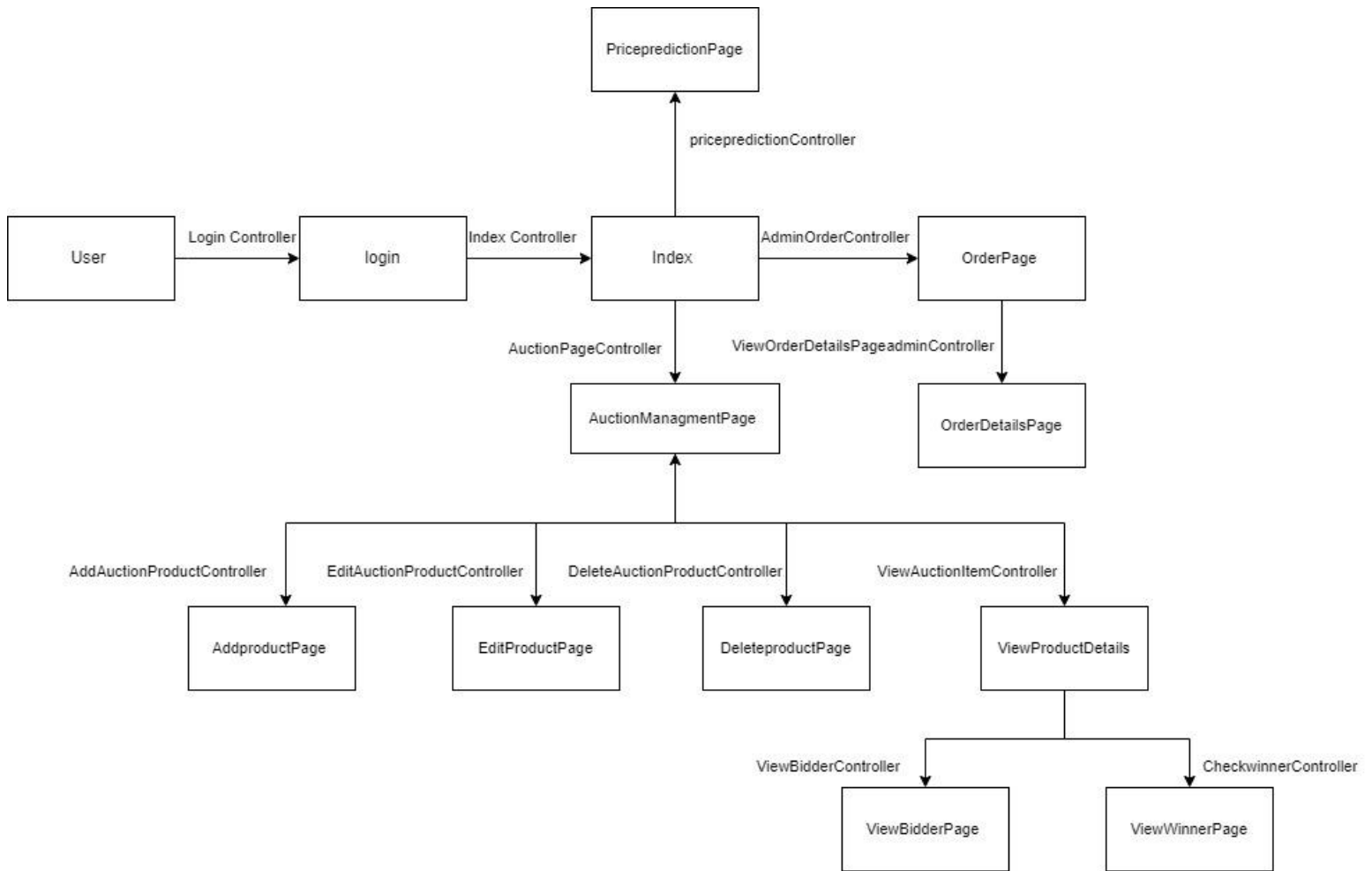**4.1.1 User Module**

Figure 4.1.1-User Module Block Diagram

4.1.2 Admin Module

Figure 4.1.2 Admin Module Block Diagram

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4.2   System Components Specifications

User Module

User

This component represents all the users that are using the system.

Register

In this view component, if the user is a new user, the user needs to fill in all the information such as user first and last name, email etc. Then all the data will be store into the database after the user fill in the information. If the user is not register, there will be some limitation on the action that the user can perform.

Login

This view component allows the existing user to login to their account they had created before.

Index

This index component is where existing user or non-existing user will be redirect to the page once the system is loaded. In this page content information about the antique bidding system and allow the user to interact with all of the content.

AuctionPage

If the user desire to view all the product that the system is selling, this component is where the system used to display all the product that is sold by the system. Besides, user can also perform sort function and also search the item by the following categories of the item in this component.

ViewAuctionItem

This component will provide the more details information about the product that the system is selling. If the user click into this component, the user will be able to see details such as the price of the product, time left for the product, details describing the product etc. Other than that, if the user are interested on bidding the product, the user will be able to perform bidding in this component. After placing bid, the user will be able to

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view his or her bidding transaction by pressing the button and the system will redirect the user to the respective component.

ViewBiddingTranscationPage

In this component, the user will be able to view all the transaction that the user had made for the respective product.

LiveBiddingCart

All the item that had been bid by the user will be display at this component is the bidding time of the item does not end. The user will be able to track on the product that the user previously bid without finding them one by one on the product page.

FavouritePage

In this component, all the product that the user were interested will be store in here if the user choose to store the product. Besides, the user also can choose to remove the product that the user store if the user loss interest on that product.

OrderPage

After the user had made payment, the product that the user bought will be display at this place. The user will be able to see all the product that the user had purchase before at this component also.

OrderDetailsPage

To view the status of the order, the user can visit this component as this component will show a more details version of the order. User also can check the status of the product at this component.

PaymentPage

In this component, the user will be required to fill in a payment form about the information of the user such as the address of the user, the name of the user etc. At the same time after filling all the information, the user will be request to make payment at this component by using their credit card.

ItemWonPage

At this component, all the product that the user had won will be display here.

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BiddingHistoryPage

All the product that the user had place bid before will be display here to allow the user to have a overview on the past item that the user bid before.

Admin Module

User

This component represents all the admins that are using the system.

Login

This view component allows the admin to login to their account they had created before.

Index

This is the component where the admin will be redirect to here when the admin first log on to the system.

AucitonManagmentPage

In this component, the admin will be able to view all the product that are being sold on the system. Other than that, the admin will be able to view all the unactive product which the auction time has ended. The admin will be given multiple option to choose in this component to manage the product such as add new product, delete the product, edit the product.

AddproductPage

In this component, the admin will be required to fill in all the information of the product that the admin wish to sell on the system.

EditProductPage

In this component, the admin will be able to edit the product that the admin wish to update by changing the information that he or she wish to make changes.

DeleteProductPage

In this component, the admin will be able to delete the product that he or she wish to delete. Before deleting, this component will display all the information that the admin wish to delete as a confirmation before the product is deleted.

ViewProductDetails

In this component, the admin will be able to view all the information of the product that the admin had insert in the add product page.

ViewbidderPage

This component allows the admin to view all the user that place bid for that particular item in this component. Besides, the admin can also perform search function or sort function to have a better overview of the information of the user.

ViewWinnerPage

In this component, it display the information of the user that have won the bidding item.

OrderPage

In this component, it display all the information of the product that the user had made payment. Once the user had made payment for the product, the product will be display in the component to allow the admin to proceed on delivering the product to the user. Once the product is being delivered, the admin can update the status of the product in this component.

OrderDetailspage

This component allow the admin to have a more details view on the order.

PricePredictionPage

In this component, it is a place where it allows the admin to made price prediction on the product based on the specified attribute by inserting all the respective information. Then the system will output a price that is being predicted by the system for the admin as a reference to place on the price of the product during auction.

4.3 System component Interaction Operation

<u>User Module</u>

Register Controller

For this controller allow the user to register a account by filling up all the information that is required and then it will create a account for the user based on the user information. Then all the information will be pass by this controller into the database.

Login Controller

When and existing user wanted to login to his account, this controller will check whether the user data exist in the database or not. If the user data is in the database, the controller will return all the data about the user. If the user is not exist, the user might not able to retrieve any information about the user.

Index Controller

This index controller will redirect the user to the home page every time this controller is called.

UserAuctionView Controller

This controller will redirect the user to the page where all the auction product was display there. All the information of the product will be retrieved by this controller from the database.

UserViewAuctionItem Controller

This controller will redirect the user to the specific product and view more information of that particular product if the user clicks the button linked to this controller. This controller will retrieve all the information if that particular product from the database and display it for example the current bidding price, details of the product and etc.

Biddingtranscation Controller

User will be able to view all the transaction of the user had made by this controller because this controller will be retrieving all the transaction data of that particular user from the database and return it to the user on the view.

BiddingCart Controller

In this bidding cart controller, it will return all the item that the user is bidding which time of the auction still running. Besides, there will be condition checking all the product whether the time auction of the product had end or not. If the time have end, the controller will first remove the item from the bidding cart because all the item that exist on the bidding cart is live item which the auction is still going on. After removing from live bidding cart, this module will check which user won the item and save it into the database. Furthermore, this module will also insert all the information of the product being bid by that particular user into the bidding history database so that all the user will be able to view on the item that the user bid before.

BiddingHistory Controller

This controller will return all the product that the user bid before with all the amount that the user had placed for that auction product by retrieving all the data from the database.

DisplayWinnerProduct Controller

This controller will return all the product that the user had won back to the respective user by retrieving all the data from the database.

Paymentform Controller (HTTP Get)

This controller is the get method of the controller. It will redirect the user to a page where the user need to fill in all the payment information.

Paymentform Controller (HTTP Post)

In this controller, is one of the post method controller which are responsible to post all the data that is being fill by the user at the payment form to the database. Besides that, the system also had applied stripe payment method which allow the user to pay the product using their credit card and the seller will be able to retrieve the money from the stripe website.

OrderDetailsPage Controller (HTTP Get)

After the user had made payment, the user will be redirect to the order page to and the product that the user had pay for will be available there.

ViewOrderDetailsPage Controller (HTTP Post)

This controller allow the user to have a more details view on the order which it display a summary of the order based on the product that the user bought. Other than that, user also will be able to check their shipping status which all the information is retrieve by this controller.

ViewCart Controller

This controller will bring the user to a page which all the product that the user favorite will be retrieve by the controller and return it on a page for the user to view.

Admin Module

Login Controller

When and existing user wanted to login to his account, this controller will check whether the user data exist in the database or not. If the user data is in the database, the controller will return all the data about the user. If the user is not exist, the user might not able to retrieve any information about the user.

Index Controller

This controller will redirect the admin to the home page every time this controller is called.

AuctionPageController

This controller will retrieve all the data of the product and display it on a page.

AddProductController

This controller will first generate a form to allow the admin to insert all the information of the product that the admin want to sell on the website. After filling all the information, the controller will post the data to the database and save all the information of the product in the database.

DeleteProductController

This controller allow the admin to delete the product that the admin desire by retrieving a form that consist of all the information of the product that the admin wish to delete. Then when the admin delete, this controller will then remove all the relevant information of that product that the admin wish to delete in the database.

EditProductController

This controller allow the admin to edit the product by retrieving all the information into a form. From that form, the admin can choose to make changes on the product that the admin wish for. Then the controller will update the database on the changes that is made by the admin.

ViewAuctionItemController

This controller will redirect the user to a more details version of the auction product which contain all the information of the product such as the detail, price etc. All the data will be retrieve by the controller from the database.

ViewBidderController

This controller will allow the admin to view all the bidder that place bid on that particular item by retrieving the data from the database.

CheckWinnerController

This controller will check the winner of the product by retrieving the data from the database. If the winner exist, this controller will return the information of the winner in a view but if the winner does not exist, the controller will redirect the user back to the auction details page.

AdminOrderController

This controller is responsible to retrieve all the information of the order from the database after the users had made payment for the item. Once the user paid for the product, there will be a controller saving all the data to the database and this controller will be responsible to retrieve all the information to allow the admin to manage all the order.

ViewOrderDetailsPageadminController

This controller allow the admin to view a more detail order by retrieving the data of that particular order from the database.

pricepredictionController

This controller will be helping the admin to make price prediction on the price of a product based on a specific attribute that is set by the system. After the admin fill the all the information that is need, this controller will make prediction based on the machine learning model that the system had trained before. Then this controller will return a result indicating the price predicted to the admin for reference on a page.

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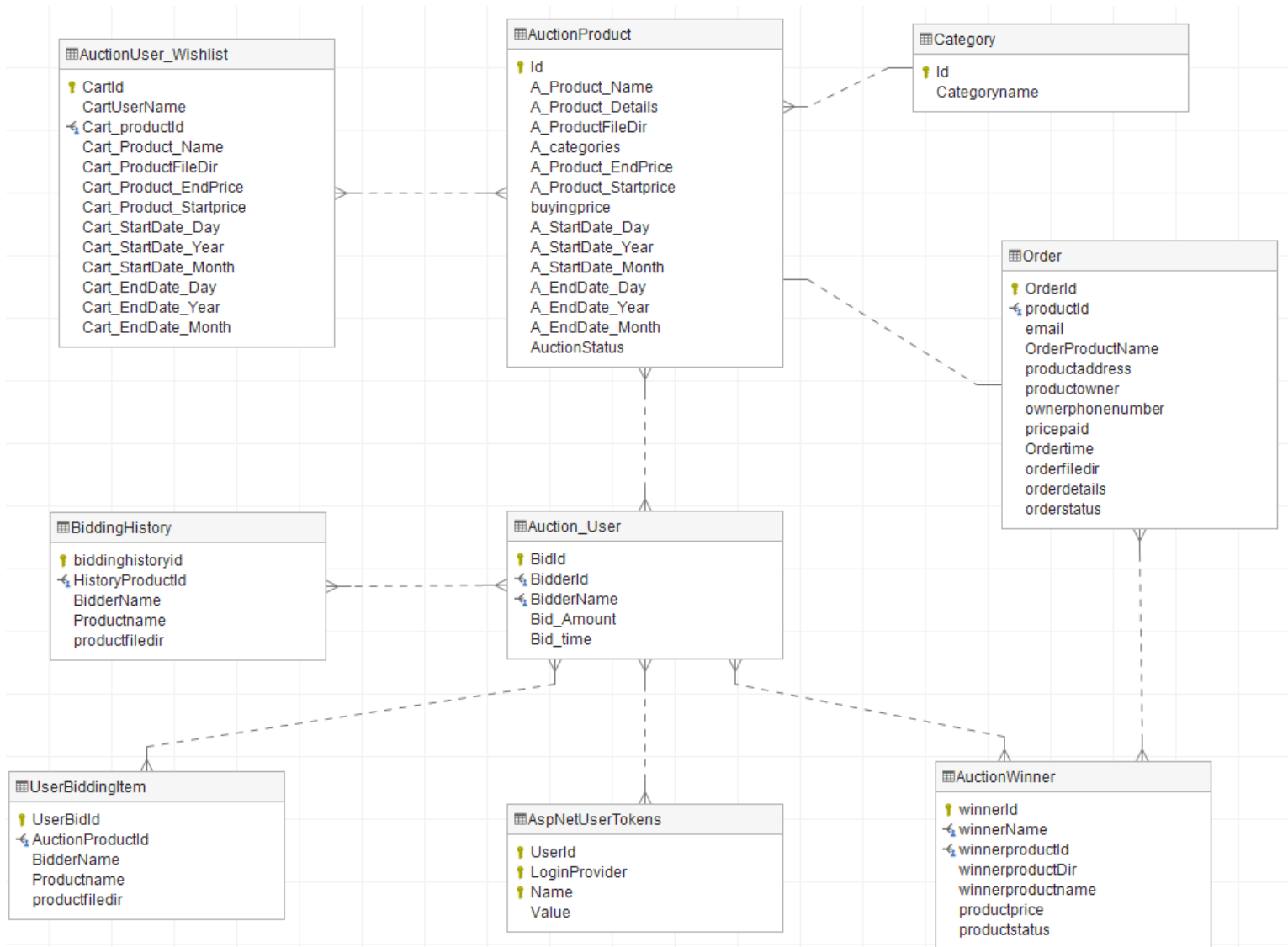
4.4 Class Diagram

Figure 4.4 – class diagram for Smart Bidding Online Antique EShop

CHAPTER 5

System Implementation

5.1. Hardware

Table 5.1.1 Specifications of laptop

Description	Specifications
Model	Mini PC PN51
Processor	AMD Ryzen 5000U
Operating System	Windows 11
Graphic	Integrated - Radeon™ Vega Graphics
Memory	DRAM MODULE(DDR4)/3200/16G
Storage	512GB M.2 NVMe™ PCIe® 3.0 SSD

5.2 Software Set Up

Table 5.2.1 – Software setup table

IDE tools	Microsoft Visual Studio
Third-party framework and plug-in	ASP.NET Core Web App (MVC)
Database	Microsoft SQL Server Management Studio 18
Software Environment	HTML, CSS, JavaScript, JSON, Java, C#, stripe, ml.net

5.3 Setting and configuration

In this part we will be going through all the configuration step before the development of our system. For our system we are using the MVC framework to develop our system which MVC stands for model-view-controller. As we know, MVC is a kind of architectural that separate the application to three main logical components. Before we deal with the MVC structure we will be dealing the configuration of the database and also some plugin that we were going to used during developing our system.

5.3.1 Configuration on the system

```
var builder = WebApplication.CreateBuilder(args);
var connectionString = builder.Configuration.GetConnectionString("ApplicationDbContextConnection") ?? throw new InvalidOperationException("Conne

builder.Services.AddDbContext<ApplicationDbContext>(options =>
    options.UseSqlServer(connectionString));

builder.Services.AddDefaultIdentity<SmartOnlineBiddingEshopUser>(options => options.SignIn.RequireConfirmedAccount = false)
    .AddRoles<IdentityRole>()
    .AddEntityFrameworkStores<ApplicationDbContext>();
builder.Services.Configure<StripeSettings>(builder.Configuration.GetSection("Stripe"));
// Add services to the container.
builder.Services.AddControllersWithViews();

var app = builder.Build();

//calling the stripe configuration(payment)


StripeConfiguration.SetApiKey(builder.Configuration.GetSection("Stripe")["SecretKey"]);
```

Figure 5.3.1.1 – Code snippets on Program.cs

On program.cs is the place where we configure or connection string. In program.cs we have two important connection which is the payment program that we used in or system, the identity which we is used to manage the user identity and also the connection between database.

```
"Logging": {
  "LogLevel": {
    "Default": "Information",
    "Microsoft.AspNetCore": "Warning"
  }
},
"AllowedHosts": "*",
"ConnectionStrings": {
  "ApplicationDbContextConnection": "Server=DESKTOP-FNLCGGO;Database=SmartOnlineBiddingEshop;Trusted_Connection=True;MultipleActive
},

"Stripe": {
  "SecretKey": "sk_test_51MutRrB2Il4nxGoKeqdgKV9oegUsSDsdV0qmJyu3GoTAWRWbR9HCAv81Fb99yDzVuwinuqOhY6HQ5S6lqfkQrXht00xvImzkGe",
  "PublishableKey": "pk_test_51MutRrB2Il4nxGoKmrq9Zk1BxuGsrPdQO2ZkGoKrQafYiHFTA2yCHsB3QwQgotqkUfazzqnXsAV5jWgNFggq9wRN00rg2mplA1"
}
```

Figure 5.3.1.2 – Code Snippets on appsetting.json

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This figure show the where the database connection string is store an also the secretkey and publishable key for the stripe which act as the payment program for our system.

5.3.2 Model

After all the configuration is done we first need to interact with our data which we will be creating all our data in the Model. The model component is in charge in the all the date-related logic which can be transfer between the view and controller or store it into the database. On the figure displayed below are all the model for the Smart Bidding Online Eshop. All the models below are used to store the data for the system into the database based on the entity that our system have. Figure below show all the model that we have in our system.
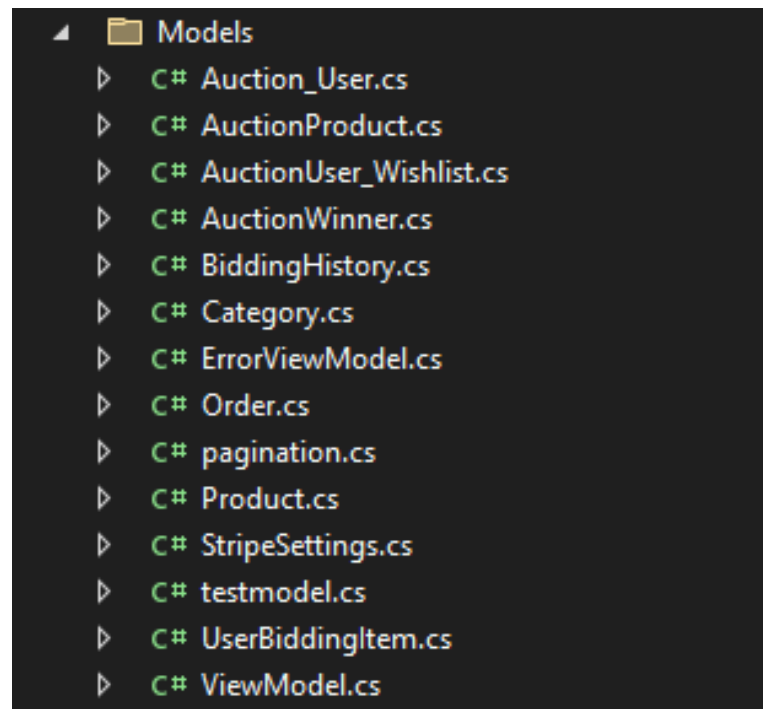
Figure 5.3.2.1 – Model for Register User

```
public class ApplicationDbContext : IdentityDbContext<SmartOnlineBiddingEshopUser>
{
    0 references
    public ApplicationDbContext(DbContextOptions<ApplicationDbContext> options)
        : base(options)
    {

    }
    19 references
    public DbSet<Product> Products { get; set; }
    37 references
    public DbSet<AuctionProduct> AuctionProduct { get; set; }
    23 references
    public DbSet<Auction_User> Auction_User { get; set; }
    6 references
    public DbSet<AuctionUser_Wishlist> AuctionUser_Wishlist { get; set; }
    7 references
    public DbSet<UserBiddingItem> UserBiddingItem { get; set; }

    13 references
    public DbSet<AuctionWinner> AuctionWinner { get; set; }
    13 references
    public DbSet<Order> Order { get; set; }

    3 references
    public DbSet<BiddingHistory> BiddingHistory { get; set; }

    4 references
    public DbSet<Category> Category { get; set; }

    0 references
    protected override void OnModelCreating(ModelBuilder builder)
    {
        base.OnModelCreating(builder);
        // Customize the ASP.NET Identity model and override the defaults if needed.
        // For example, you can rename the ASP.NET Identity table names and more.
        // Add your customizations after calling base.OnModelCreating(builder);
        builder.ApplyConfiguration(new ApplicationUserEntityConfiguration());
    }
}
```

Figure 5.3.2.2 – Code Snippets for ApplicationDbContext

This ApplicationDbContext can be used to associate all the model that we have crated that is show on the figure above to create and run queries, turn query results into entity objects, and persist changes to objects back to the database. After we have insert all the data that we required into the model we will be executing two command which is "Add-migration InitialDbContext" and "Update-database" on the Package manager console in Visual studio that will help us to create all the table that contain the attribute into the database. After the two-command executed, at the same time it will also generate two folder that correspond to the command which is the migration folder that help us migrate all our data to the database side.
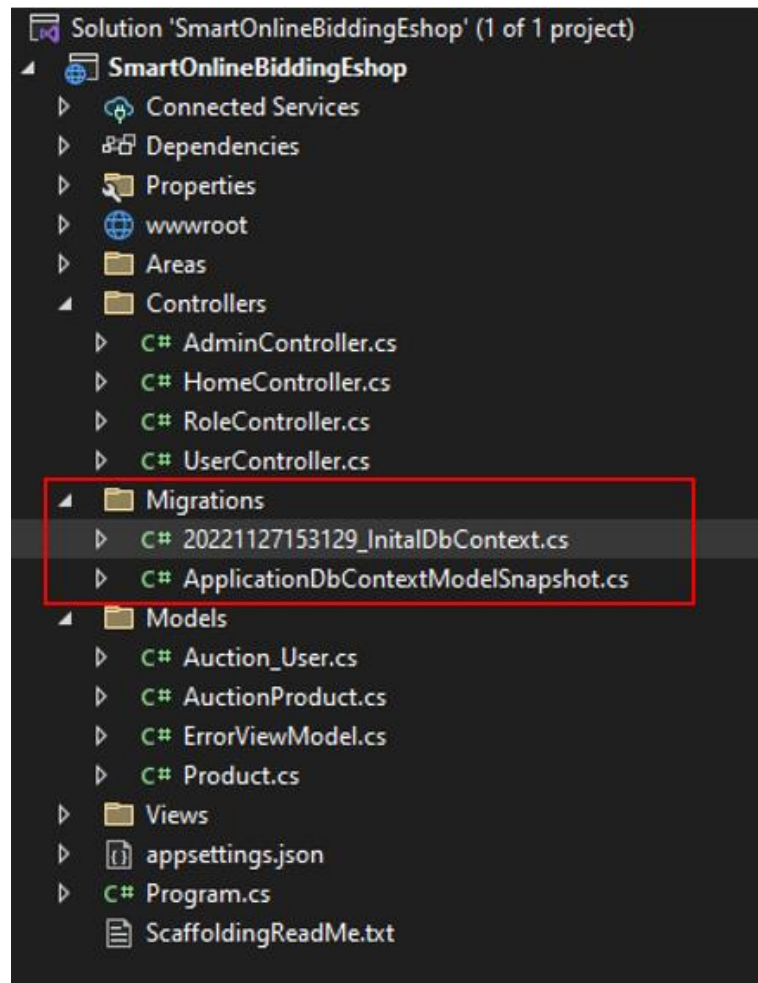
Figure 5.3.2.3 – Migration File created after the command executed

After both file is created, we can check our database to see that all of the attribute that we have create on the figure above is inserted into the database which we can see one of the example tables on the figure 4.3.7 below.
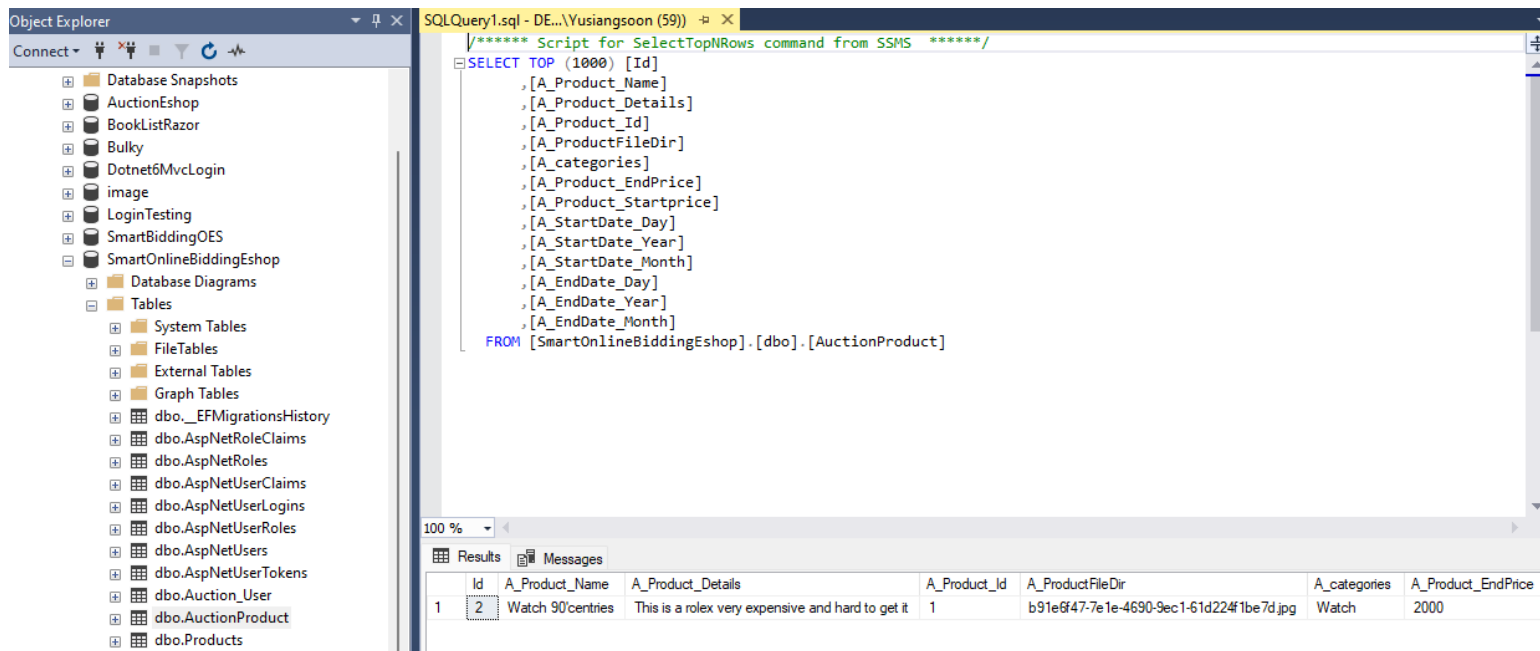
Figure 5.3.2.4 – AuctionProduct attribute in database

After all the model is completely being configure, we will be moving on to the controller which the controller is an interface between model and view that process all business logic, incoming request from the web, and also using the Model component to manipulate the data and interact with view to generate the output. For our system, we had create four controller so far and each controller have their own work to do which we are going to see on the figure below.

5.3.3 Controller

For controller in MVC, the controller is one of the core components. It acts as an intermediary between the model and view by handling all the user input and updating the model or view. The main things that the controller does it that it is responsible to receive all the user input and translate it int an action that can be perform by the model or view. For example, in the admin controller, there will be controller that allow the admin to add product by input all the product information on a form in view and then save all the information of the product into the database. In general, the controller will be managing all the business logic of the system. As we can see on the figure below, for our system we will be having five controllers. Each of them will have their different role. For the AdminController, it will be managing all the business logic that can be done by the admin such as add product, delete product, edit product, manage order and many more. Then for the home controller will be responsible to redirect the user to the home page of they system. For the role controller will be responsible to manage all the role of the user. Lastly, the user controller which is responsible on all the business logic that can perform by the user in the system.
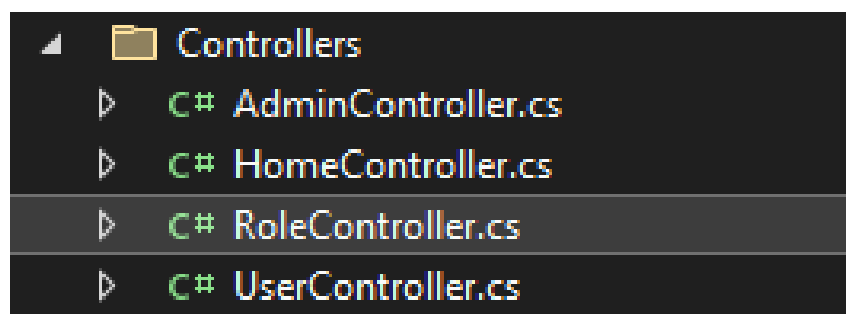
Figure 5.3.3.1 – Model for Register User

5.3.4 View

In the view component of our system all the UI logic for the application is being used there. All the function inside the controller are going to generate their particular view which is going to be display on this part. Firstly, we are going to share about the view of the admin. On the figure 5.3.4.1 below are all the view that is created which can be access by the admin. On figure 5.3.4.1 below will be all the view that is created for the user.
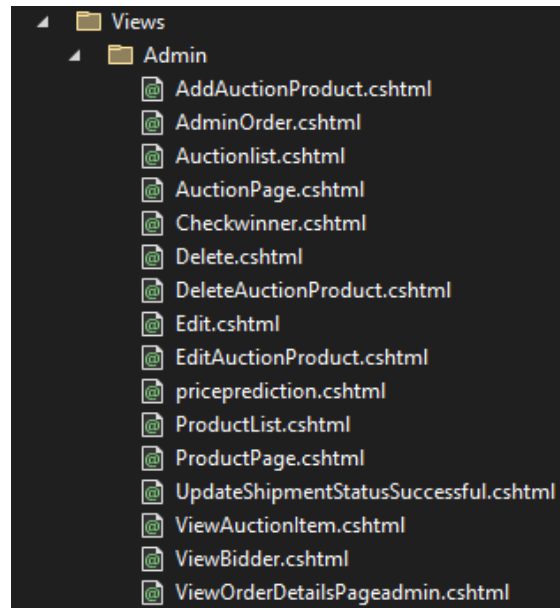
Figure 5.3.4.1 – View For Admin
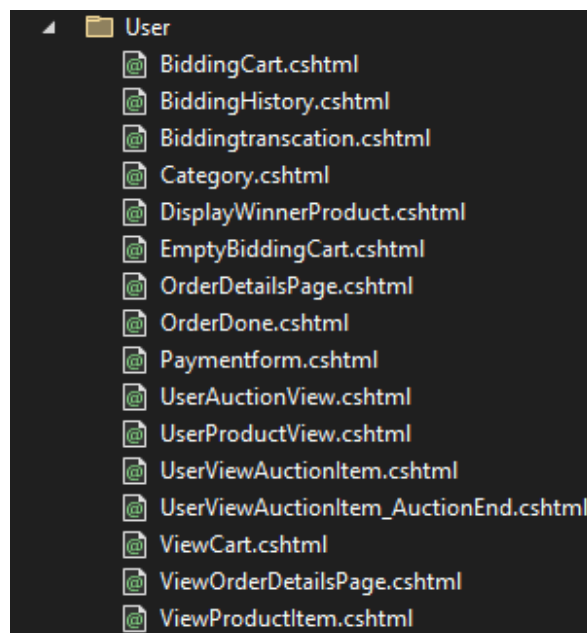
Figure 5.3.4.2 – View For User

5.3.5 Machine learning model configuration

In this section, we will be configuring the machine learning model that we were going to implement in our system. First of all, we need to go to the Nu Get Package to download the package that we need which is the Microsoft.ML and also Microsoft.Extension.ML which we can see on the figure below.
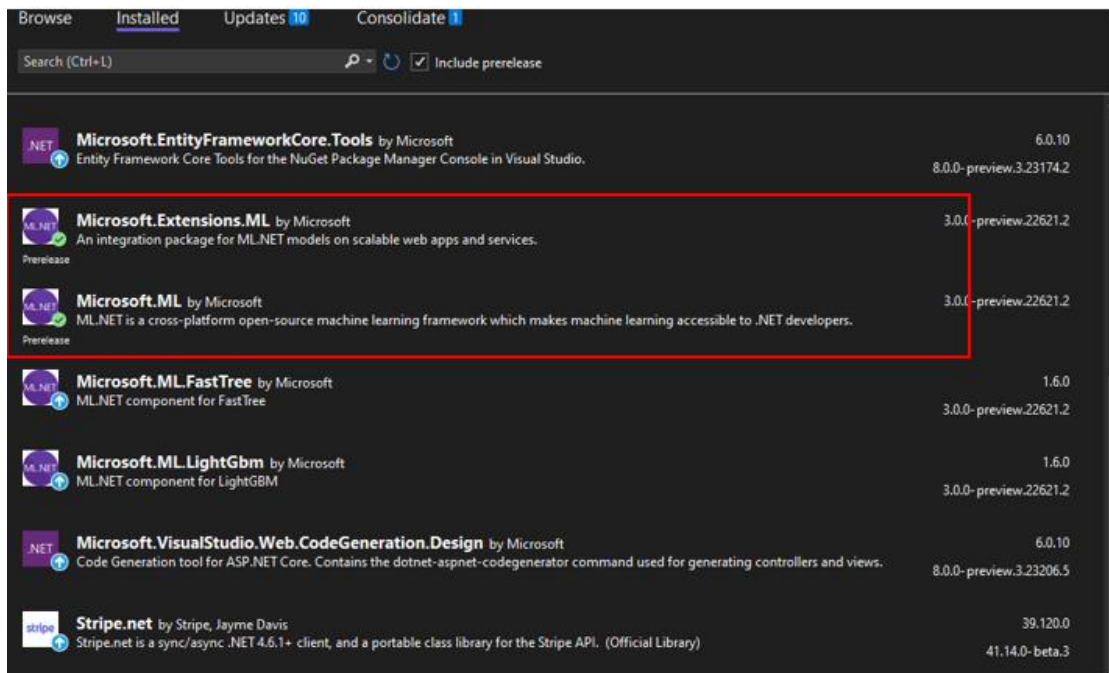
Figure 5.3.5.1 – Package for Machine Learning

After downloading the package, we need to add the machine learning to our project. Then we will be able to see the folder that we name as MLModel in our project as we can see on the figure below.
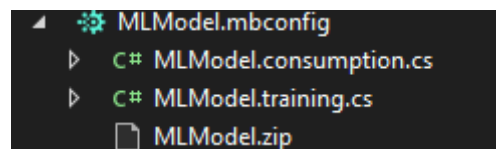
Figure 5.3.5.2 – folder for machine learning

Then we need to click on the folder and it will bring us to a page show on the figure below.
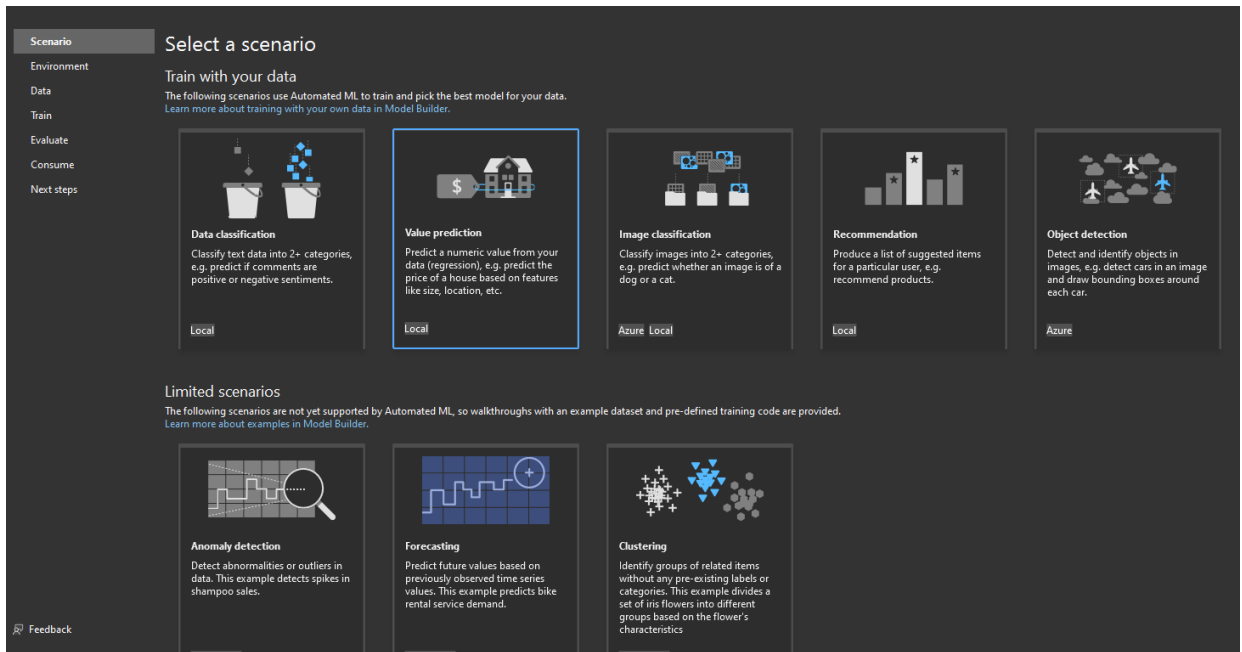
Figure 5.3.5.3 – Scenario selection for machine learning

For our system, we had selected price prediction for our machine learning. So, during the scenario selection, we need to choose the scenario that we are going to used which is the values prediction.
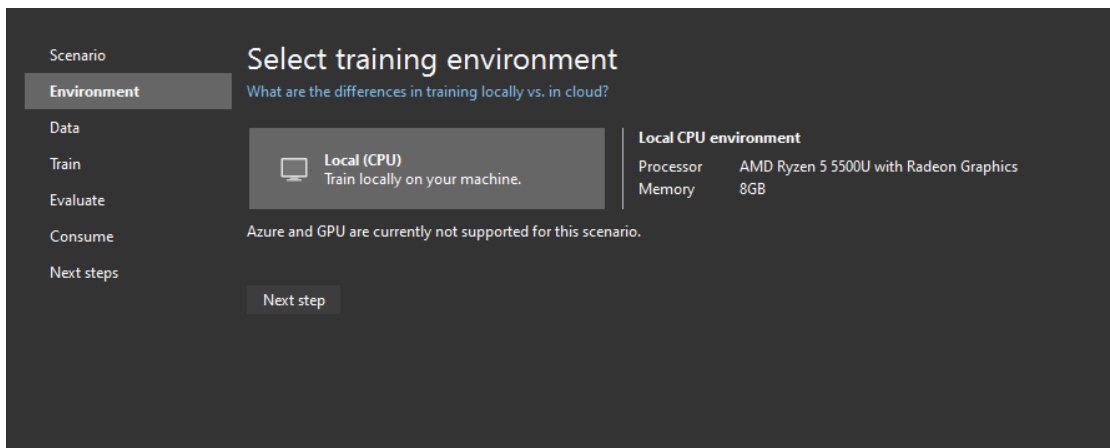
Figure 5.3.5.4 – Enviroment selection for machine learning

After selecting the scenario we need to select the environment. As we can see we have selected the local environment.
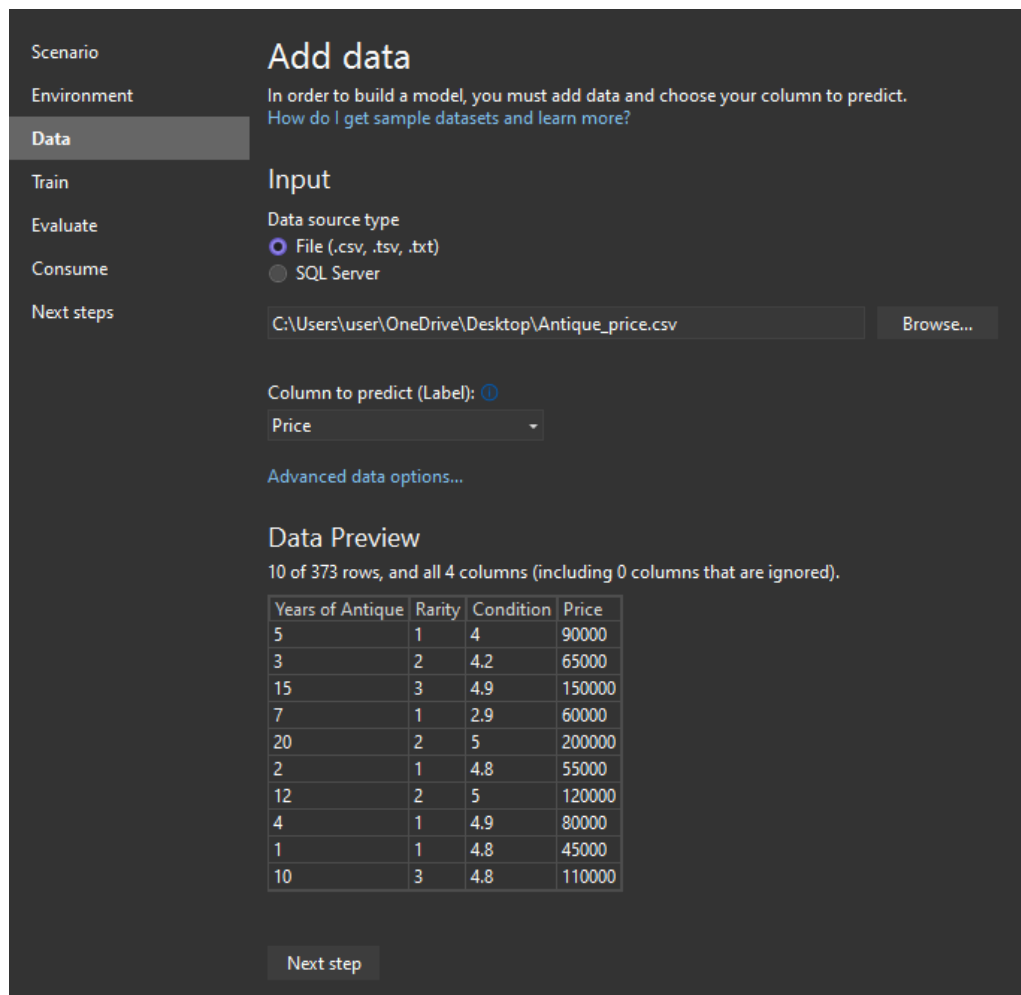
Figure 5.3.5.5 – Data selection for Machine Learning

After selecting the environment, we will proceed to the data selection. In this section, we need to prepare data that are relevant on the data that we wish to predict. For our system had selected data that contain the year of antique, rarity, condition and also the price. Then we need to select the column that we wish to predict which we can see on the figure above we had selected the price column to be predict.
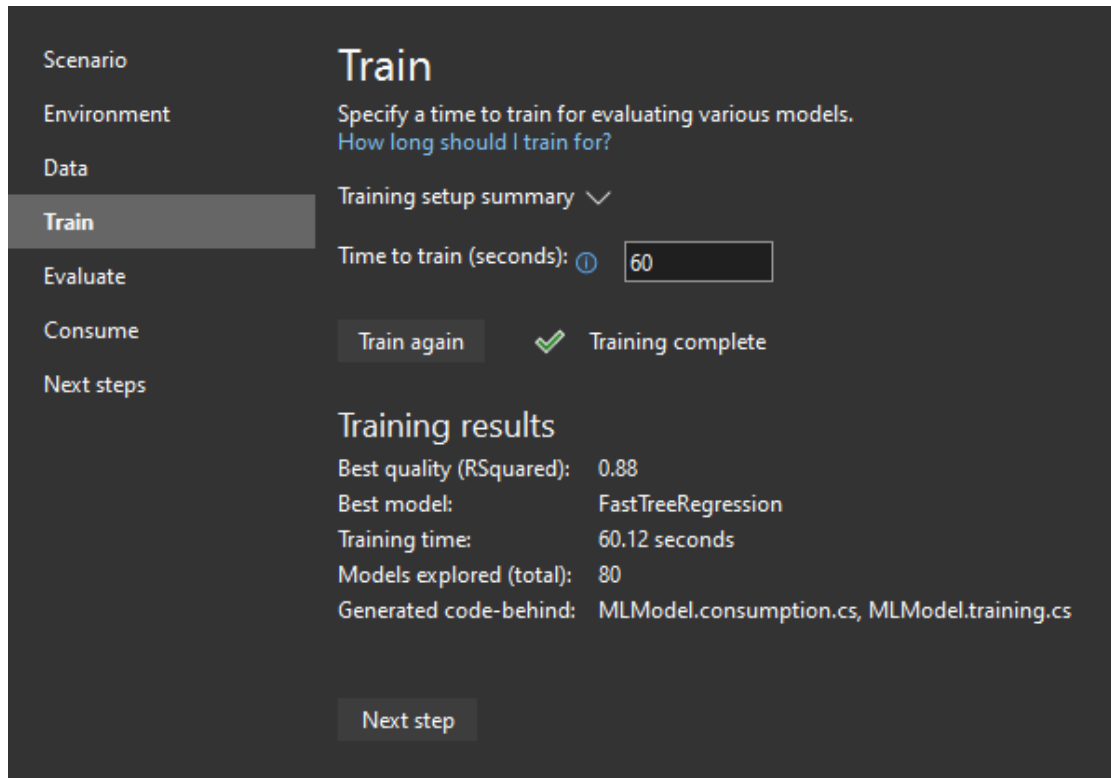
Figure 5.3.5.6 – Data training for machine learning

After we select the data, we will proceed to data training which the system will help us to train the data for evaluating various model. Before we train, we need to insert the time that is required to train based on the size of our file so that the system can find the best model for us. As we can see after training for 60 second the system had output the tranning result for us which the Rsquare we can see is 0.88, the best model is FastTreeRegression. These models will be used later on, on our prediction in our system.

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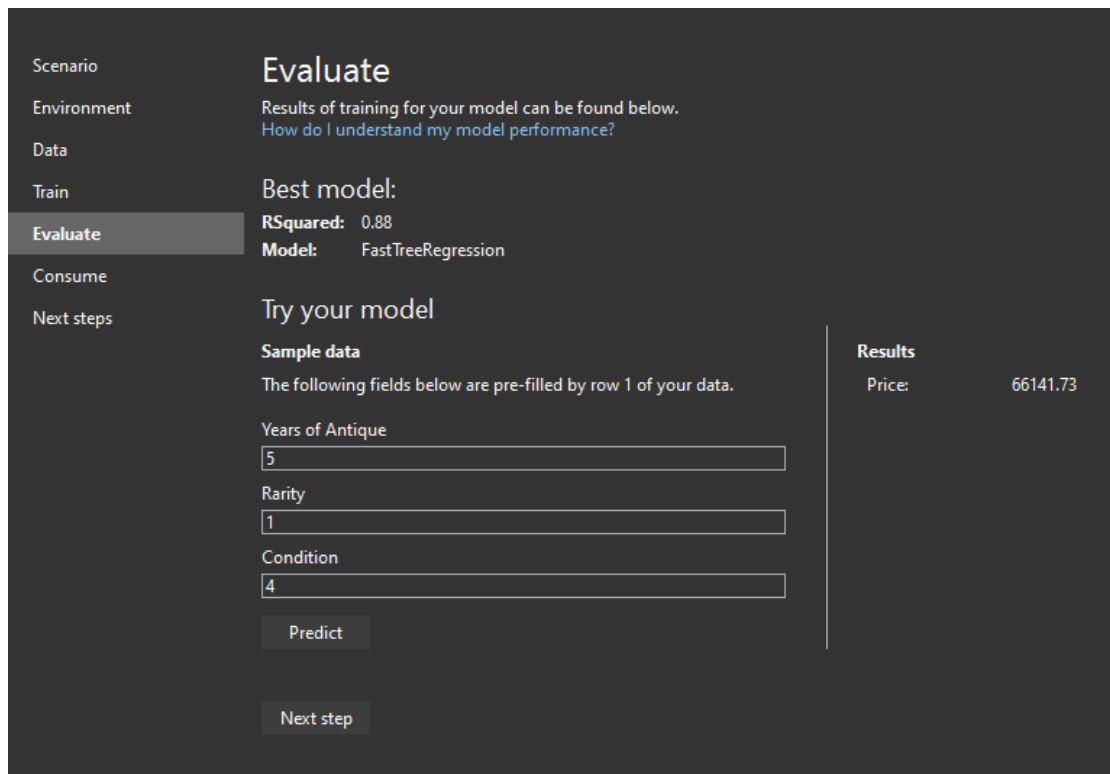
Figure 5.3.5.7 – Evaluate in Machine learning

Based on the figure above, after we done training, we will procced to the evaluation steps that allow us to evaluate our model by predicting some actual values based on the model that we had created. As we can see after we input the following data, the system will be able to predict the price of the product based on the model that we had generate.
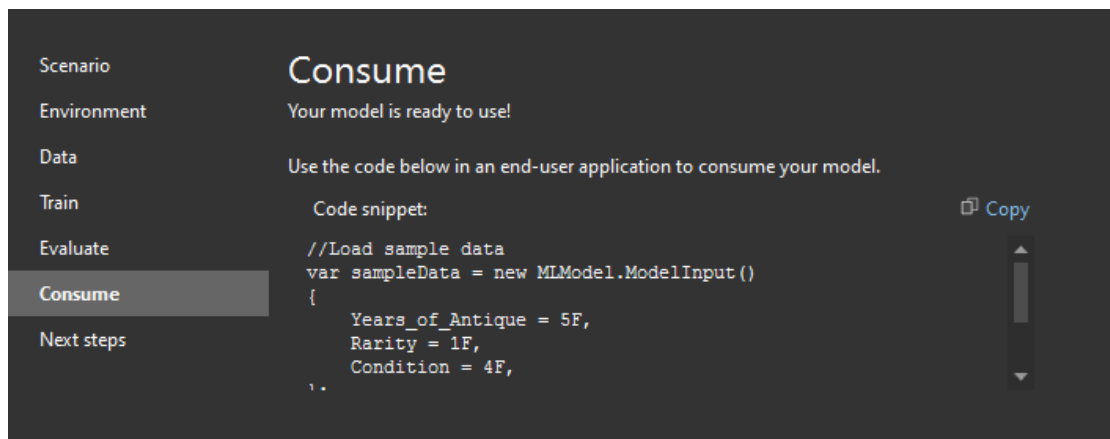
Figure 5.3.5.8 – Consume in Machine Learning

Coming to the last step, after all the previous step have done , we will be able to inplement the machine learning into our system by copying the code that the system had generate for us. We will be using this code in our controller which we can see on

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the figure below. By using the code snippest, when we want to predict price for our product, what we need to do is just post all the relevant data into the price prediction controller and then it will predict the price automatically and return a value to the user.

Figure 5.3.5.9 priceprediction controller

Figure 5.3.5.10 priceprediction code snippets

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5.4 System Operation

5.4.1 System operation for User Module

In this section, we will be discussing about the system operation of the user which is the action that can be done by the user. When the user first browser the website all the user will be redirect to this webpage first. As we can see the user haven't log in to the website.
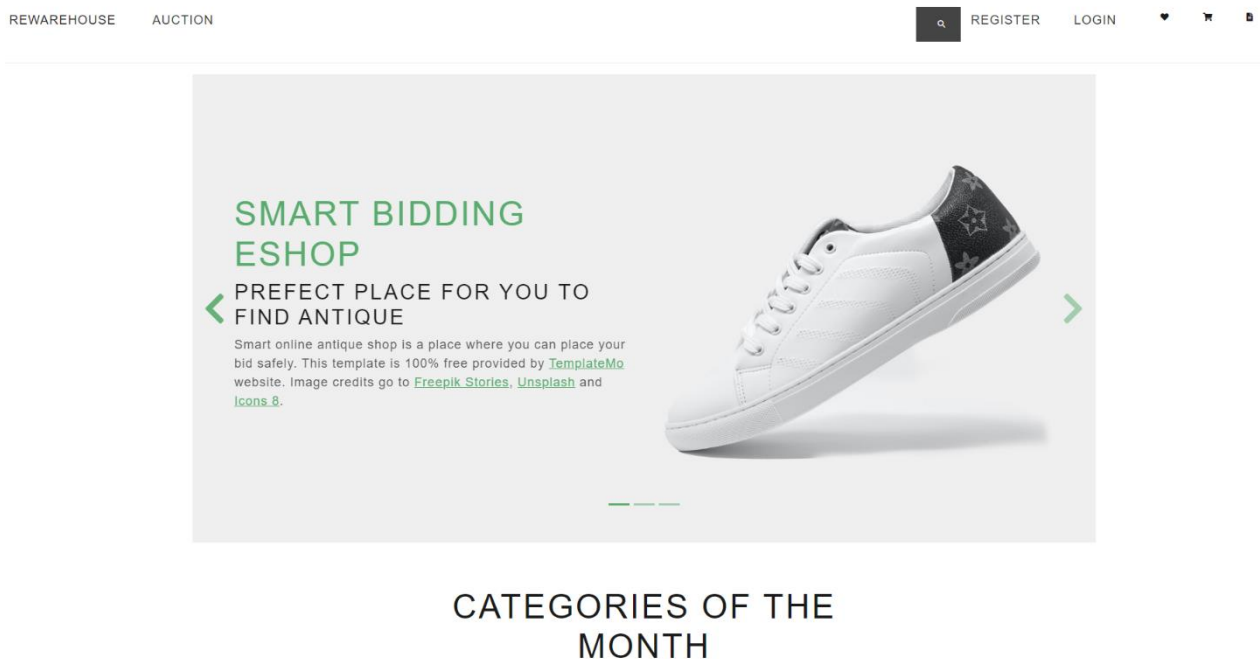
Figure 5.4.1.1-Index page

Without logging in the user will be able to browser the auction product on the auction page also as show on the figure below. If the user wishes to view the item on the cart, favorite list or the order the user will need to login to their respective account to view all the respective information. Besides, if the user is interested on the product that is shown on the auction page it also require the user to login into their respective account.
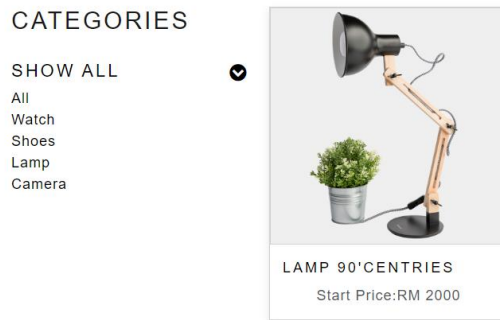
Figure 5.4.1.2-Auction Product page

If the user is a new user which does not have any existing account on the system before the user then need to register a new account by filling the information that is required shown on the figure below.
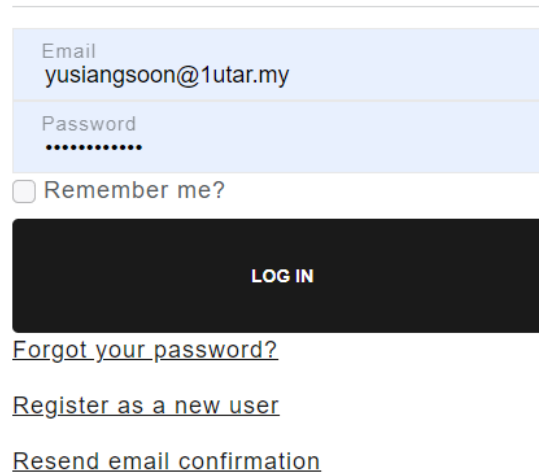
Figure 5.4.1.3-register page

If the user had an existing account on the system the user can choose to login to the account that belong to the user on the login page.
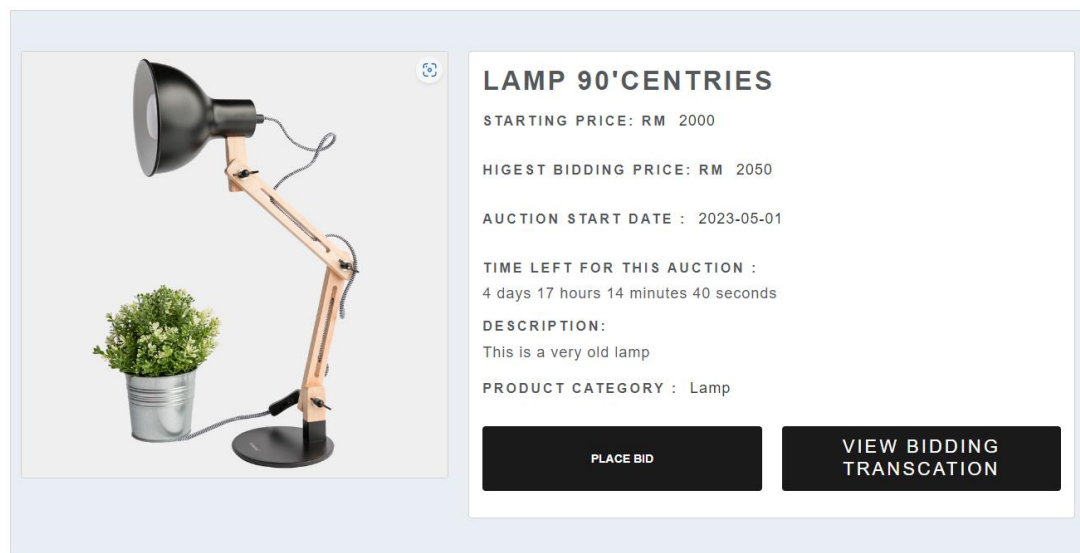
Figure 5.4.1.4-Login page

After logging into the user account the user will be able to view all the detail of the product as shown on the figure below.

Figure 5.4.1.5-Auction product details page

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After viewing all the detail of the product, if the user interested on the product the user can place bid on the product as shown on the figure below. The bid must be placed larger than the current bid amount. After placing the bid the amount that the user bid will be store into the system database.
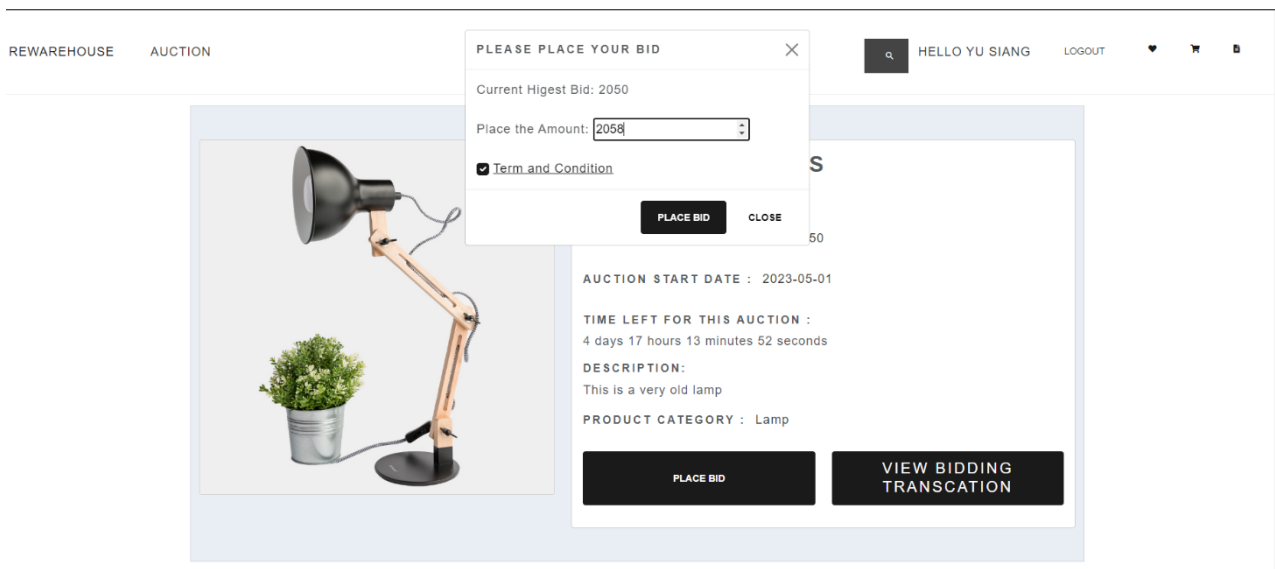

Figure 5.4.1.6-User placing bid on product.

Then the current bidding price will be update from time to time when the user place bid. For example in the figure above after the user place the bid for 2058 ringgit, the highest bidding price will be update to that number as we can see from the figure below.
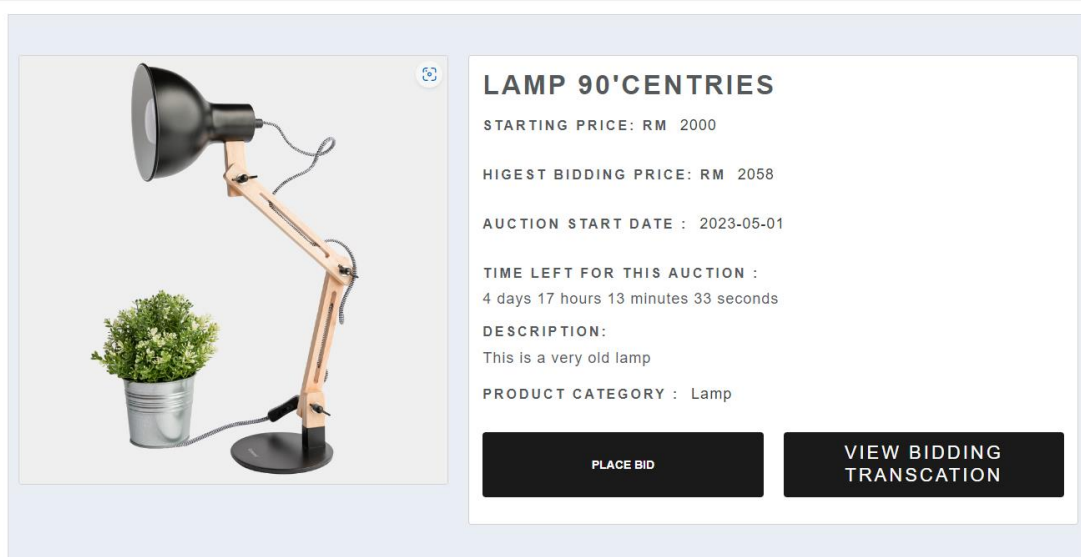

Figure 5.4.1.7-Figure showing highest bid after the user place bid

After placing the bid if the user wish to check the transaction that the user had made, the user can check it by clicking button on the product details page. Then the user will be redirect to the bidding transaction page as shown on the figure below.
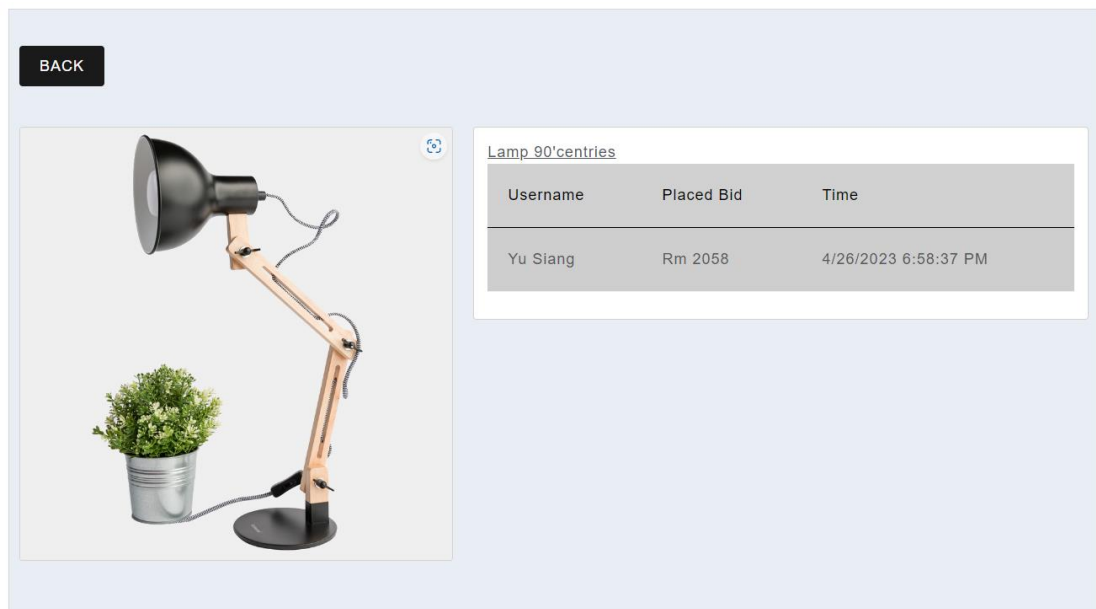

Figure 5.4.1.8-Transcation bidding page

Other than that, if the user is interested on the product and wish to save the information of the product temporary, the user can do so by clicking the love button on the product and all the information of the product will be store in the wish list.

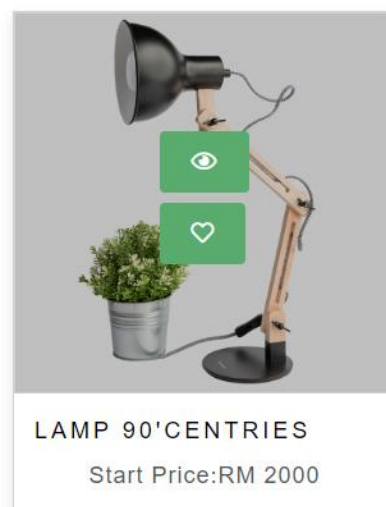Figure 5.4.1.9-Auction product page

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As we can see the product on the figure above is store inside the wish list. If the user wish to remove the product the user can do so by clicking the delete button on the product and the product will be remove from the wish list.
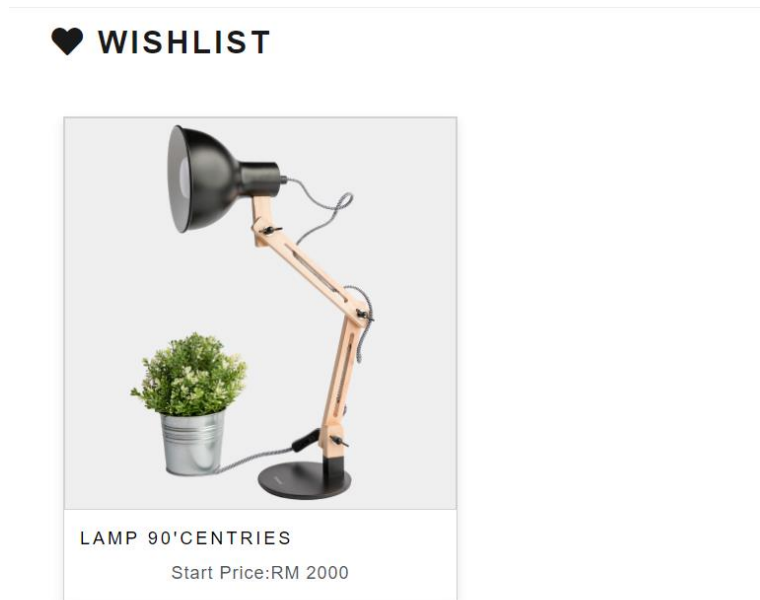

Figure 5.4.1.10-wishlist page

Beside wish list, there is also a live bidding cart which store the information of the product that the user bid on the auction that is ongoing. By having this live bidding cart the user will be able to track all product that the user is bidding easily as shown on the figure below.
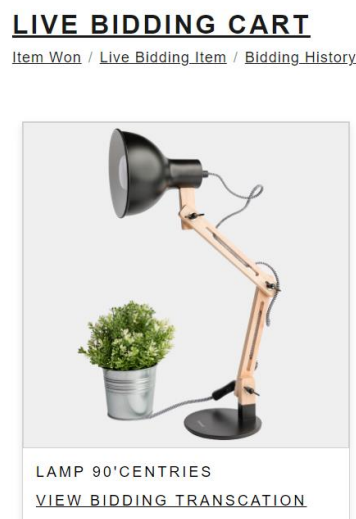

Figure 5.4.1.11-Live bidding cart page

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On the product page, there will be a count down clock counting the time of the auction. Once the time of the auction has ended, there will be message displaying on the page informing the user that the auction has ended. Then the winner of the product will be store into the database. At the same time, all the user will not be able to bid for the product once the auction time have ended.
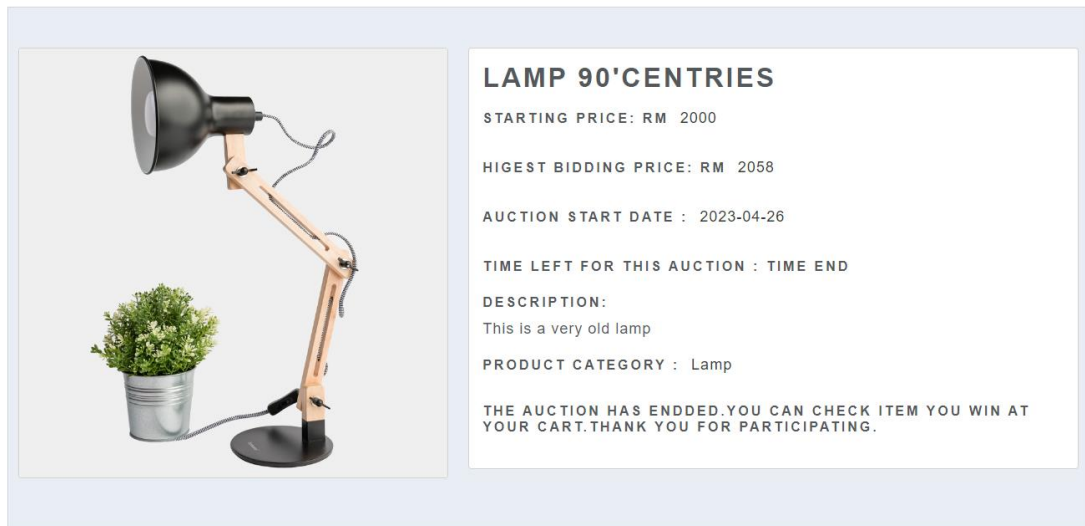

Figure 5.4.1.12- Auction product ended page

Once the time of the auction had ended for the product, at the bidding history all the user will be able to see the product that the user had bid before and also the price that the user had place no matter the user win the product or not.

Figure 5.4.1.13-Bidding History page

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If the user had won the product, the user will be able to see the product appear in the item won cart. Only the user who win the product with the highest bid will be able to see the item appearing on the cart.
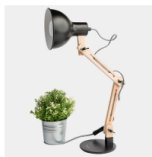

Figure 5.4.1.14-Item won page

After winning the product, the user will be able to proceed to the payment by filling up all the information that is required by the system as shown on the figure below.

Figure 5.4.1.15-Payment Form Page

As we can see after filling up the payment form, if the user click the pay with card button, the user will be prompt with a popup which require the user to enter the information of the card that the user wish to used to pay for the item. After filling up all the information the user will be able to make payment for the product based on the highest bid that the user had placed for that product .
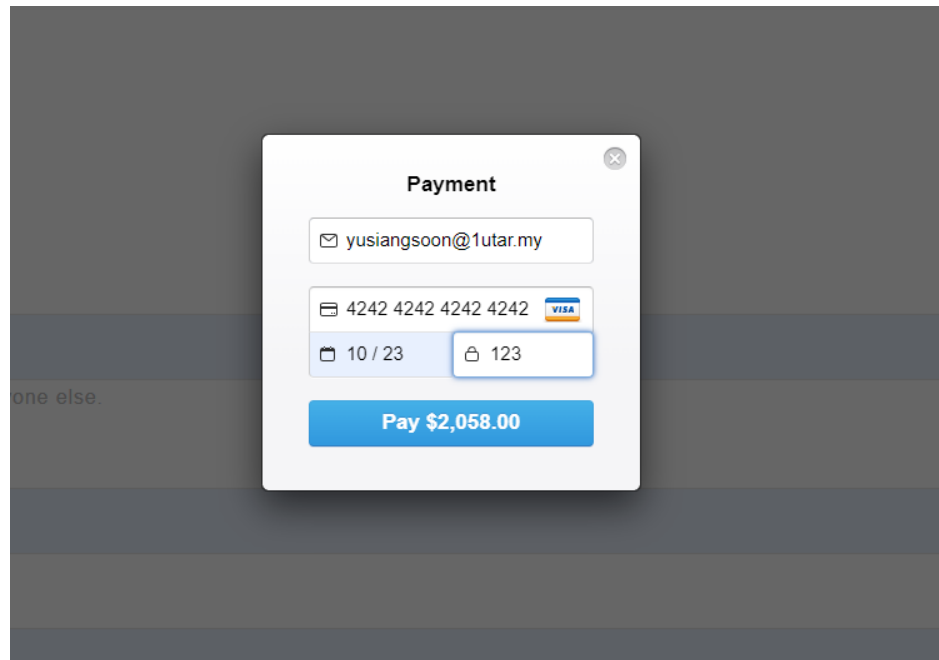
Figure 5.4.1.16-Payment form page with credit card payment

After the payment is made , the order of that product will be generated and store into the database. Then the user will be redirect to the order page and the product that the user had paid will be shown there as shown on the figure below.

Figure 5.4.1.17-Order Page

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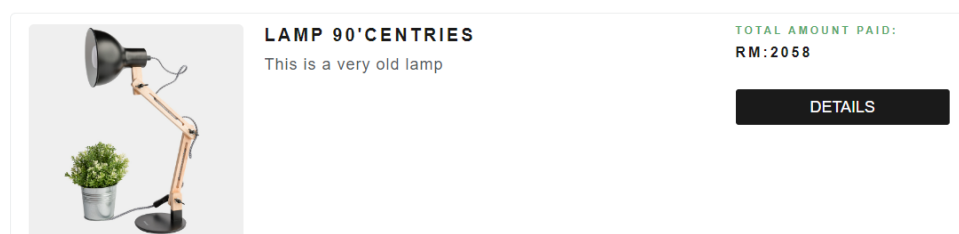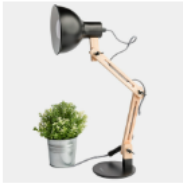
Lastly, if the user wish to view the details of that order the user can click the details button shown on the figure above. The user will be able to see the details of the product that the use bought as shown on the figure below.
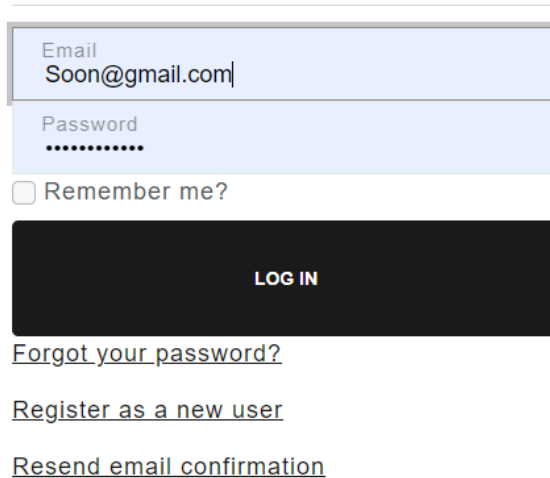
Figure 5.4.1.18-Order details page

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5.4.2 System Operation for admin Module

In this section, we will be discussing about the system operation for an admin. First of all as an admin we will be creating the account for an admin so that the admin can directly login to the admin account by using the login page shown on the figure below.

Figure 5.4.2.1-Login Page

After logging in to the admin account, the admin will be redirect to the index page as shown on the figure below. Then the admin can chose on the action that the admin wish to done that shown on the navigation bar.
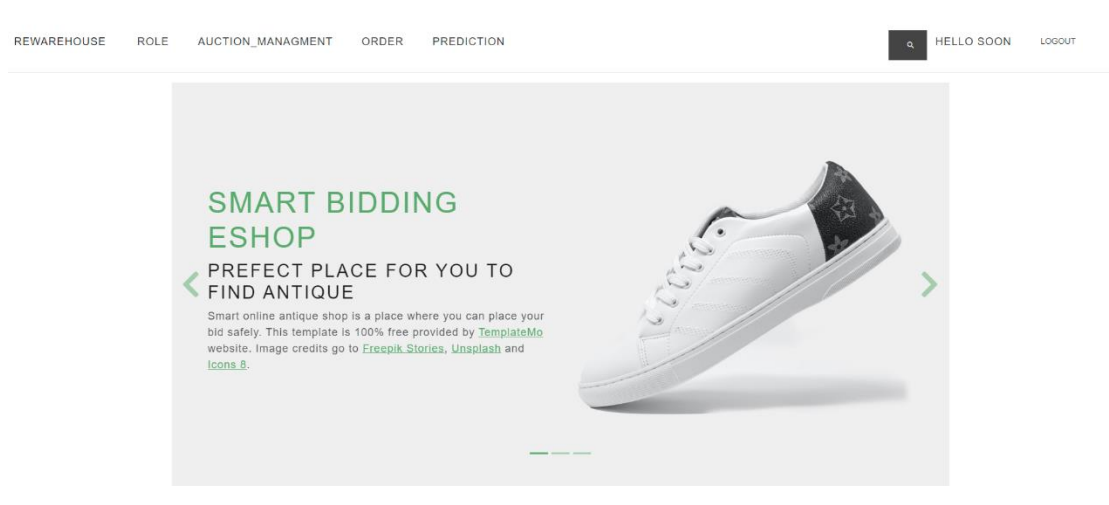
Figure 5.4.2.2-Index Page

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For admin, if the admin choose to manage the auction product, the admin will be redirect to the auction product management page where the admin can manage all the product as shown on the figure below. As we can see currently on the figure below there will be no product.
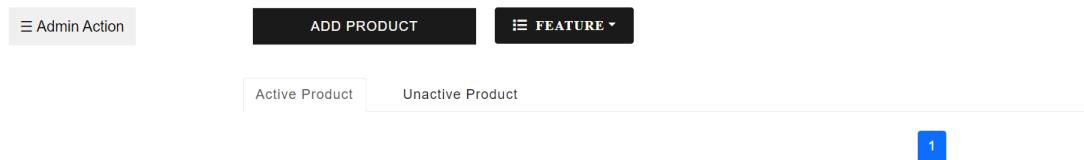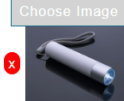
Figure 5.4.2.3-Auciton management page

If the admin click the add product button on the figure above the admin will be redirect to add product page where the admin need to fill in all the information of the product that the admin wish to sold. As we can see on the figure below, the admin had filled in all the relevant information of the product. Once the form is submitted, all the information will be store in the database.

Figure 5.4.2.4-Add product page

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 Then we will be able to view the product that we had added to the database in the auction product page as shown on the figure below.
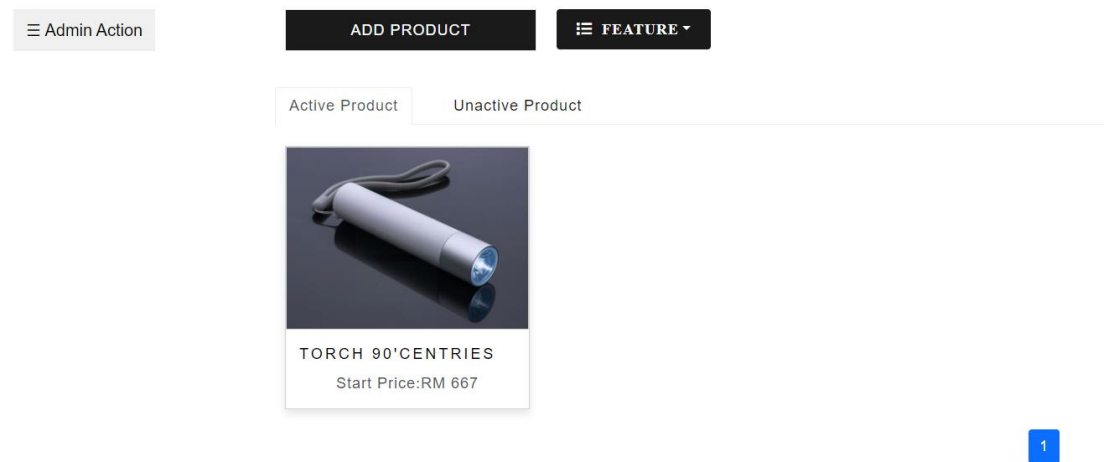
Figure 5.4.2.5-Product successfully added

Other then, viewing the product, as we can see on the figure below. On the auction management page, the admin will be able to use the feature such as the list view, grid view which is the view that are currently being seen on the figure below. Besides, the admin also can choose to sort the product based on the starting price of the product which all of the feature will be shown below.
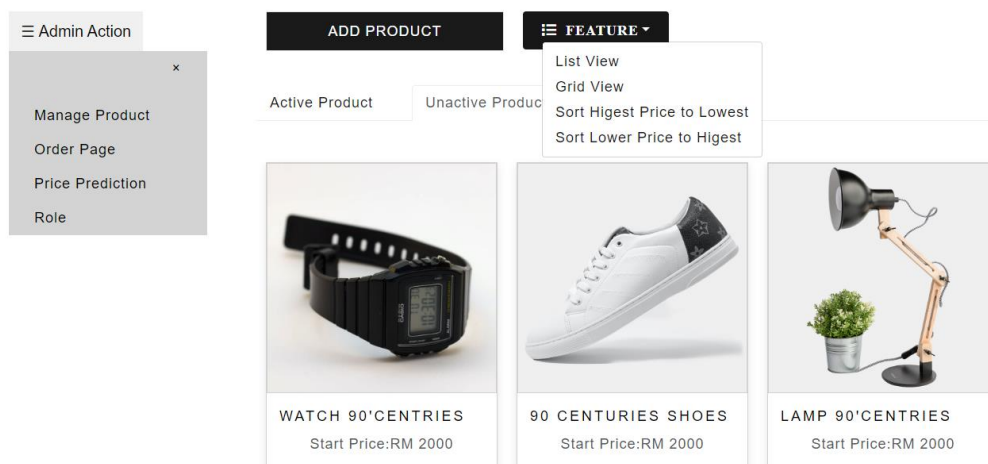
Figure 5.4.2.6-Feature selection

List view being shown on the figure below.
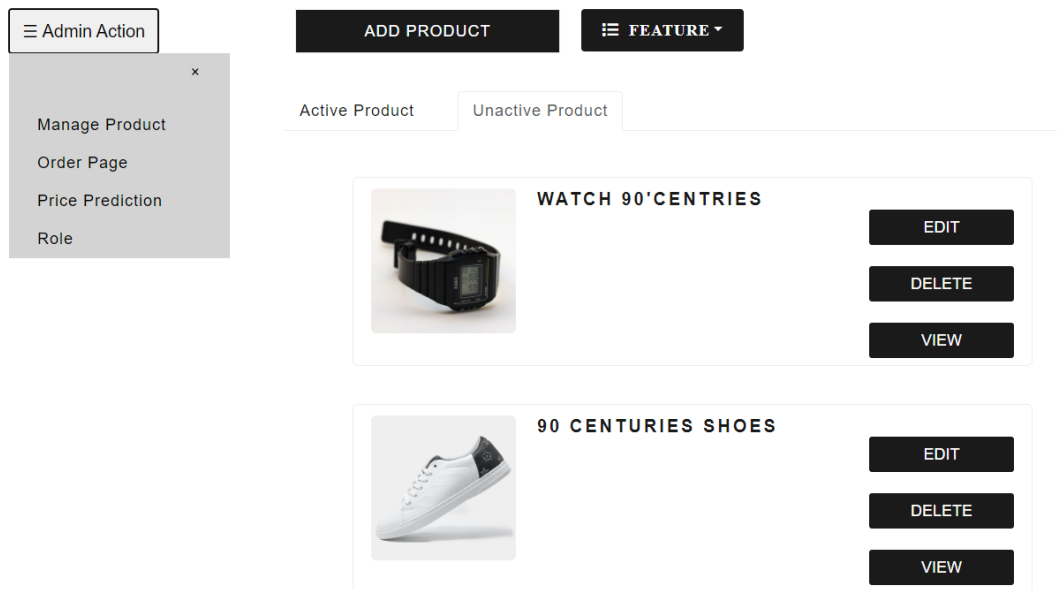
Figure 5.4.2.7-List view selection

As we can see on the figure below all the starting price being sort from the lowest to the highest.
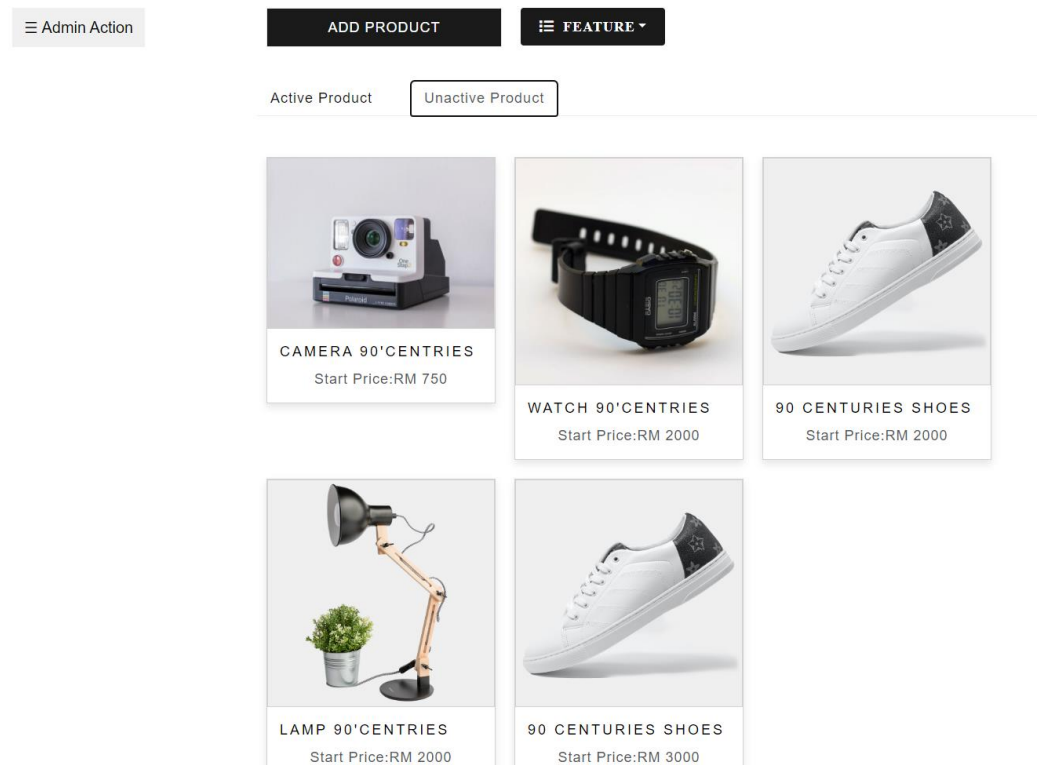
Figure 5.4.2.8-Starting price sort from lowest to highest

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Besides adding product, the admin can also delete the product that the admin desire. As we can see on the figure below we have five product initially. When the admin click the delete button on the product that he or she wish to delete the system will redirect the admin to a confirmations page which is shown on the figure 222 below asking the admin whether to delete the product or not.
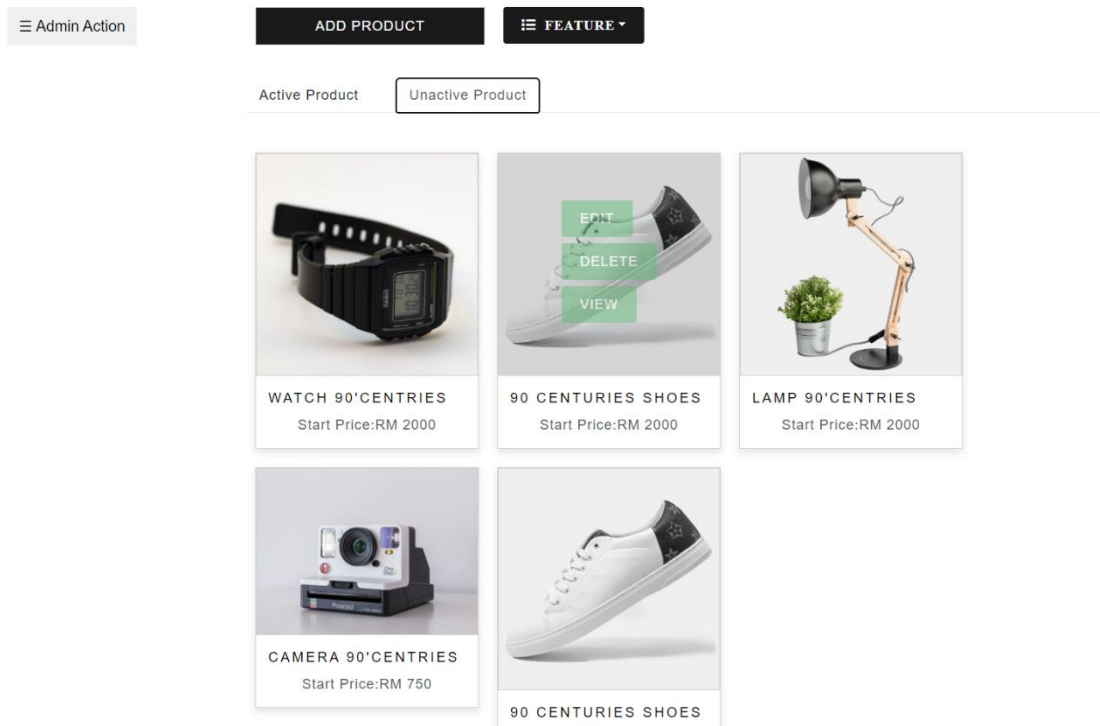
Figure 5.4.2.9-Auction Product page before product deleted

Figure 5.4.2.10-Confrimation page deleting product

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Once the product is deleted, the product will be remove from the database and we will be able to see the result on the figure below which we can see that originally five product were left with four product.
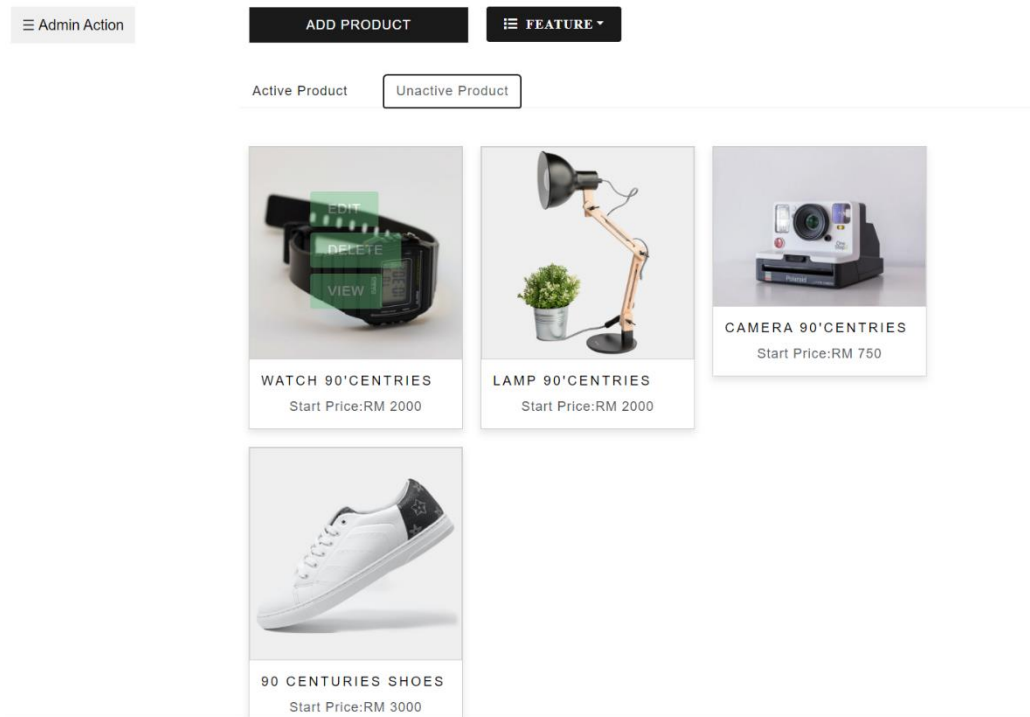
Figure 5.4.2.11-Auction Product page after product deleted

The admin also can perform editing function on the product that the admin wish to change. For example on the figure below, the if the admin wish to change the name of the torch from Torch 90'centries Colombia to Torch 90'centries the admin need to fill in a form generate by the system shown on the figure 333 below.
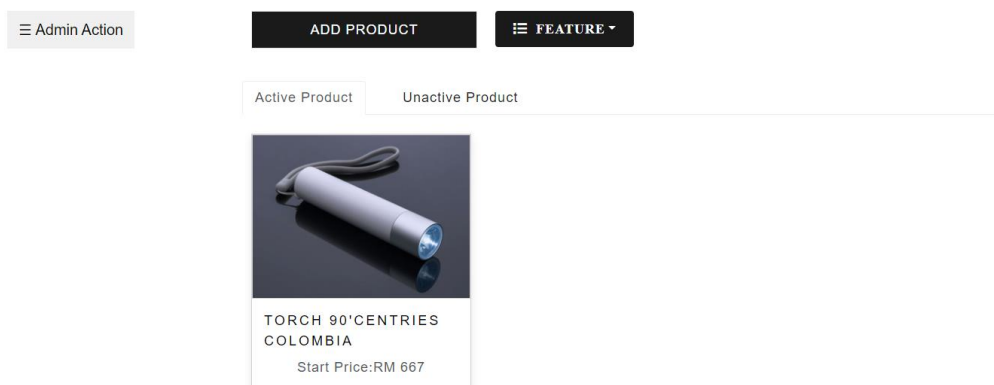
Figure 5.4.2.12- Auction product page before product name edited

Product Name

Torch 90'centries

Product Id

0

Category

Torch

Default file input example

Choose Image

Product Start Price

667

Figure 5.4.2.13-Product editing form

As we can see, after changing the name the system will then update the database and result of the name changing will be shown on figure below.

≡ Admin Action   ADD PRODUCT   ≣ FEATURE ▾

Active Product   Unactive Product

TORCH 90'CENTRIES
Start Price:RM 667

1
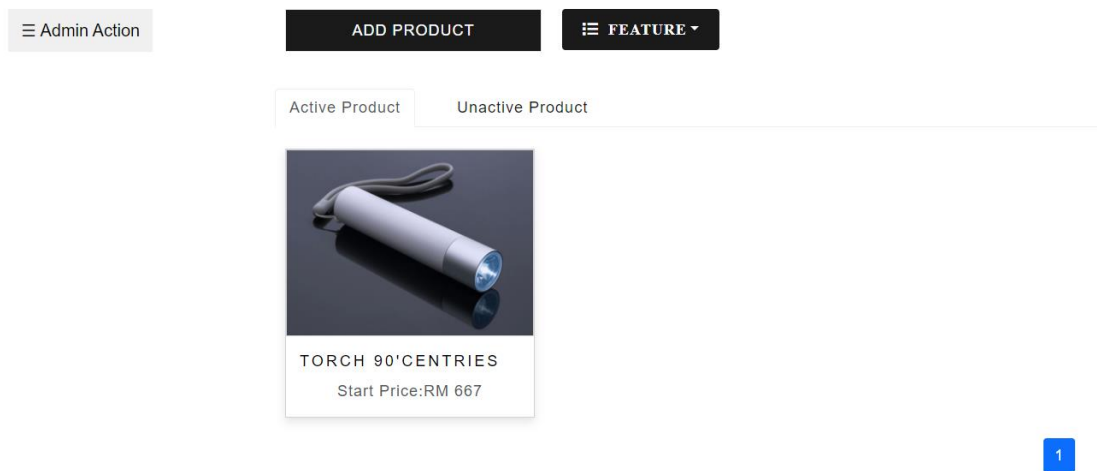
Figure 5.4.2.14- Auction product page after product name edited

Beside managing the auction product, the admin can also have an overview on the product that is currently bidding or the bidding has ended. As we can see on the figure below, the admin can choose to view bidder, which all the bidder whoever place bid before on the product will the shown on that page. The admin also can view the information of the winner that won the product by clicking the view winner button on the figure below.
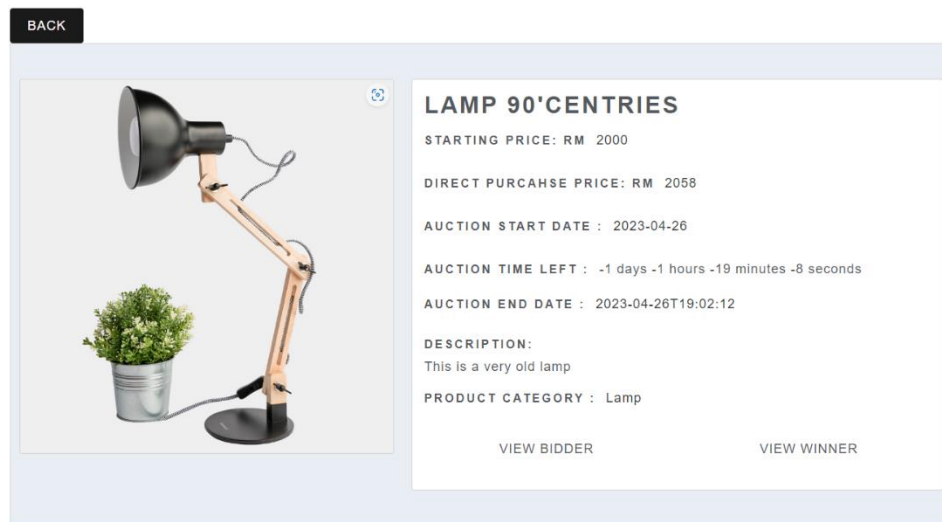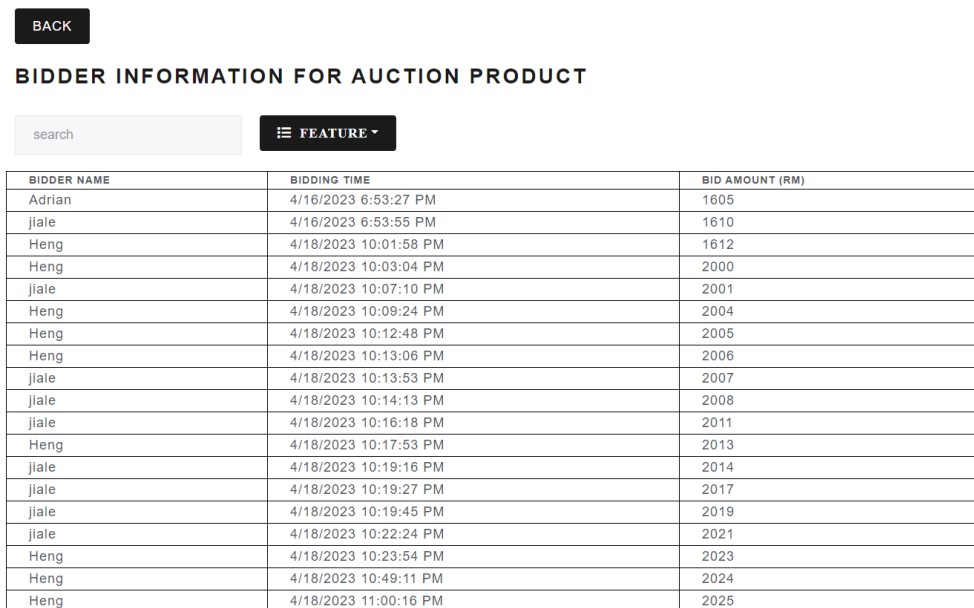
Figure 5.4.2.15-Product Details page
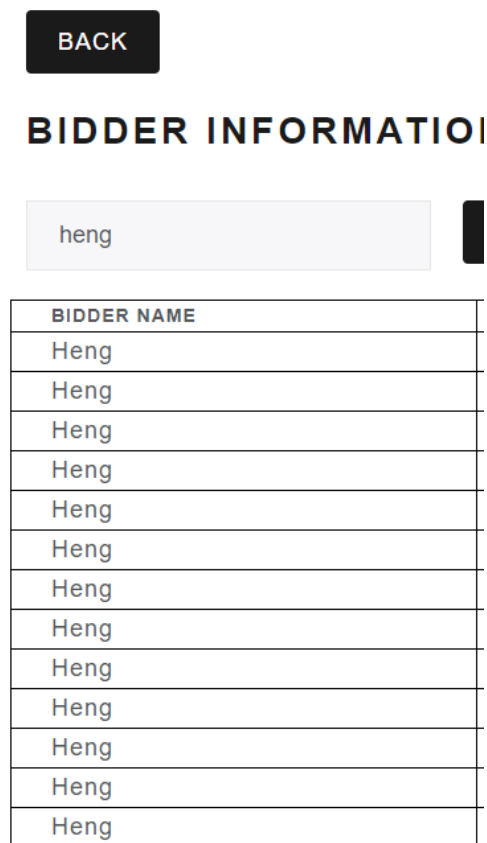
Once the view bidder button is clicked, the system will show a list about the information of the bidder that place bid for that particular item in a page as shown on the figure below.

Figure 5.4.2.16-Bidder transaction page

Other than viewing all those information, the admin can also search for the name of that bidder to view all the transcation that had been done by that particular user and the system will return a list based on the search item by the admin as we can see on figure below.

Figure 5.4.2.17- Bidding transaction page after search function perform

Beside searching the admin can also use the feature such as sorting the amount of the bidding number from small to large, or large to small as we can see on figure below, the number of the bid amount is being sort from large to small.

Figure 5.4.2.18-Bidding transaction page after sort function perform

On the figure below show the information of the winner on that particular product when the admin click the view winner button on the product details page.
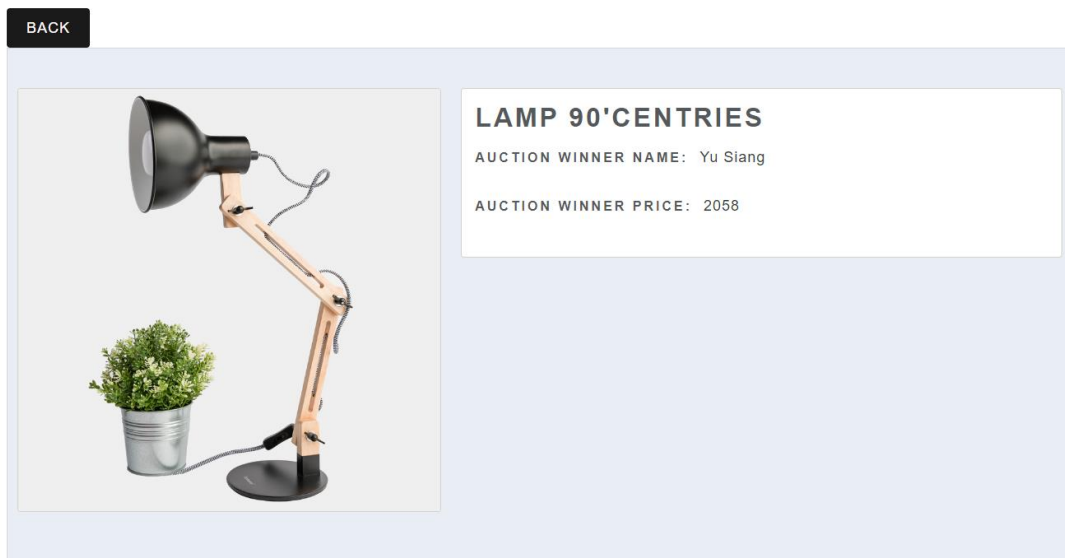
Figure 5.4.2.19-Auction Winner page

When the user had made payment on the product that the user had sucessfully bid, the admin will recive the order and the admin can check for the order on the order page. From the figure below show the order page which we can see that the product status is being shipped. From the order page, it allow the admin to deal with status of the order by updating the status order so that the user will be able to receive and also track their product.
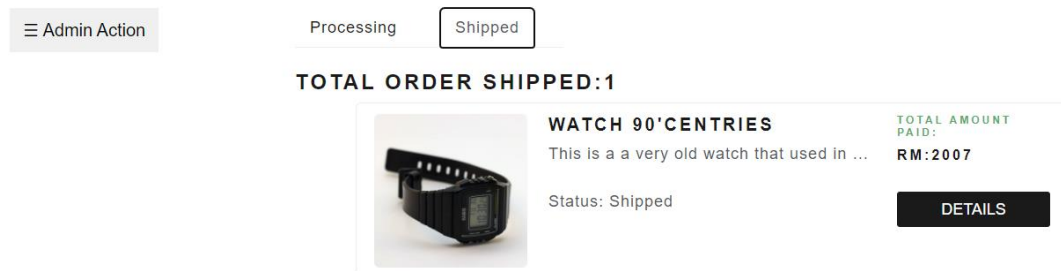
Figure 5.4.2.20-Order page

From the figure below, we can see that currently there is two product which the status are still in processig but once the admin had comfrim the shipment of that product the product will be place in the shipped category and the status will also be change from processing to shipped.
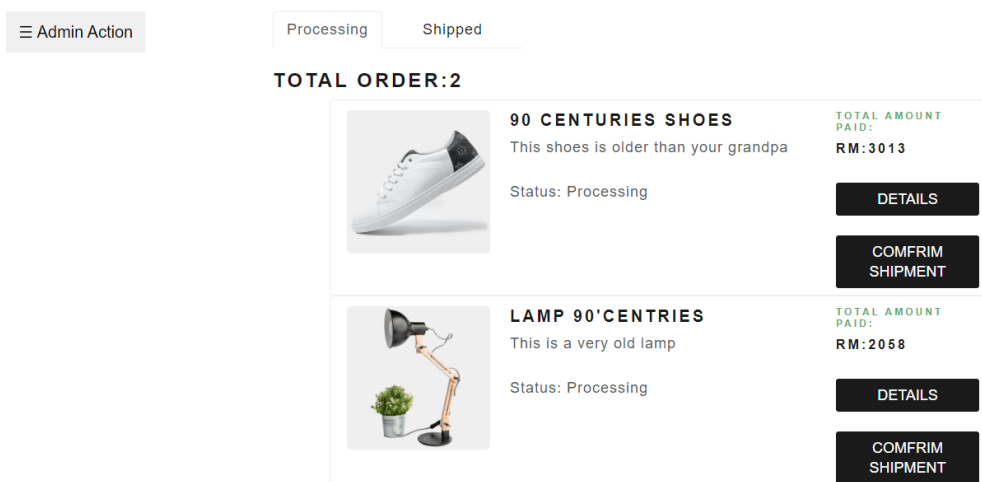
Figure 5.4.2.21-Order page showing product in processing status

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On figure below we can see that the shoes are being placed under the shipped category after the admin had comfirm the shipment.
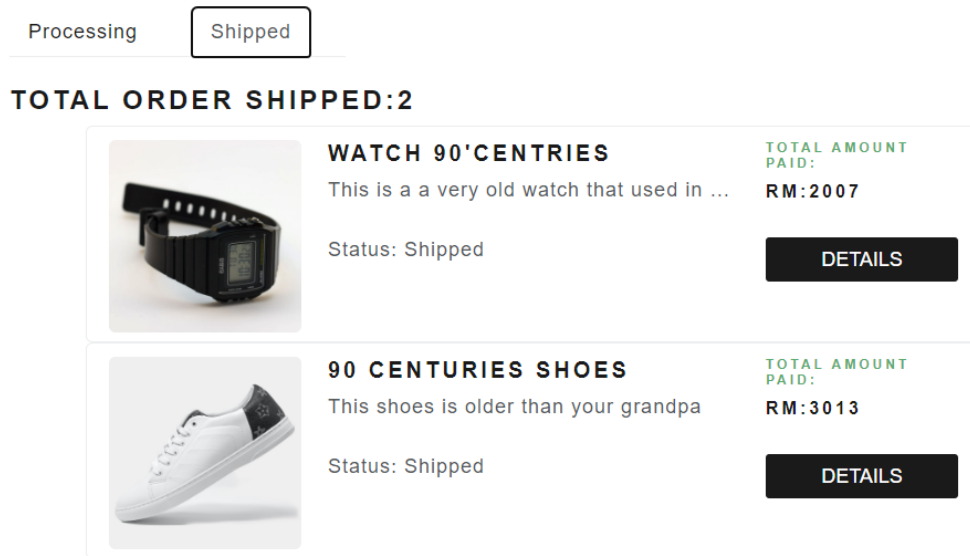
Figure 5.4.2.22-Order page showing product in shipped status

If the admin wish to see the detail of the order the admin can click the details button and the system will redirect the admin to a more details view of the order which we can see on the figure below.
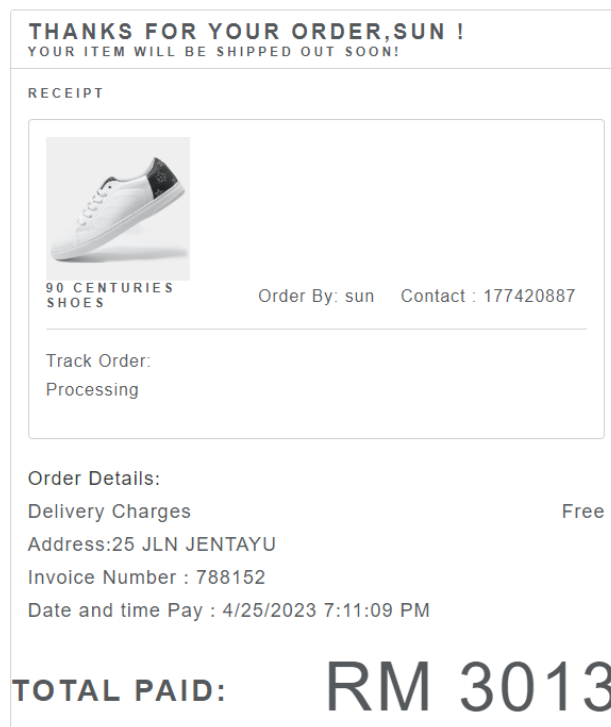
Figure 5.4.2.23-Order detail page

Furthermore, the system also had implement a price prediction algorithm that can help the admin to predict the price based on some of the attribute of the antique product such as the year of the antique, rarity of the antique and also the condition of the antique. From the figure below we can see that the admin had fill in the all the relevant information.
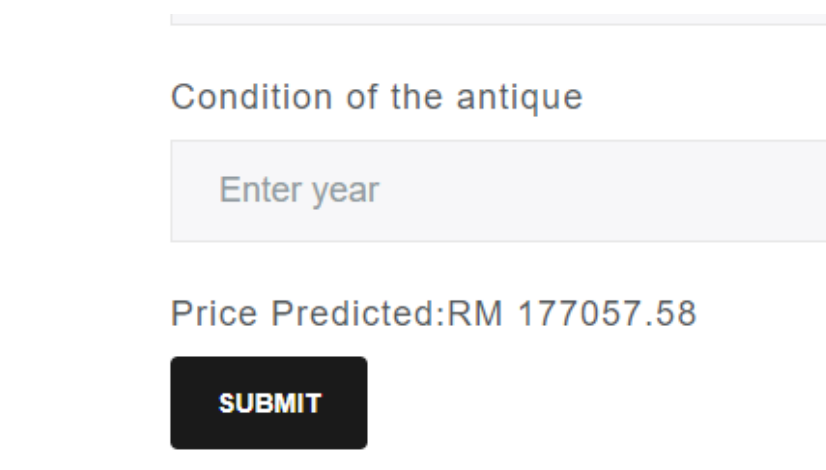
Figure 5.4.2.24-Price prediction form

After the submit button is pressed, the system will pass the data to the server and make prediction based on the information that the admin had input. The machine learning algorithm that we had develop before will generate the prediction on the server and then return a values for the admin. This values can used by the admin to place for the price of the antique or also help the admin to have a better insight on the price of that antique. From the figure below, we can see the price that being predicted.

Figure 5.4.2.25-Price prediction output result

5.5 Implementation Issues and Challenges

During the implementation there are some problems faced. The first problem faced is the unfamiliar usage of the software tool. For this project, this is the first time we use visual studio code to develop a website. From the experience, we do not have any experience on using visual studio code which lead to the challenge on the understanding the language and also how to code using the languages. Throughout the project, we have integrate ASP.Net to develop our website which appear to be a new technology for our project. We need to spend time understand how the framework works and also the way that how this ASP.NET integrate with the database. Other than that, when implementing the machine learning it is also a quite challenging task. By choosing using which platform to deploy the machine learning is one of the biggest challenges. Beside that, finding suitable data for the machine learning to predict the item is also one of the challenges that we faced.

Chapter 6

System Evaluation And Discussion

6.1 System Testing, Testing setup and Result

1) Testing on Admin Management Module

Test Plan 1:

Table 6.1.1-Verification and testing plan for TC_OTPM_01

Project Name	Smart Bidding Modern antique EShop
Module Name	Admin Product Management Module
Reference Document	Admin controller, admin view
Date of Creation	27/4/2023
Date of Review	27/4/2023
Test Case ID	TC_ADMIN_01
Test Scenario	To verify that the admin able to perform all the management function on the auction product successfully such as add product, edit product and also delete product.
Test Case Description	This test case is to test all the management function on the auction product and make sure that all the management function can be perform successfully.
Pre-condition	Add Product function

	• Admin is logon into the system and the admin must be in the auction management page. • Then the admin need to fill in all the information of the product in the add product form. Edit Product Function • The admin must be logging in on the system • There must be an existing product on the system before the admin perform this function Delete Product Function • The admin must be logon in the system • There must be an existing product on the system before the admin perform this function.
Expected Result	Add Product Function • All the information of the product can be added successfully to the database. At the same time the product can be shown on the auction management page. Edit Product Function • The information that the admin wish to change will be able to change and display correctly. Delete Product Function • The information that the admi wish to delete can be deleted correctly and all the information will be remove from the database.
Actual Result	Add Product Function • The system will be able to add all the information that is being fill in by the admin accurately into the database and display all the information correctly. Edit Product Function • The information that the admin had made changes will be change accordingly correctly

	Delete Product Function • The right product will be deleted and removed from the database.
Test Result	PASSED
Test Step:	Add Product Function • Admin need to press the add product button on the auction management page • Then the admin will be required to fill in a form which contain all the information of the product that the admin wish to add. • After filling all the information the admin shall submit the form by clicking the submit button, Edit Product Function • Admin need to press the edit button that stay along with the product that the admin wish to edit. • Then the admin will be require to make changes by changing the information that the admin wish which all of the information will be display in a form. • After changing all the information, the admin shall submit the form back to the server by clicking the submit button. Delete Product Function • The admin need to press the delete button that stay along with the product that the admin wish to delete. • Then the admin will be prompt with a confirmation form that contain all the information that the admin wish to delete. • By submitting the form, the relevant product will be deleted.
Test data	Add Product Function • All the relevant information of the product such as the name of the product, price of the product, image of the product etc.

	Edit Product Function
	• The relevant information that the admin wishes to change such as the name of the product.
	Delete Product Function
	• The product id of that relevant product.

Test Result for Add product:
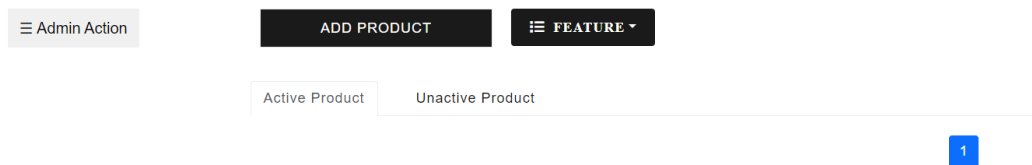
Figure 6.1.1- Auction Management Page with no product

Figure 6.1.2-Add Product Form

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Figure 6.1.3-Auction Management Page with product added

Test Result for edit product:

Figure 6.1.4-Test Result for edit Product

Delete product Test result:
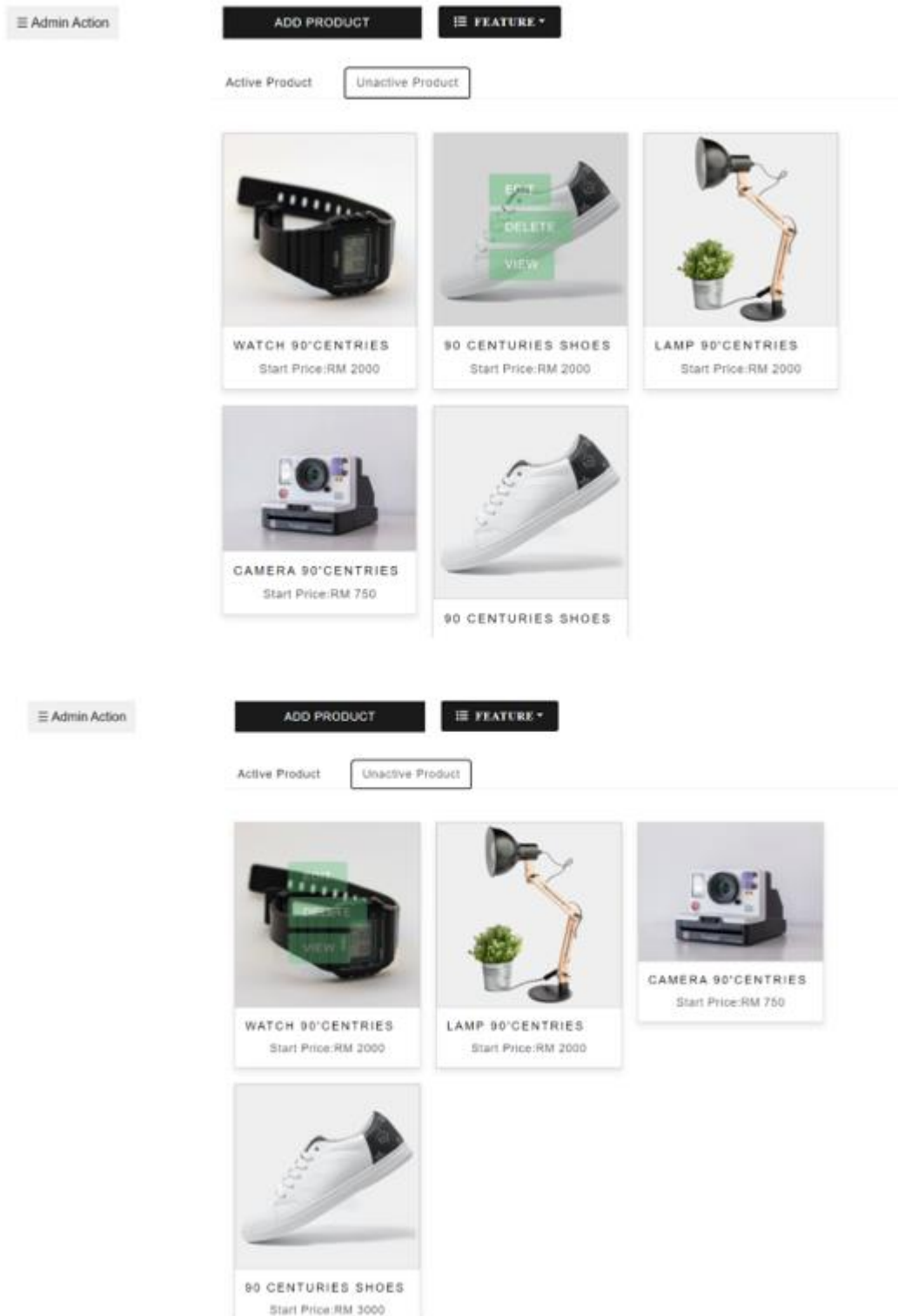
Figure 6.1.5-Test Result for delete product

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Test Plan 2:

Table 6.1.2 Verification and testing plan for TC_OTPM_02

Project Name	Smart Bidding Modern antique EShop
Module Name	Admin Order Management Module
Reference Document	Admin controller, Admin view
Date of Creation	27/4/2023
Date of Review	27/4/2023
Test Case ID	TC_ADMIN_02
Test Scenario	To verify that the admin able to manage all the order that is generate by the user when the user made payment on the product that the user had won.
Test Case Description	This test case is created to test whether the admin can manage the order that is created by the user when the user made payment on the product.
Pre-condition	1. The admin must logon into the admin account 2. There must be product where the auction time. 3. When the auction time ended the user who win the product must made payment so that the order will be generated.
Expected Result	The order will be generated after the user had made payment for the product. At the same time, the admin can manage all the order by updating the status of the order.

Actual Result	The status of the order is being updated from processing to shipped. At the same time the product which the status being updated will be separated accordingly based on the product status.
Test Result	PASSED
Test Step:	1. Admin open the order page 2. Admin check whether there is product that the status is still in processing. 3. Then the admin can update the status by clicking the button "Confirm shipment"
Test Data	Order Id, Order status

Test Result on TC_ADMIN_02:

Figure 6.1.6-Test Result of TC_ADMIN_02

2) Testing on Admin Price Prediction

Test Plan 3:

Table 6.1.3 Verification and testing plan for TC_ADMIN_03

Project Name	Smart Bidding Modern antique EShop
Module Name	Admin Price Prediction Module
Reference Document	Admin Controller,Admin View
Date of Creation	27/4/2023
Date of Review	27/4/2023
Test Case ID	TC_ADMIN_03
Test Scenario	To test output of the price prediction machine learning.
Test Case Description	This test case is created to test whether price prediction machine learning will be able to predict the price on the antique based on the data that is being prepared.
Pre-condition	1. Admin Login to his or her respective account. 2. Admin visit to the price prediction page 3. Make sure that the model had being train before any prediction is made.
Expected Result	The system should predict a price based on the range of the data that we had prepared.

Actual Result	The system is able to predict the data which are closed to the range of the data that we had predicted.
Test Result	PASSED
Test Step:	1. Admin fill in the all the information that is needed for the price prediction. 2. Admin submit the form to the system by pressing the submit button on the price prediction page.
Test data	Information of the price prediction: Year of the antique, Rarity, Condition

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Test case for TC_ADMIN_03:

Please Fill in Your Details

Year of the antique

14

Rarity of the antique

3

Condition of the antique

4.0

Price Predicted:RM

SUBMIT

Price Predicted:RM 152877.47

Years o	Rarity	Conditi	Price
14	2	4.8	130000
14	2	4.1	115000
14	2	4.2	120000
14	2	4.1	100000
14	2	4.7	140000

Figure 6.1.7-Test Result for TC_ADMIN_03

3) User Bidding Process

Test case 4:

Table 6.1.4 Verification and testing plan for TC_USER_01

Project Name	Smart Bidding Modern antique EShop
Module Name	User Module
Reference Document	User Controller, User View
Date of Creation	27/4/2023
Date of Review	27/4/2023
Test Case ID	TC_USER_01
Test Scenario	To test the flow of the bidding process to see whether the user can successfully bid the product.
Test Case Description	This test case is created to test whether the bidding process can flow from the beginning to the end successfully so that the user can bid the product that they are interested.
Pre-condition	User Login to his or her respective account. 4. Users visit the product page that the user interested.
Expected Result	After the user place the bid for that item the amount that the user bid should be saved into the database. Besides, the highest bid on the product page should be updated and also the user will able to view the amount that the user place in the transaction page.

Actual Result	The system is able to save the amount that the user had place for that product and update all the information to the database. At the same time, the highest bid on the product page should be updated to the amount that the user bid.
Test Result	PASSED
Test Step:	3. User has clicked the button "Place Bid" on the product page 4. User fill in the amount that the user wish to place. 5. User need to agree to the term an condition before the user place the bid.
Test data	Amount place for the product.

Test result for TC_USER_01:
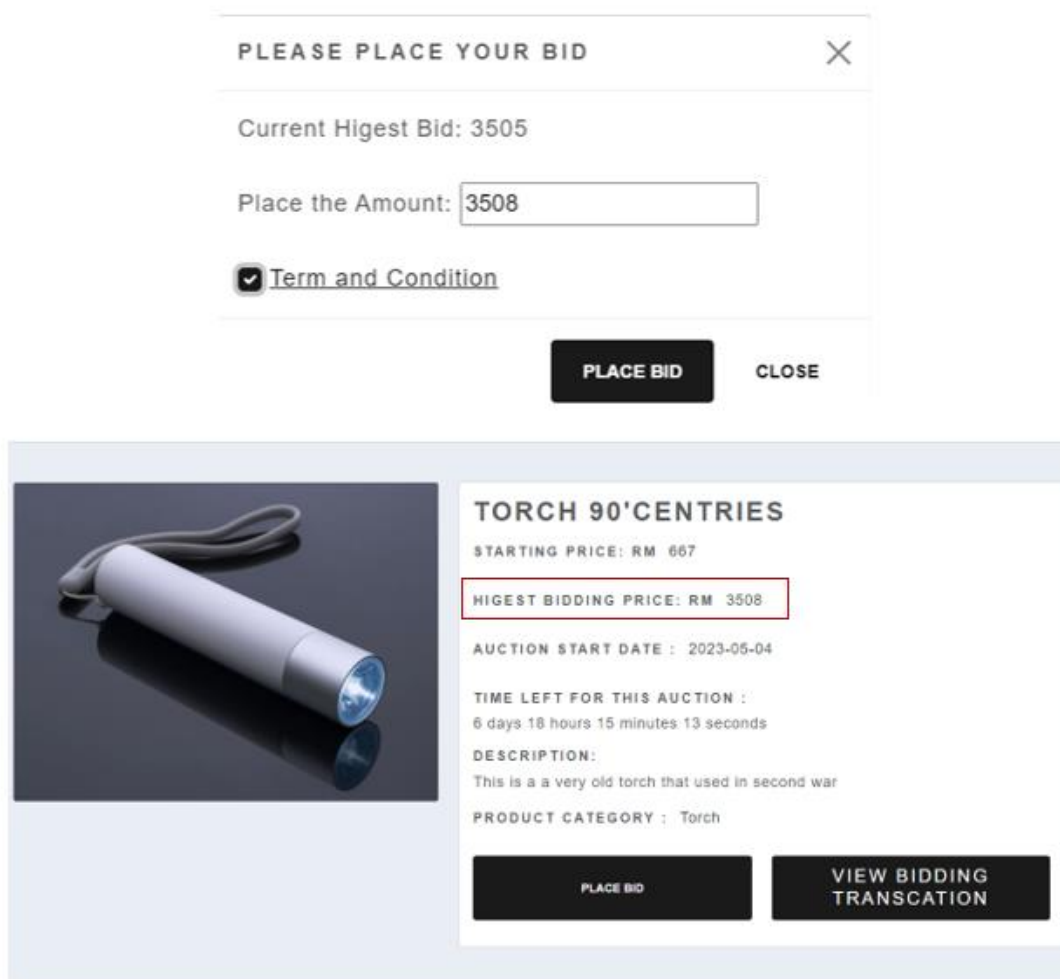
Figure 6.1.8-Test Result for TC_USER_01

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4) User Won Auction

Test case 5:

Table 6.1.5 Verification and testing plan for TC_USER_02

Project Name	Smart Bidding Modern antique EShop
Module Name	User Module
Reference Document	User Controller, User View
Date of Creation	27/4/2023
Date of Review	27/4/2023
Test Case ID	TC_USER_02
Test Scenario	To test user will be able to won the product once the auction time had ended.
Test Case Description	This test case is created to test whether the user that place the highest bid will be able to won the product when the auction time had ended.
Pre-condition	1. User Login to his or her respective account. 2. When the time of the auction had ended, there will be user placing highest bid on that product.
Expected Result	When the auction time has ended, the system will be able to save information of the user who has the highest bid and display the product to the user at the item winning cart.

Actual Result	The system saved all the information of the product that the user had won correctly and display the product to the right user to make payment on the product.
Test Result	PASSED
Test Step:	1. User bid for the product with the highest price. 2. Then the user waits for the auction time to end 3. Then the user goes to the item won cart to check whether the item appear in the cart or not
Test data	Highest bidding price

Test result for TC_USER_02:

ITEM WON

Item Won / Live Bidding Item / Bidding History

TORCH 90'CENTRIES

MAKE PAYMENT

Figure 6.1.9-Test result for TC_USER_02

5) User Payment testing

Test case 6:

Table 6.1.6 Verification and testing plan for TC_USER_03

Project Name	Smart Bidding Modern antique EShop
Module Name	User Module
Reference Document	User Controller, User View
Date of Creation	27/4/2023
Date of Review	27/4/2023
Test Case ID	TC_USER_03
Test Scenario	To test user will be able to pay for the product after the user had won the product.
Test Case Description	This test case is created to test whether the user who had won the product will be able to pay for the product. At the same time the admin will receive the payment that is made by the user.
Pre-condition	1. User Login to his or her respective account. 2. User had won the product
Expected Result	The user will be able to make payment for the product that the user won and the admin also will be able to receive the right amount of payment after the user pay for the product.

Actual Result	The system will receive the right amount that the user pay for the product in the stripe and save all the data of the payment made by the user into the database at the same time generate an order base on the information of the paid product.
Test Result	PASSED
Test Step:	1. User click the make payment button on the item won page 2. Then the user fill up the form about the information required by the system and press the "pay by card" button 3. Then the user fill up all the card detail and pay for the product.
Test data	Information of the payment such as email, phone number, location and also the product price.

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Test result for TC_USER_03:

Figure 6.1.10-Test result for TC_USER_03

6.2 Objective Evaluation

In this chapter, we had done several test cases mainly focusing on our objective. 6 testing plans were being used to test our system which 2 of the testing plans focus on the testing on admin management module. For the first test plan that focus on the admin management module, we try to test whether the system can allow the admin to perform all the management function on the auction product such as the add product, delete product, and also edit product. Then for the second test plan that we had implement focus on the management of the order by the admin. We try verifying that the admin will be able to manage the order that is generate by the system when the user made payment on the product that the user won. Other than that, the next test plan that we had created were testing that based on one of our objectives which is the machine learning that we were going to implement in our system. We try to test on the price prediction which is our machine learning that we implement in our system by verifying the system able to predict a price based on the range of the data that we had prepare. Next test plan is focusing on the user part, which is the user bidding process. The test plan that we had implement is going to the flow of bidding process whether it can flow from the beginning to the end successfully allowing the user to bid the product that the user interested. For the fifth test plan, we plan to test on the user that won the auction by testing the user, checking that the user will be able to won the product once the auction time had ended. Lastly, the last test plan that we had implement is the user payment testing. We try to test whether the user will be able to pay for the product after the user had won the item. After implementing all test plan, all the module pass the test and also achieve all the expected result. Hence it prove that the two objective that we had propose at the beginning of the project is well achieved.

CHAPTER 7

Conclusion and Recommendation

7.1 CONCLUSION

In this paper, a Smart bidding online antique ehop is being proposed. One of the main reasons that this system is proposed is because through our finding most of the antique selling website does not include the auction selling method which is one of the best-selling methods for the antique. Nowadays, as technology keep on improving, a lot of traditional seller that sell their product physical are digitalizing their business from the physical selling method to online selling method. This is because that selling online allow the seller to have more opportunity. By discovery this opportunity, we know that auction selling method is one of the popular way to sell antique and not much place we can find online that used this kind of selling method. So, we had decided to develop a Smart bidding online antique shop which allow the user to bid for the antique product. By developing the system mention above able to help us to achieve the objective that we had mention on the first chapter.

Not only developing an bidding system, we also try to make our bidding system smart. To achieve this, we had implement machine learning into our system so that it can make our system different from other existing system. After some research had made on the machine learning on the literature review, we had decide to implement the price prediction machine learning algorithm in our system. This is because we found out that this machine learning is the most suitable machine learning for our system due to the speciality of the attribute of the antique. This is because some of the antique are quite rare so the quantity may be limited, not every one will be able to purchase the same item. Hence, product recommendation machine learning might not be suitable to be implement in our system and also for the chatbot. Price prediction are the most suitable to be implement because it can help the admin to make prediction on the price of the antique based on the attribute that we had choose. Indeed, this will greatly increase the confidence of the seller that are using or system because the seller can try to predict the price of the antique before placing it on the auction. The seller will be able to know the range of the price of that antique and this can prevent the seller from selling a valuable product with a low price.

In conclusion, we based on the test case that we implement on the previous chapter show the system that we had develop is able to pass all the tests we proposed based on the result being shown. Besides, the developed system also fulfils and meets the objectives and we believe that this system will be a system that will be prefer by other user.

7.2 Recommendation

In this chapter, there will be some recommendation and future work to be done to improve the overall function of the system and make the system more complete. First, about the recommendation, we can first increase the user experience of the user and the admin by making the User interface more attractive applying more responsive element in the webpage. Other than that, another recommendation will be the tracking function. This function can be integrated into our system to allow the user and also the seller keep track on the order time to time. This will make increase the confidence of the user using our system by allowing the user to obtain the information of their product time to time. Next recommendation is that we can implement the newsletter function on our system to allow the user to subscribe on the newsletter of our system. By that, the user will be able to receive any update by the system immediately. This will not only increase the user experience of the user but also helping the system to have a consistent user. Last recommendation is on the selling method of the system which we can implement not only the auction selling method but also the normal selling method which allow the seller to sell things directly on the system. This will greatly increase the convenience of the user and also the seller because the user will be able to purchase the product directly and the seller will be able to sell their product in an alternative selling way.

Through all recommendation, I believe that this system will become a more interesting system that will be appreciate by the users. As time go on, we believe that this system will become a quality system.

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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T3Y3	Study week no.: 2
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- Prepared all the report to be done until chapter 3

2. WORK TO BE DONE
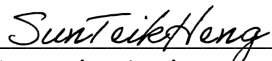
- Do more finding on the technology that are suitable for the proposed system

3. PROBLEMS ENCOUNTERED

- No problem encounter during the report phase

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the progress of reports are on track

SunTeikHeng

Supervisor's signature

Student's signature

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FINAL YEAR PROJECT WEEKLY REPORT
(Project II)

Trimester, Year: T2Y3	Study week no.: 3
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- I have made some changes on my literature review after I done some finding on the machine learning

2. WORK TO BE DONE

- Finding on the video about how to implement the stripe function into our proposed system

3. PROBLEMS ENCOUNTERED

- No problem encounter during this stage

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the progress are on track

_____SunTeikHeng_____
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Student's signature

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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T3Y3	Study week no.: 4
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- Tried to implement the stripe function that I have found on the web into the proposed system

2. WORK TO BE DONE

- Try to complete the bidding module

3. PROBLEMS ENCOUNTERED

- No problem encounter during this stage

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the progress are on track

SunTeikHeng
_____
Supervisor's signature

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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T3Y3	Study week no.: 5
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- complete half of the bidding module

2. WORK TO BE DONE

- complete the whole part of the bidding module

3. PROBLEMS ENCOUNTERED

- Everything was fine during the development due to the right resources is being implemented

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the system can be develop successfully.

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FINAL YEAR PROJECT WEEKLY REPORT
(Project II)

Trimester, Year: T3Y3	Study week no.: 7
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- Complete half part of order module.

2. WORK TO BE DONE

- Complete the whole order module.

3. PROBLEMS ENCOUNTERED

- Everything was fine during the development due to the right resources is being implemented
.

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the progress are on track

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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T3Y3	Study week no.: 8
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- Completed whole part of order module

2. WORK TO BE DONE

- Make finding on the price prediction machine learning

3. PROBLEMS ENCOUNTERED

- Everything was fine during the development due to the right resources is being implemented.
  .

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the progress are on track

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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T3Y3	Study week no.: 9
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- Complete finding on the machine learning algorithm

2. WORK TO BE DONE

- Trying to implement the machine learning algorithm to the system

3. PROBLEMS ENCOUNTERED

- Everything was fine because the right resource is found
  .

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the progress are on track

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FINAL YEAR PROJECT WEEKLY REPORT
(Project II)

Trimester, Year: T3Y3	Study week no.: 10
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- Finding suitable data to be used in the machine learning algorithm

2. WORK TO BE DONE

- Completely integrate the machine learning to the system

3. PROBLEMS ENCOUNTERED

- Spend a lot of time finding suitable data to be used in the machine learning algorithm
.

4. SELF EVALUATION OF THE PROGRESS

- Not Satisfy. This is because the progress are slow.

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FINAL YEAR PROJECT WEEKLY REPORT
(Project II)

Trimester, Year: T3Y3	Study week no.: 11
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- Completely integrate the machine learning to the system

2. WORK TO BE DONE

- Make testing on the system

3. PROBLEMS ENCOUNTERED

- Everything was fine during the development due to the right resources is being implemented
.

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the progress are on track

SunTeikHeng
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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: T3Y3	Study week no.: 12
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

---

1. WORK DONE

- Complete testing the system

2. WORK TO BE DONE

- Complete the whole report

3. PROBLEMS ENCOUNTERED

- Everything was fine during the testing as the expected result is same as the output result.

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the progress are on track

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FINAL YEAR PROJECT WEEKLY REPORT
(Project II)

Trimester, Year: T3Y3	Study week no.: 13
Student Name & ID: Soon Yu Siang 1901947	
Supervisor: Ts Sun Teik Heng	
Project Title: Smart Bidding Modern Antique eShop	

1. WORK DONE

- Complete whole part report

2. WORK TO BE DONE

- Submit the report

3. PROBLEMS ENCOUNTERED

- Everything was fine because the report is able to finish on time
  .

4. SELF EVALUATION OF THE PROGRESS

- Satisfy. This is because the progress are on track

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Poster

Universiti Tunku Abdul Rahman
Smart Bidding Modern Antique E-shop
SOON YU SIANG 19ACB01947

Introduction

Modern antique system is a platform that allow the consumer to purchase antique online without going to the physical store. As the digitalization, there were many businesses transforming from the physical to the online. So does the antique shop, as this Modern antique shop that we are going to develop, will be one of a complete e-shop that will convenient the consumer by applying different kind of feature and algorithm in the proposed system. The main goal of this project is to create a fully functional web application of a Modern antique e-shop.

Problem Statement

- Without having a filtering feature being implemented in the system it will be very inconvenient for the consumer to find for the item based on the requirement that they need.
- Most of the system does not offer auction selling method in their system.
- If we don't have a recommendation system, the user will only leave with the option searching the product manually. Even in the case of a small e-shop online have their item being categorized properly but the item may exceed the consumer ability to find what he is looking for.

Objectives

- To develop a Modern antique system using the recommendation chatbot system that can predict the item that the consumer prefer and give recommendation to the consumer.
- To develop a Modern antique system that can allow the consumer to have alternative way to purchase the antique with the normal way and also the through auction.

Literature Review

	Rubylane	1stdibs	The French antique store	Proposed System
Search function	✓	✓		✓
Filtering function	✓	✓	✓	✓
Add to cart function	✓	✓	✓	✓
Dynamic web page	✓			✓
Log in sign up function	✓	✓		✓
Bidding function		✓		✓
Web and mobile module		✓		✓
Recommendations system				✓
Chatbot				✓

System Architecture

System Display

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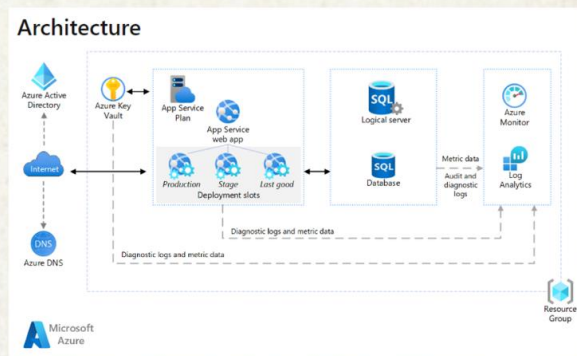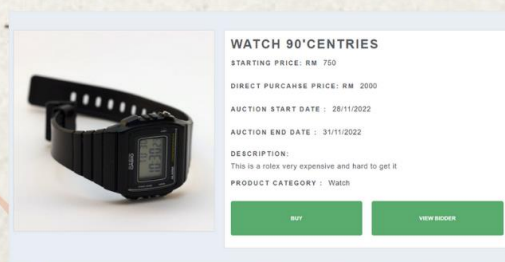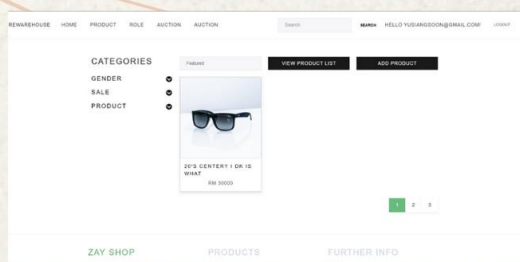
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FACULTY OF INFORMATION & COMMUNICATION TECHNOLOGY (KAMPAR CAMPUS)
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