

Furniture Management System

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Abstract— Furniture is the backdrop to our lives. Furniture is always the first component for customer consideration when it comes to designing a house. The purpose of this study is focus on the management system inside the furniture company called Perabot Sg Besar. A furniture management system is developed to assist the company to have a systematic business, proper way of showing furniture catalogue and effective delivery management. A literature analysis of the existing system that offer similar service with the proposed system is done in this study. The methodology used in the system is agile methodology. The requirement analysis is done by organization visit and interview the staff and stakeholder. The requirement analysis produced the Software Requirement Specification (SRS) and Software Design Document (SDD). Software Testing Document (STD) is produced to validate and verify the furniture management system. The testing techniques used in this system is White-Box Testing, Black-Box Testing and User Testing. PHP language and Yii2 framework technology is implemented in this system.

Keywords — Furniture Management System, Furniture Catalogue, Effective Delivery Management

I. INTRODUCTION

The growth of world furniture consumption resumed after the slump in 2009 due to the recession. Global furniture consumption grew by 3.6% worldwide and limited growth in South America and Europe. Meanwhile in Asia continuing fast expansion which were above 5% as expected. Malaysia's furniture industry had grown dramatically since the early 90's. Malaysian owing to the transformation of the furniture industry from traditional based operation to a technological driven industry.

The furniture manufacturers have a large proportion in Peninsular Malaysia compared to Sabah and Sarawak. The well-developed infrastructure, better supporting industries and amenities, as well as the accessibility to production factors are the main reasons for the rapid growth of the furniture sector in Peninsular Malaysia. According to Ward & Neumann predicted that the percentage of people spending on furnishing and household maintenance depending on the income level

would possibly spend around 4.8% to 5.9%. Therefore, the furniture industry is important to the development of the country.

II. PROBLEM BACKGROUND

The problem faced by the company is they do not have the ability to buy the expensive catalogue from the supplier. The catalogue will change up to date and the cost to buy the catalogue is extremely high which cost around RM150. Therefore, the company requests that the supplier sends the pictures of the furniture to the company through a messaging app rather than buying a furniture catalogue. The result of obtaining the furniture picture from the messaging app affects the productivity of the company when they need to search for the certain furniture that is showing to the customer. The inconvenience causes the customer to wait for a long time for the company to find the same kind of furniture category picture request from the customer in a large number of pictures sent by the suppliers.

The company also does not have systematic delivery management. The company needs to write down the delivery promised dates by customer in a notebook. The company needs to ask for the time slot from staff to arrange the delivery time. Without the systematic delivery management, the company tends to have inaccurate delivery promised dates between the company, staff and customer. The other issue may be faced during the delivery is the large amount of backbreaking human effort without well time management leading to delivery delays. Therefore, the delivery time management is important for the company.

III. ANALYSIS OF EXISTING SYSTEM

In order to acquire a broad overview of the current state of furniture management system, a quick study of comparable systems in the market will be presented below. This makes it easier to understand the fundamental qualities and features that could be incorporated into the proposed system to satisfy the essential needs of the end user.

A. PK Furniture System

PK Furniture System Sdn. Bhd. was established in 2012 by a group of enthusiastic and aggressive individuals who are all passionate about creating a specialised one-stop commercial furniture centre. Since its founding, the company has provided services to businesses, interior design firms, universities, hotels, and retail stores not only in Malaysia but also abroad in other Southeast Asian nations. In the PK Furniture System, the system provides the user to view the different categories of furniture products. This system allows the user to make orders to the cart and make payment for the order. This system also allows users to search for the products. For the admin site of the system, the admin can add products according to the category.

B. Online Furniture Shop Management System

Online Furniture Shop Management System was a project from PHPGurukul. The main aim of this project in PHP is to manage the details of customers, furniture, orders and sales report. This project consists admin module and user module. For admin, they can view all details such as total new order, total confirmed order and total product. Admin can manage the brand, category, sub-category and product. Admin can view the order details, change order status, search product and view report. For user, they can view furniture products according to categories and add products to the cart. User also can manage their profile.

TABLE I. COMPARISON OF EXISTING SYSTEM AND PROPOSED SYSTEM

Function	PK Furniture System	Online Furniture Shop Management System	Furniture Management System
Authentication	✓	✓	✓
Manage furniture	✓	✓	✓
Search furniture	✓	✓	✓
View furniture	✓	✓	✓
Manage customer		✓	✓
Manage order	✓	✓	✓
Generate sales report		✓	✓
Make order by customer	✓		
Online Payment	✓		
Manage staff			✓
Manage delivery schedule			✓

IV. METHODOLOGY

The methodology chosen for developing this system is agile methodology. Agile methodology is a type of project management process that promotes continuous iteration of development throughout the software development lifecycle. According to Verison One's State of Agile Report, there are 95% of respondents report that their organizations practice

Agile development methods. Agile methodology will increase productivity as it helps individuals or team effectively prioritize work and features. Agile methodology also will increase the product quality and customer satisfaction as it keeping customers involved and engaged in the development of project.

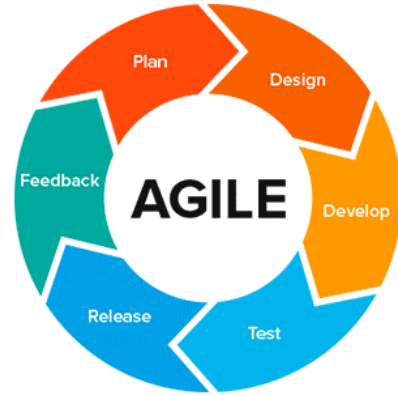


Fig. 1. Agile Methodology Phases

A. Plan Phase

In plan phase, plan for the product backlog and define the requirements for the iteration based on the product backlog. We need to write down and priorities all the user stories, goals and task linked to current iteration. In this phase, all the requirement is collected by interviewing the staff and stakeholder and organization visit. After collecting the requirement, the requirement is analyzed and Software Requirement Specification (SRS) is produced.

B. Design Phase

In design phase, a mock-up of UI design from Figma tools is created for stakeholder to review for the first iteration. For the following iteration of design phase, only refine the initial design or rework it to suit the new feature or new requirement that suggest from stakeholder. A Software Design Document is produced which include the system architecture design, use case diagram in Fig. 2, component model, class diagram, activity diagram, sequence diagram and entity relationship diagram (ERD) in Fig. 3. The system architecture used for this proposed system is Model-View-Controller (MVC) in Fig. 4.

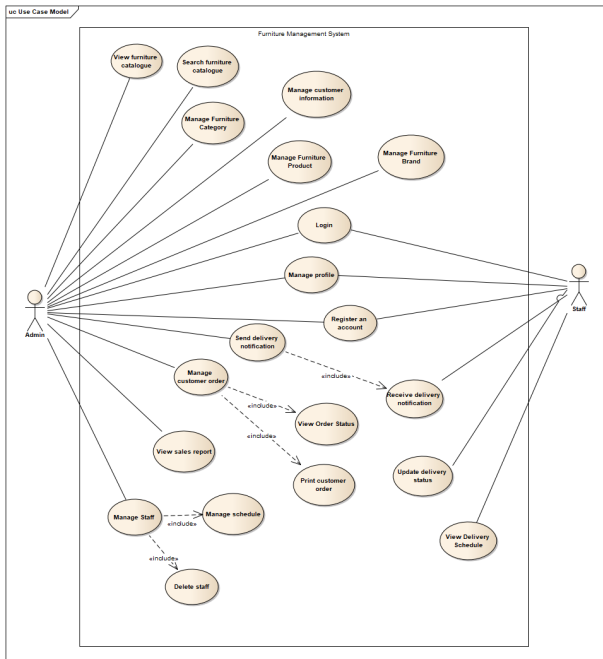


Fig. 2. Use Case Diagram

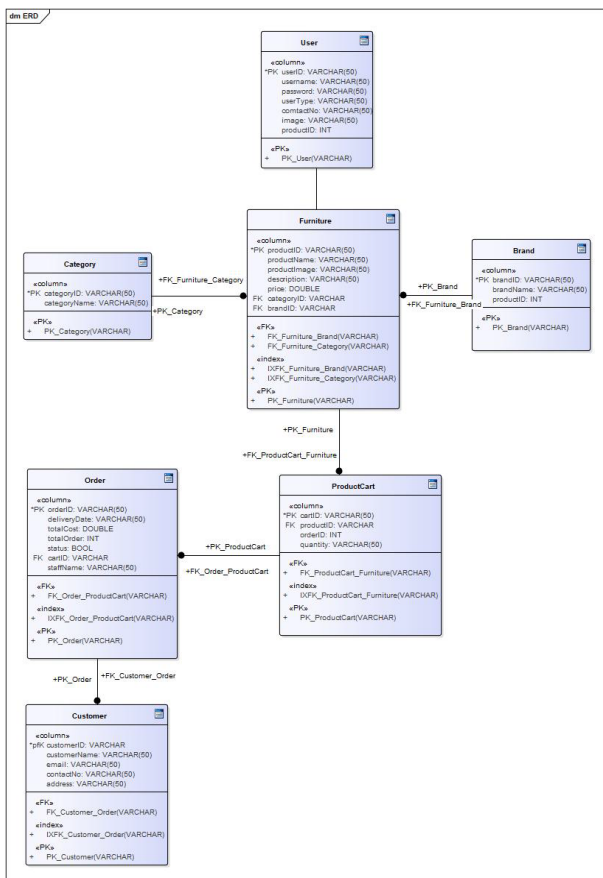


Fig. 3. Entity Relationship Diagram (ERD)

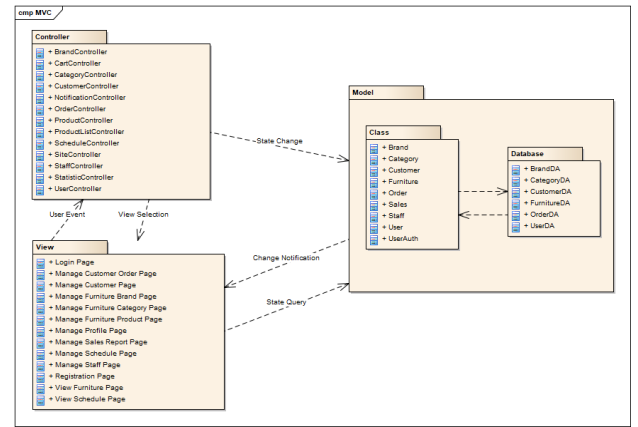


Fig. 4. Model-View-Controller Architecture

C. Develop

From the current user stories of the iteration, start coding and convert design documentation into actual software. Predict the time to complete the tasks in that iteration and start working on it. Have a backlog to track the progress of the iteration. When developer working on the task, developer taking items from the backlog to “In progress” or “Done” before end of the iteration in Trello. The technology used in this system is Yii as PHP framework, MySQL as database, Visual Studio Code as code editor, GitHub as version control using Git and Trello as project management tool.

D. Test

After developer finish to produce the actual software from tasks at that iteration, need spend time on making sure the software is bug-free by conducting a series of tests such as white box testing, black box testing and user testing.

1) White Box Testing

White Box Testing is a software testing technique that involves testing the product's underlying structure, design, and coding in order to verify input-output flow and improve design, usability, and security. In order to do the white box testing, the first thing need to understand the source code of the application. Second, we need to involve the test the proper flow and structure of the application source code. In this project, a small test for each process or set of process is created by running the Codeception in Yii framework as shown in Fig. 5. This test is called Unit Testing. As each unit or block of code is developed, it is subjected to unit testing. The programmer is primarily responsible for unit testing. In this project, I write a few lines of code, create a single function or object, and test it to ensure that it works before moving on. Unit testing aids in the early detection of the majority of bugs in the software development lifecycle. Bugs discovered at this stage are less expensive and easier to fix.

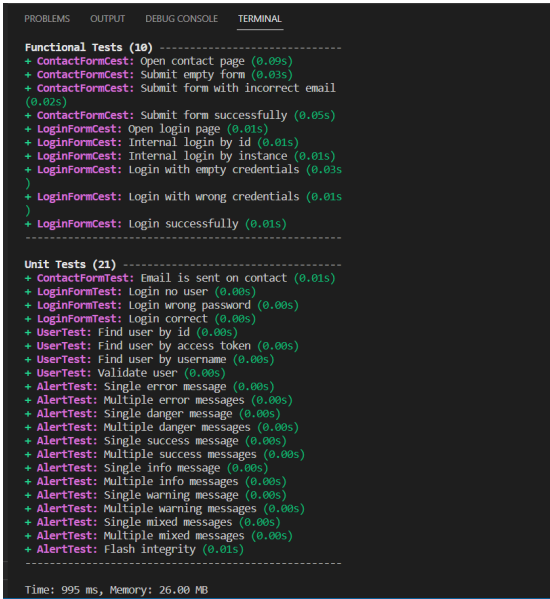


Fig. 5. Unit Testing using Codeception in Yii Framework

2) Black Box Testing

Black Box Testing is a software testing method that involves testing the functions of software applications without knowing the internal code structure, implementation details, or internal routes. Black Box Testing is a type of software testing that focuses on the input and output of software applications and is totally driven by software requirements and specifications. Fig. 6 shows the black box testing of test case TC005 in the system.

Test Case	Steps	Expected result	Actual result	Pass / Fail
TC005	1. Click "Management" at navigation bar 2. Click "Manage Category" 3. Click "Create Category" 4. Fill in the category form Category name: Sealy Status: active 5. Click "Save" button	Display toast "Category added successfully" New category is added into database	Display toast "Category added successfully" New category is added into database	Pass

Fig. 6. Test Case of Add Category

3) User Testing

User testing is known as the usability testing and it is a UX design strategy that uses a variety of methods to assess how consumers interact with a product or service. User testing can help reduce the development costs and improve retention rate. In this project, a hi-fidelity prototypes as shown in Fig. 7 which prototype is designed by using the Figma tools that allow stakeholder to interact with the it. Stakeholder is asking to perform a number of typical tasks on the website. The process of testing is being recorded and developer can review and analyze the data afterwards. If stakeholder have any issue or new requirement during the user testing, developer can change the requirement or fix the bug at the early stage.

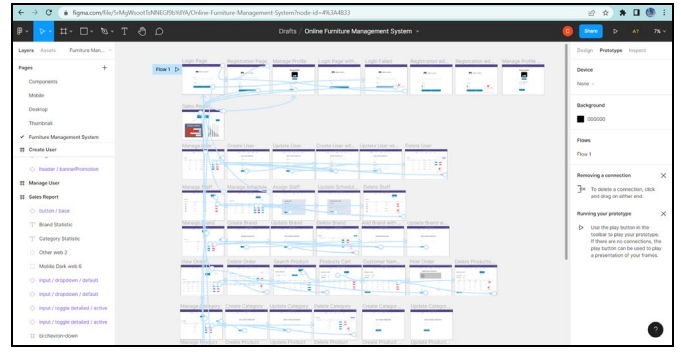


Fig. 7. Hi-fidelity prototypes in Figma

E. Release

The software application is deployed on the servers and provided to the customers to review it. Heroku is used as the cloud platform for this system. The code of the system is push into Heroku. The server link of the system is <https://furniture-management-system.herokuapp.com/>.

F. Feedback

After we deploy the application, we give it to stakeholder to evaluate the working product functionality at the current iteration and collect the feedback to enhance the functionality through the next iteration. Finally, the next iteration is started immediately and repeated all the phases.

V. INTERFACE OF THE SYSTEM

The system is developed as responsive web design. Therefore the system can be view in website or mobile application. Fig. 8 to Fig. 11 will show some interfaces in the system.

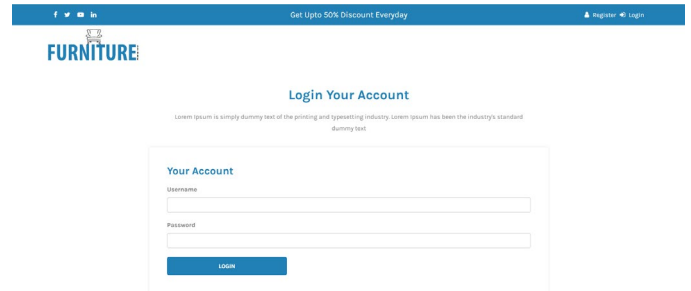


Fig. 8. Login Interface

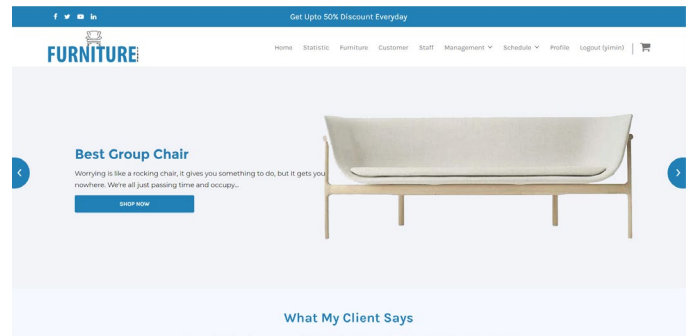


Fig. 9. Admin Main Interface

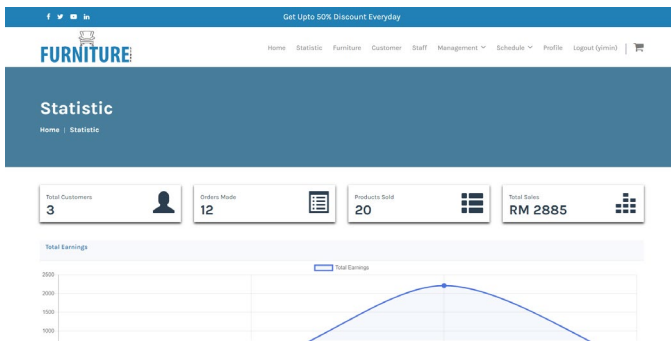


Fig. 10. Statistic Interface

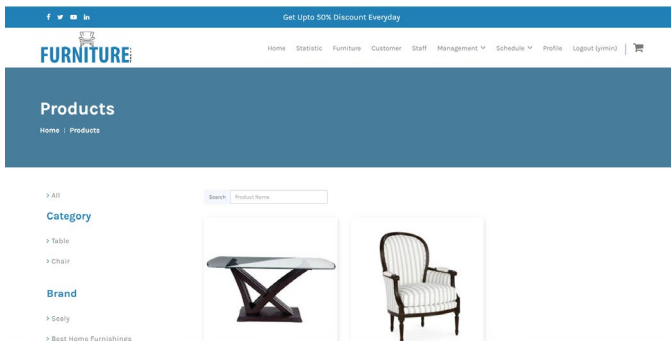


Fig. 11. Furniture Product Interface

VI. CONCLUSION

In conclusion, the main focus of this project is to develop a computerized inventory management system that helps the furniture company to manage their catalogue from supplier, manage the customer order, assign staff to delivery order and generate sales reports. Hence, the Furniture Management System proposed aims to simplify the whole business process which can help improve the performance of the company

business process. By using this system, admin can organize the customer order, furniture product and staff in a better way rather than doing it manually in papers.

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