**Part A – Group Component**

# 1.0 Introduction

Bookworm Paradise (BWP) is a one of a kind bookstore located in the capital of Malaysia, Kuala Lumpur. Renowned for its diverse collection of books covering many genres, languages, topics and eras, BWP has become a haven for literature enthusiasts. As part of its vision to “Enrich lives through the power of reading,” and its mission to "Provide accessible and diverse literary resources to enable lifelong learning and creativity for all types of people, from children to senior citizens, from local to international and many more." BWP is now undertaking a transformative step towards digital modernization. With its motto, “Books for Today, Tomorrow, and Beyond,” BWP’s commitment to innovation is driving the development of a robust and efficient system to meet customer demands in an increasingly digital world to provide for all generations.

BWP aims to study its current methods, identify inefficiencies, and design a better and more efficient system to support its step into digital services. This approach will ensure easier access to literature by the integration of new features like book rentals, e-book viewing, and in-house reading, while continuing to provide traditional services such as book purchases.

**A logo with text and images

Description automatically generated**

Figure 1

**Overview of the Present Operational Process**

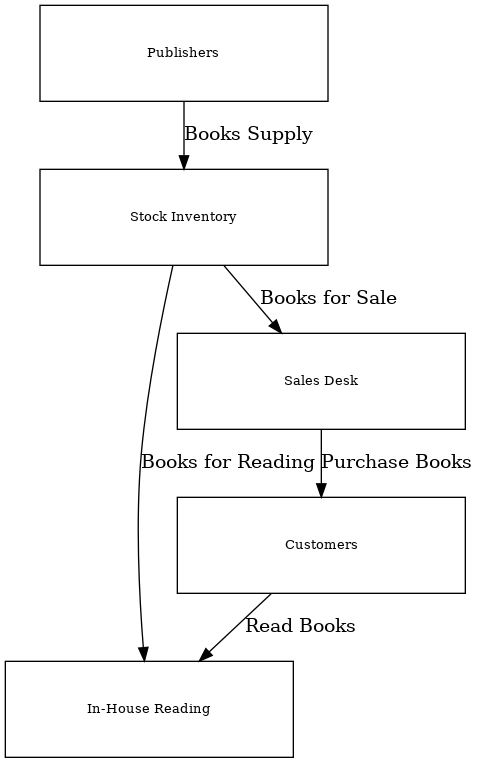
The current operations of Bookworm Paradise are mostly in-store, catering to customers who visit the bookstore to look through, purchase, or read books. Books are acquired from publishers and stored in an inventory, which is then distributed for sales and in-house reading. Customers must go to the staff at the sales desk to purchase books or access the in-house reading area to be able to read. Inventory and sales records are maintained manually by administrators, and all sales are done physically at the store. There are no digital systems in place, and the entire process relies on manual labour. Assumptions for this overview include the absence of online or digital services yet and that they rely on fully physical operations.

Figure 2

# 2.0 Problem Identification and Proposed Solutions

## 2.1 Problem Identification

Bookworm Paradise's current system is mostly physical, with little online presence and little ability to interact with customers, the current system is currently facing a few problems as BWP grows:

Limited Market Reach

Businesses lacking digital platforms struggle to expand their market reach, as they are limited to local customers. This absence of an online presence hinders growth, reduces competitiveness against digital-savvy rivals, and prevents them from tapping into the increasing demand for e-commerce (Dwivedi, 2023).

Difficulties with Payment Processing

Digital financial transactions are vulnerable to cyberattacks like fraud and identity theft since they involve the exchange of private information. Security lapses can hurt people and companies, undermining confidence in electronic payment systems. Furthermore, transactions and operations are disrupted by system errors or outages, underscoring the necessity of dependable systems and quick problem solving (Nair, 2023).

Absence of Data-Driven Insights and Reporting Cause

Even though big data analytics has numerous advantages, companies frequently struggle to implement it because of a lack of funding, unstructured data, poor IT infrastructure, and a shortage of qualified staff. These obstacles obstruct valuable insights, leading to lost chances for client interaction, inventory control, and decision-making (Lutfi, 2023).

## 2.2 Proposed Solutions

Each identified problem has a recommended solution within the proposed digital platform

Increase Market Reach With an E-commerce Platform

Social media is crucial for business digital transformation, promoting user engagement and collaboration. By using social platforms for marketing, businesses can strengthen relationships, gain insights, and boost brand awareness, leading to increased sales and customer involvement (Dwivedi, 2023).

Include a Secure Online Payment System Solution

Robust cybersecurity measures like encryption, secure authentication, and real-time monitoring are crucial to protect sensitive data during digital transactions. Regular audits and updates enhance resilience against cyber threats. To prevent disruptions, businesses should invest in reliable infrastructure, disaster recovery systems, and responsive support to ensure continuity and maintain trust (Nair, 2023).

Put Data Analytics and Reporting Solutions into Practice

Businesses that integrate structured and unstructured data in real time can enhance data reliability using tools like cloud computing and virtualization. Regular investments in technology, training, and data systems are essential for maintaining quality. Collaboration between governments and vendors, including tailored solutions and subsidies, can further support big data adoption (Lutfi, 2023).

## 2.3 Aim

The aim of this project is to create a comprehensive digital platform for Bookworm Paradise that will be of help to the company's expansion into domestic and foreign markets by increasing customer engagement, market reach, and operational efficiency.

Create an E-commerce Platform

Firstly BWP should provide a system that allows a wider audience to buy, rent, and read e-books online.

Ensure Secure Payment Processing

Moving on, BWP should ensure Secure Payment Processing, this is in order to enable easy and secure online purchases, incorporate a secure payment gateway.

Enable Data-Driven Decision Making

Lastly BWP should also enable Data-Driven Decision Making in order to assist strategic planning and boost profitability, offer reporting tools for monitoring sales, rental, and customer data.

# 3.0 Project Planning

## 3.1 System Development Life Cycle

System Development Life Cycle (SDLC) is one of the most important elements in a system development process of a project. It is also known as an application development cycle. It is an organized development method but it normally has a duration requirement for more than 1 year. There are 5 phases of development, which are system planning, system analysis, system design, system implementation and system security and support.

System Planning Phase

We have been assigned to create a digital application with some well-developed functions for Bookworm Paradise (BWP), a bookstore in Kuala Lumpur. BWP wish to include three new service in the application which are, online purchasing of reading material, book rental and e-book viewing feature. BWP is also going to offer different types of discounts to each membership level, premium, gold and standard. In the first phase of SDLC, we are going to fully understand the requirements of the prototype which we have been assigned. These are the basic functions and requirements which we will be reaching out and there are two users of the system: customer and staff. We also prepare a preliminary investigation report to represent our initial findings of the project planning.

Customer functions:

1. Register
2. Login
3. Purchase Book
4. Make Payment
5. Receive Receipt and Book

Staff functions:

1. Login
2. Add Booking Information
3. Process Payment
4. Generate Receipt and Token

After that, we are going to distribute each function or requirement to every team member equally. Hence, we can cooperate with each other to complete the work in good hands. The distribution of work to each member is shown at the **Workload Matrix** form below.

System Analysis Phase

In the second phase of the project, we are going to build a logical model for the new system. We have conducted interviews with the customers of BWP and the manager of BWP in the fact-finding process. In the interviews with the customers, we can further understand the needs and wants of the customers in the newly released features. As a result, we can develop the digital application that meets customers’ satisfaction. In the interview with the manager of BWP, we get to know the details of the requirements of the project that we have been assigned and discuss the range of discounts offered to the customers. Moreover, we also deliver the paperwork of our proposal to the manager of BWP for approval.

System Design Phase

In this phase, we have created the digital wireframe and mock-up of the digital application. After that, we create the actual user interface based on the mock-up. Apart from that, we also identify the output, input and process. The output is the login details and customer personal information. Login details include the user id and password. Customer personal information includes the name and email address. The process is the service chosen by the customer. It is either online purchasing of reading material, book rental and e-book viewing feature.

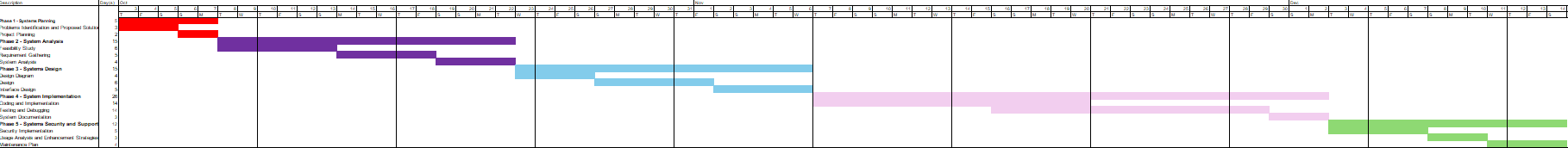
System Implementation Phase

At the System Implementation Phase, an organized digital application system is created. The program has been written and successfully passed through the testing process. Hence, the digital application can be installed and applied.

System Security and Support Phase

At this phase, we fix the errors and imperfections of the system. Furthermore, we also develop the system according to the customers’ feedback to make sure the application fits most customers flawlessly. The most important one is that we improve the security level of the system by building firewall and launching real-name authentication of every user while login. By doing this, account hacking and information leaking would be avoided. Customers’ satisfaction with account security will be improved as well. Aside from that, we also provide new features and benefits the objective of the application. This helps to increase customer satisfaction as well as maximize the return of IT investment.

## 3.2 Gantt Chart



Full Gantt Chart submitted in another file.

## 3.3 Workload Matrix

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Area** | **AHMED MAHIL MOHAMED**  **(TP 074924)** | **ANDERSON TEY LE TIEN**  **(TP 076394)** | **CHEK KA NIC**  **(TP 074894)** | **CHONG WEI JIE**  **(TP 076546)** | **MAH ZHENG YANG**  **(TP 076666)** | **THIANG CHONG YI**  **(TP 076850)** |
| **Introduction** | **10%** | **10%** | **50%** | **10%** | **10%** | **10%** |
| **Problem & Solution** | **10%** | **10%** | **10%** | **10%** | **10%** | **50%** |
| **Project Planning** | **10%** | **10%** | **10%** | **50%** | **10%** | **10%** |
| **Feasibility Study** | **10%** | **50%** | **10%** | **10%** | **10%** | **10%** |
| **System Analysis** | **15%** | **15%** | **15%** | **15%** | **25%** | **15%** |
| **Design Diagram** | **16%** | **16%** | **20%** | **16%** | **16%** | **16%** |
| **Interface Design** | **10%** | **10%** | **10%** | **10%** | **50%** | **10%** |
| **Digital Signature** | **Ahmed** | **Anderson** | **Chek** | **Chong** | **Mah** | **Thiang** |

# 4.0 Feasibility Study

## 4.1 Operational Feasibility

Definition:

* Operational Feasibility is the process to identify the effectiveness of new system by make sure it can solve the existing problem and bring benefits to user. Operational Feasibility is required to ensure the new system fulfil users’ requirements. It can be presented detailly using PIECES Framework.

PIECES Framework:

* PIECES Framework is a basic structure used during system analysis to list out some problems that might face when operating a system. PIECES Framework is important as it help to calculate the effectiveness of system. The elements of PIECES Framework are performance, information, economy, control, efficiency, and services (Andarwati et al, 2020).

Analysis:

* Performance

Is our technology able to operate the new system smoothly?

-Yes, the technology we have enable the new system to run with 60 fps, it will bring a smooth experience to users.

* Information

Does the new system provide more accurate details of books to customers?

-Yes, the new system will keep updating latest information to make sure the book details are accurate.

* Economy

Will the use of digital platforms bring more income to BWP?

-Yes, the system will bring BWP to an international stage and the increasement of revenue are about 60%.

* Control

Do users’ personal information be protected in the new system?

-Yes, the latest firewall will be use in the new system, only manager with special permission is able to access the database.

* Efficiency

Does the new system need less workers compared to the old system?

-Yes, 50% of workers’ duty will be replace by the new system, the cost for employee salaries will reduce.

* Services

Is the new system able to keep upgrading when new function is developed?

-Yes, the new system is flexible and allowed to be upgrading whenever it needs.

Conclusion:

* As a conclusion, the development of new system will directly increase the user experience. The new system could solve the existing problem in a cost-effective solution according to the PIECES Framework.

## Technical Feasibility

Definition**:**

* Technical Feasibility is the process of determining whether the existing resource meet the technical requirement of the system development project. It helps to make sure the new system is available to develop by current technological support (Kusuma et al, 2023).

Analysis:

* Do we be able to develop the whole system using the existing technological support?

-Yes, we can fulfil those requirements by our existing technological support as we had developed various of similar systems before.

Conclusion:

* According to the Technical Feasibility, we can develop the new system by current technical resource, it means that the cost of implementing will not be wasted for purchasing technology facilities.
  1. **Schedule Feasibility**

Definition:

* Schedule Feasibility is the process to ensure the implementation of new system could be done within the proposed timeframe. It play an important role for developer to plan the implement process wisely to avoid failure of the project (Shiksha, 2023).

Analysis:

* Can we be able to develop the whole system within the estimated timeline?

-Yes, we will complete all the development of functions within 4 months according to the Gantt chart we had created.

Conclusion:

* As a conclusion, the project can be finish within the timeline given, a Gantt chart is very important in Schedule Feasibility as it help to plan the whole implementation process to make sure it will not fail.

## 4.3 Economic Feasibility

Definition:

* Economic Feasibility is a process to determine the cost and benefits of the whole project. It includes the cost of system development and the cost for operating the new system, to make sure the project can be done within the given budget.

Cost-Benefit Analysis:

* Cost-Benefit Analysis is commonly used during the process of Economic Feasibility to show the profit of new system, and the total cost during implementation and operation phase.

Analysis:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Cost-Benefit Analysis – Bookworm Paradise System** | | | | | | | |
| **Costs** | **Year** | | | | | | |
|  | **0** | **1** | **2** | **3** | **4** | **5** | **6** |
| Development Costs | -80000 |  |  |  |  |  |  |
| Operating Costs |  | -97500 | -100000 | -102500 | -105000 | -107500 |  |
| **Total Costs** | **-80000** | **-97500** | **-100000** | **-102500** | **-105000** | **-107500** |  |
| Discount Factor | 1.00 | 0.87 | 0.76 | 0.66 | 0.57 | 0.50 |  |
| Present Value of Costs | -80000 | -84769 | -76160 | -67713 | -60190 | -53985 |  |
| Cumulative PV Costs | -80000 | -164769 | -240929 | -308642 | -368832 | -422817 | -422817 |
| **Benefits** |  |  |  |  |  |  |  |
| Tangible Benefits from New System |  | 130000 | 140000 | 151000 | 163100 | 176410 |  |
| Intangible Benefits from New System |  | 20000 | 22000 | 24200 | 26620 | 29282 | 20000 |
| **Total Benefits** |  | **150000** | **162000** | **175200** | **189720** | **205692** | **20000** |
| Discount Factor | 1.00 | 0.87 | 0.76 | 0.66 | 0.57 | 0.50 | 0.43 |
| Present Value of Benefits |  | 130453 | 123058 | 115701 | 107985 | 102961 | 8716 |
| Cumulative PV Benefits |  | 130453 | 253511 | 369212 | 477197 | 580158 | 588874 |
| Cumulative PV Benefits + Costs | -80000 | -34316 | 12582 | 60570 | 108365 | 157341 | 166057 |

Conclusion:

* The new system will make more profit compared to the current system, the implementation of new system is able to be done within the budget given. Moreover, it can cover the cost after first year of using the new system according to the Cost-Benefit Analysis.

# 5.0 System Analysis

## 5.1 Functional Requirement

Functional requirement specifies the core functions a system must perform to meet user needs. They define what the system should do.

Functional requirement for user

1. The system allows customers of Bookworm Paradise to register and login into account to make orders.
2. Customers can make purchases or rental for books through the system.
3. Customers can make any form of payments for any purchase and rental through this system.
4. The system allows customers to add reading materials that the customer intent to purchase or rent to the shopping cart.
5. The system allows customers to online viewing some preview content of the book.

Functional requirement for admin of Bookworm Paradise

1. The system allows admin to login to the Bookworm Paradise accounts to use access the functions in the system.
2. The system lets the admin to generate receipts and tokens for the customer after the purchase and rentals.
3. The admin can manage payment made by customer using this system.
4. The admin can manage and update the membership discount for the customer by using this system.
5. The system allows admin to add new reading materials into the system in order to increase the variety of books.

## 5.2 Non-Functional Requirement

1. The system can support up to 5000 concurrent users at the same time.
2. The system should load pages within 2 seconds for 99% of the users.
3. The system must perform without failure in 99% of use cases.

## 5.3 Architectural Requirements

1. The system will host the website on a cloud-based infrastructure for scalability and reliability.
2. The system will use a centralized database for storing user profiles, book inventory, and transaction records.
3. The system will use a modular architecture to separate book management, user profiles, and payment systems.

## 5.4 Business Requirements

1. The system allow admin to promote membership exclusives to attract non-members to become paying members.
2. The system can provide analytics to track user activity and identify popular books or genres.
3. The admin using the system can offer seasonal sale and discount during special festival.

## 5.5 System/Technical requirements

1. The system will allow user to do transaction through eWallet or online banking.
2. The system can support multiple currencies around the world for international customers.
3. The system can be compatible on different operating system such as Android, IOS, Window or macOS.

## 5.6 User requirements

1. The system allow users to view their order history, rental status, and fines.
2. The system can offer personalized book recommendations based on user reading history.
3. The system allow users to edit their profile, password or account details.

## 5.7 Security requirements

1. The system will provide role-based access for admin users to prevent unauthorized data modification.
2. The system should implement multi-factor authentication for user logins.
3. The system will be installed with a powerful firewall to safeguard all the data and prevent data breaching.

## 5.8 User Interface requirements

1. The system interface must be organized and user-friendly.
2. The layout and design of the system must be consistent,
3. The shortcut function of the system should be intuitive and high learnability.

# 6.0 Design Diagram

## 6.1 System Context Diagram

A diagram of a computer system

Description automatically generated

Figure 3

## 6.2 Data Flow Diagram Level 0

A diagram of a diagram

Description automatically generated

Figure 4

## 6.3 Entity Relationship Diagram

A diagram of a diagram

Description automatically generated

Figure 5

# 7.0 Interface Design

A screenshot of a video game

Description automatically generated

Figure 6: Main Page

A screen shot of a register form

Description automatically generated

Figure 7: Register Page

A login screen with black and white text

Description automatically generated

Figure 8: Login Page

A profile of a person

Description automatically generated

Figure 9: Profile Page

A screenshot of a computer

Description automatically generated

Figure 10: History Page

A screenshot of a order

Description automatically generated

Figure 11: Order Page

A screenshot of a computer

Description automatically generated

Figure 12: Membership Plan Page

A screenshot of a book

Description automatically generated

Figure 13: Filter Books Page

A screenshot of a book

Description automatically generated

Figure 14: Product Page - Purchase

A screenshot of a book

Description automatically generated

Figure 15: Product Page - Rental

A screenshot of a book

Description automatically generated

Figure 16: Product Page – In-house Reading

A screenshot of a book store

Description automatically generated

Figure 17: Cart Page

A screenshot of a checkout

Description automatically generated

Figure 18: Checkout Page

A screenshot of a receipt

Description automatically generated

Figure 19: Receipt Page

A login screen with black and white text

Description automatically generated

Figure 20: Staff Login Page

A white rectangular object with black text

Description automatically generated

Figure 21: Staff Main Page

A screenshot of a computer

Description automatically generated

Figure 22: Staff View All Products Page

A screenshot of a computer

Description automatically generated

Figure 23: Staff Add Products Page

A screenshot of a graph

Description automatically generated

Figure 24: Staff Generate Report Page

A close-up of a membership form

Description automatically generated

Figure 25: Staff View All Membership Page

A screenshot of a book list

Description automatically generated

Figure 26: Staff View List of Books Sold, Rented & Read Online Page

A screenshot of a computer screen

Description automatically generated

Figure 27: Staff View All Order Page

A screenshot of a voucher

Description automatically generated

Figure 28: Staff Generate Voucher Page

## 7.2 Concepts and Principles

### 7.2.1 Input Interface Design

Simplicity

On the website, the titles of the pages are in bold style. Bold words help emphasize the important message on the webpage. With this, customers will be able to differentiate the titles and the contents of the webpage easily. For example, in Figure 1, the title of the page is in bold style while the words in the content are in a normal style. This significantly reduces the annoyance of customers when trying to know what page they are on. Besides, the website adopts a minimalist design that has no excessive and unnecessary design such as pictures and videos in the website.

Ease of Use

The website emphasizes ease of use in all the functions and features. Customers can access all functions and input forms easily. For instance, in Figure 2, the login form is clean and labeled clearly. Customers can understand what to fill in the form easily without any unsure. With this, customers will have a better experience when browsing the website.

Consistency

The website utilizes a simple layout and easy-to-understand interface to allow users to navigate the website smoothly. For example, in Figure 3, the header and the sidebar of the webpage are fixed so that the customers can access them whenever they want. This creates a user-friendly interface and improves the customer experience when browsing the website.

### 7.2.2 Output Interface Design

The website’s output interface is professional, clear, and easy to understand. All output interfaces have a clear title and detailed information. All data in the report and receipt are in an organized form and an understandable manner. For instance, in Figure 1, a bar chart is utilized in the report to showcase clearer information on revenue over a period of time. Bar charts significantly help in data representation and improve user understanding. With this, users will be able to receive more accurate and clear information from the output interface.

**Part B – Individual Component**

**8.1 Requirement Gathering: Survey and Questionnaire**

**(Thiang Chong Yi TP076850, Chek Ka Nic TP074894)**

Definition  
A questionnaire is a data collecting method that consist a series of standardized questions to gather statistically useful information on a specific subject from one or more respondents. The main objective to conduct a questionnaire is to collect a large amount of data that can be analyzed quantitatively or qualitatively. Questionnaires can be administered through various formats, including paper-based, online, or face-to-face methods, and are widely used in research to assess attitudes, behaviours, and opinions (Brace, 2018).

Advantages of questionnaire

Due to its usefulness and efficiency in getting data from a large audience, Google Forms was selected as the information gathering tool. This platform is a good option for conducting surveys since it provides a lot of advantages.

Its simplicity of use is a key benefit, as creating and distributing surveys with Google Forms needs no technical expertise. Because it is so easily available, anybody with internet connection can access the survey at any time and from any location. By automatically gathering data and offering real-time analytics, the platform also provides automation, which greatly minimizes the amount of manual labor required to handle replies. Additionally, Google Forms offers a great deal of versatility, allowing users to create forms with several kinds of questions, including text replies, multiple-choice, and scales. Finally, it is an economical option, providing all necessary features without charging more for them.

Drawbacks of questionnaire

There are certain restrictions to take into account in spite of these benefits. One disadvantage of surveys is the lack of opportunity for clarification or follow-up questions to probe more into respondents' opinions, which limits interaction when compared to in-person interviews. Response rates are another issue; if the survey is not adequately followed up on or offered incentives, they may be poor. Additionally, the approach lacks context because answers are restricted to the questions posed, which may cause deeper insights to be missed. Last but not least, Google Forms depends on users having internet connection, which not everyone can provide.

Target audience of questionnaire

As Bookworm Paradise does not exist in real life, we had faced a limitation on finding actual users of the system. Therefore, we asked 30 respondent from our classmate and friends to help us fill in the questionnaire form to gather data for further analysis. We shared the Google form link to our classmate and they answered the questionnaire whenever they are free.

Sample question of the questionnaire

1. Having access to a wide variety of book genres influences my decision to visit a bookstore.

\_\_\_ Strongly disagree

\_\_\_ Disagree

\_\_\_ Neutral

\_\_\_ Agree

\_\_\_Strongly agree

1. I would prefer to purchase book through online platform.

\_\_\_ Strongly disagree

\_\_\_ Disagree

\_\_\_ Neutral

\_\_\_ Agree

\_\_\_Strongly agree

1. I would use a book rental service if it were available online.

\_\_\_ Strongly disagree

\_\_\_ Disagree

\_\_\_ Neutral

\_\_\_ Agree

\_\_\_Strongly agree

1. I would use an in-house reading service if the environment were comfortable.

\_\_\_ Strongly disagree

\_\_\_ Disagree

\_\_\_ Neutral

\_\_\_ Agree

\_\_\_Strongly agree

1. The addition of an e-book viewing feature would improve my experience.

\_\_\_ Strongly disagree

\_\_\_ Disagree

\_\_\_ Neutral

\_\_\_ Agree

\_\_\_Strongly agree

1. I am more likely to purchase a membership if it offers significant discounts.

\_\_\_ Strongly disagree

\_\_\_ Disagree

\_\_\_ Neutral

\_\_\_ Agree

\_\_\_Strongly agree

1. Delivery services are essential for an online bookstore.

\_\_\_ Strongly disagree

\_\_\_ Disagree

\_\_\_ Neutral

\_\_\_ Agree

\_\_\_Strongly agree

1. I would prefer to shop on a online website that are organized and user friendly.

\_\_\_ Strongly disagree

\_\_\_ Disagree

\_\_\_ Neutral

\_\_\_ Agree

\_\_\_Strongly agree

Outcome of the questionnaire in bar chart

Here are the link to access the questionnaire form:

<https://docs.google.com/forms/d/e/1FAIpQLSe3aerOhw11FcoTlJWK3AcFx1NTpb0mAIsxW95E_6N0faK23g/viewform?usp=sf_link>

A screenshot of a computer screen

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A screenshot of a graph

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**8.2 Requirement Gathering: Document Review**

**(Ahmed Mahil Mohamed TP 074924, Mah Zheng Yang TP076666)**

Description:

When using the document review method, records and documents relating to an organization's performances, procedures, and operations are examined. For Bookworm Paradise (BWP), this means examining sales records, inventory logs, customer feedback, membership details and financial reports. By reviewing these documents, valuable insights can be gained about the current operational workflow, challenges, and areas for improvement.

Benefits:

* Objective and factual data: Documents provide factual data, which minimises the biased responses that might be seen in interviews or surveys. And continuous patterns like number of sales, most popular genres of books, and customer preferences, can be identified more easily.
* Cost-Effective: Reviewing existing documents costs far less compared to other methods like face to face interviews or focus groups.
* Baseline for comparison: Using old records it will be easier to compare between current operations and future improvements after implementing the system.
* More efficient: Large amounts of information are easily accessible without the additional involvement of the shareholders.
* Highlights Compliance and Standards: By using documents related to financial reporting or customer transactions ensures that everything is legal and regulatory requirements are considered during system design.

Setbacks:

* Outdated Information: Existing documents may not have the latest changes in processes or customer needs, which may produce outdated results.
* Incomplete or Missing Records: Operating records may not have critical details or may be inconsistent which may in turn affect the reliability of the analysis.
* Access Issues: Sensitive or confidential documents may not be readily available right on the moment for review which limits the available amount of data that can be used for the analysis.

Target documents for reviewing:

1. Website Backend Documentation
2. Customer Feedback Report
3. Compliancy and Security Documentation
4. Website Analytics Report

Questions that can be used in Document Review

1. What is the difference between the systems?
2. What makes the system better?
3. Is there any solution to overcome this problem?
4. What are the common problems in the systems?

Steps to carry out document review:

Step 1: Determine the relevant documents to be reviewed

In this step, system analyst has to determine documents that are suitable for the document review. Documents can be found on the Internet or the library.

Step 2: Define review criteria

After determining the materials, system analyst have to define all the review criteria so that the focus areas are clear

Step 3: Conduct document review

In this step, system analyst starts to conduct review on the documents, make comparison and find out the differences between systems.

Step 4: Document and communicate findings

In the last step, system analyst concludes all the findings and see what to follow-up with the stakeholders.

**8.3 Requirement Gathering: Interview**

**(Anderson Tey Le Tian TP076394, Chong Wei Jie TP076546)**

Definition:

We had chosen interview as our data collection method. Interview also known as a qualitative research method which collect data through direct conversation, or even by online meeting. The person who being interviewed need to give their point of view according to the questions ask by interviewer. Their answer will be recorded as a reference for system implementation, and it is important to get opinion from person with extensive experience in related fields.

Advantages**:**

The first reason we choose interview as our fact-finding technique is interview offer an interactive process of data collection. It will not make the interviewee feel boring when answering the questions. Meanwhile, other information gathering methods like survey will only giving a set of questions to participants, and it does not attract participants to give their answers properly (Jain & Neha, 2021).

Besides, an interview allows us to ask more personalised questions as the questions of interview are different depending on who we are interviewing (Laryeafio & Omoruyi, 2023). It allows us to get more accurate information for developing a user-friendly system.

Disadvantages:

However, there are several disadvantages of using interview as a data collection method, first of all is interview takes more time compared to other methods. It is because interviewers need to have a well understanding of the interviewee to conduct the interview successfully. Thus, we need to do enough research about the background of interviewee and generate a series of questions related to the person. Not only that, we need to schedule a time that both interviewer and interviewee are available to carry out the interview.

Moreover, a successful interview requires strong communication skill of interviewer to avoid misunderstanding. Interviewer with perfect communication skill will directly increase the efficiency of conversation. However, if the interviewer cannot carry out the questions clearly, it might cause inaccurate data or even ruin the whole meeting. Therefore, the interviewer needs to be trained before take part in an interview, this will increase the cost of whole project.

Location to Conduct the Interview

- Bookworm Paradise Bookstore

Target Audience to Interview

- Customers of Bookworm Paradise Bookstore

- Employees of Bookworm Paradise Bookstore

- Stakeholders of Bookworm Paradise Bookstore

Set of Questions to be Asked During the Interview

- Do you do online shopping on books with lower prices?

- Would you prefer reading books online or physically?

- Would you rent a book temporarily?

- What do you think Bookworm Paradise Bookstore needs to improve?

- Do you enjoy purchasing at Bookworm Paradise Bookstore?

Steps to Carry Out Interview

1. We find groups of respondents and individuals of respondents of different ages and genders. After we get permission to talk to them, we introduce ourselves and ask them if they have an interest in answering our questions. Then, we start asking them some questions about the new features that launched in Bookworm Paradise Bookstore.
2. We ask each question and give suitable time for the respondents to think about it. The questions include open-minded and close-minded questions. Hence, we record every answer from the respondents.
3. The interviewers establish the objective of the interview. They obtain the facts and data in the record correctly. The information of the interview like, personal information of respondents, date, time, place, duration and topics will be recorded.
4. The interviewer keeps responding and interacting with the respondents. They exchange and share their own experiences too. The interviewer pays attention to the respondents and summarizes the topic at the end of the interview.
5. The interviewer thanks the respondents for answering questions. Last, we evaluate and analysis the data of the interview. We make changes and development to the Bookworm Paradise Bookstore’s digital system based on most respondents’ needs.

# 9.0 Design

**THIANG CHONG YI TP076850**

DFD level 1 and Data Dictionary of 1.0 Account Registration/Subscription

A diagram of a flowchart

Description automatically generated

**Data Dictionary**

**External Entity**

**Name**: User  
**Description**: The User provides registration details to create an account and receives a confirmation upon successful registration.  
**Input Data Flow**: Registration Details (Name, Email, Password, Phone Number).  
**Output Data Flow**: Registration Confirmation.

**Process**  
**1.1 Collect Registration Details**  
**Input**: Name, email, password, phone number.  
**Output**: Collected registration details.

**1.2 Validate Registration Details**  
**Input**: Collected registration details.  
**Output**: Validated registration details or error message.

**1.3 Create User Account**  
**Input**: Validated registration details.  
**Output**: Account details saved to the User Account data store.

**1.4 Send Registration Confirmation**  
**Input**: Account details.  
**Output**: Registration confirmation to the user.

**Data Flow**  
**Name**: Registration Details  
**Description**: Contains user-provided information for account creation.  
**Origin/Source**: User external entity.  
**Destination/Sink**: Process 1.1 (Collect Registration Details).  
**Data Structure**:

* Registration Details = Name + Email + Password + Phone Number

**Data Elements**:

1. **Name**: Full name of the user.
   1. **Type**: Text
   2. **Length**: Up to 50 characters
2. **Email**: Unique identifier for the user.
   1. **Type**: Text (email format)
   2. **Length**: Up to 100 characters
3. **Password**: User's encrypted password.
   1. **Type**: Alphanumeric
   2. **Length**: Minimum 8 characters
4. **Phone Number**: User's contact number.
   1. **Type**: Numeric
   2. **Length**: 10-15 digits

**Data Store**  
**Name**: DS1 User Account  
**Description**: Stores user account information after successful registration.  
**Input Data Flow**: Account Details from Process 1.3.  
**Output Data Flow**: User Information for validation or account-related processes.**Data Structure**:

* User Account = UserID + Name + Email + Password + PhoneNumber + DateRegistered

**Data Elements**:

1. **UserID**: Unique identifier for the user.
   1. **Type**: Alphanumeric
   2. **Length**: 6
   3. **Output Format**: U001
2. **Name**: Full name of the user.
   1. **Type**: Text
   2. **Length**: Up to 50 characters
3. **Email**: User's email address.
   1. **Type**: Text (email format)
   2. **Length**: Up to 100 characters
4. **Password**: Encrypted user password.
   1. **Type**: Alphanumeric
   2. **Length**: Minimum 8 characters
5. **PhoneNumber**: User's contact number.
   1. **Type**: Numeric
   2. **Length**: 10-15 digits
6. **DateRegistered**: Date the account was created.
   1. **Type**: Date

**Format**: YYYY-MM-DD

**MAH ZHENG YANG TP076666**

DFD level 1 and Data Dictionary of 2.0 Purchase/Rent Books

A diagram of a flowchart

Description automatically generated

**Data dictionary**

**External Entity**

**Name:** User

**Description:** User makes payment after validation of data and confirms the order

**Input data flow:** Receipt

**Output data flow:** Payment details

**Process**

**Name:** 2.1 Validate Order

**Description:** Send verified order after order validation

**Input data flow:** Payments details and Authentication data

**Output data flow:** Verified order

**Process:** START

Read in payment details

Receive authentication data from data store

IF order is validated

Send verified order

ELSE

Wait for the order to be validated

END ELSE

END

**Data Flow**

**Name:** Receipt

**Description:** Contain information of receipt no, total price, etc..

**Origin/Source:** Confirm Order Process

**Destination/Sink:** User External Entity

**Data Structure:** Receipt = Book name + Total price + Receipt No + Order No + Receipt date + Payment details + Payment date + Payment method

**Data Element:**

* **Name:** Receipt No
* **Description:** Used to uniquely track the customer’s order
* **Element Characteristics:**

**Type:** Alphanumeric

**Length:** 9

**Output format:** R00000001

**Data Store**

**Name:** DS2 Order

**Description:** To store the details of orders that have been confirmed

**Input data flow:** Restock orders and stock request

**Output data flow:** Stock data and restock confirmation

**Data Structure:** Order = Order No + Book name + Total price + Transaction ID

+ Payment method + User details

**Data Element:**

* **Name:** Order No
* **Description:** Used to uniquely identify each order made by customers
* **Element Characteristics:**

**Type:** Alphanumeric

**Length:** 12

**Output format:** ORD000000001

**AHMED MAHIL MOHAMED TP074924**

DFD level 1 and Data Dictionary of 3.0 Preview and Read Books

**A diagram of a software development

Description automatically generated with medium confidence**

**Data Dictionary**

**External Entity**

* **Entity Name**: **Customer**
  + **Description**: The customer uses the system to preview or read books.
  + **Input Data Flow**: Book Request
  + **Output Data Flow**: Reading Charges

**Process**

* **Process Name**: **5.4 Calculate Reading Charges**
  + **Description**: Determines the cost of in-house reading or e-book preview based on the type of book and reading duration.
  + **Input Data Flow**: Reading Preferences
  + **Output Data Flow**: Charges Details

**Data Flow**

* **Name**: Charges Details
  + **Description**: Contains the computed charges for preview or in-house reading sessions.
  + **Origin/Source**: Calculate Reading Charges
  + **Destination/Sink**: Customer
  + **Data Structure**: Charges Details = Book ID + Reading Duration + Charge Amount
  + **Data Element**:

**Name**: Charge Amount

**Description**: Total cost based on the book type and duration.

**Type**: Numeric

**Format**: RM 00.00

**Data Store**

* **Data Store Name**: DS2 Usage Records
  + **Description**: Stores logs of customer preview or in-house reading sessions, including duration and charges.
  + **Input Data Flow**: Usage Log
  + **Output Data Flow**: Usage Reports
  + **Data Structure**: Usage Record = Customer ID + Book ID + Duration + Charge Amount
  + **Data Element**:

**Name**: Customer ID

**Description**: Unique identifier for each customer.

**Type**: Alphanumeric

**Length**: 6

**Example**: ABCD123

**Chong Wei Jie TP076546**

A black screen with white text

Description automatically generatedDFD level 1 and Data Dictionary of 4.0 Manage Book Inventory

**Data Dictionary**

**External entity**

Process: Administrator

Description: Administrator verify type of new reading materials, fix the price and confirm the books’ information to upload new books

Input data flow: Upload confirmation

Output data flow: New reading material

**Process**

Name: 4.3 Confirm all reading material’s information

Description: Confirm the details information of new books like type of book, price

Input data flow: Price of book

Output data flow: Updated reading material

Process: START

Administrator verify type of reading material

Fix the price for the book

Confirm the details information of book

Generate upload confirmation

Upload confirmation by administrator

If CONFIRM

Reading material uploaded

Else

Repeat process until successfully confirm

END Else

END

**Data Flow**

Name: Information of book

Description: Contain details information of book such as type of book, price

Origin/ Source: Administrator external entity

Destination/ Sink: 4.2 Fix a price

Data Structure: Information of books = BookID + Type of book + price + title

Data Element: Name: Book ID

Description: Used to uniquely identify each book in the store

Element Characteristics:

Type: Alphanumeric

Length: 4

Output format: B001

**Data Store**

Name: DS3 Book library

Description: To store the details of books that were uploaded

Input data flow: Updated reading material

Output data flow: Book information

Data Structure: Book details = BookID + type of books + price + title

Data Element: Name: Book ID

Description: Used to uniquely identify each book in the store

Element Characteristics:

Type: Alphanumeric

Length: 4

Output format: B001

**ANDERSON TEY LE TIEN TP076394**

DFD level 1 and Data Dictionary of 5.0 Generate Reports

A diagram of a company

Description automatically generated

**Data dictionary**

**External Entity**

**Name:** Manager

**Description:** Manager ask for monthly report to simplify product management according to the report.

**Input data flow:** Generated report

**Output data flow:** Report request

**Process**

**Name:** 5.3 Print Report

**Description:** Generate a hard copy of summarised monthly income

**Input data flow:** Report

**Output data flow:** Generated Report

**Process:**

START

Check whether report is received;

IF receive report,

Print report;

Send report to Manager;

ELSE,

Wait until report is received;

ENDIF,

END.

**Data Flow**

**Name:** Revenue Request

**Description:** To allow the system to generate a revenue report

**Origin/Source:** Administrator external entity

**Destination/Sink:** 5.1 Calculate Revenue Process

**Data Structure:** Revenue Request = Request ID + Date + Admin ID

**Data Element:**

* **Name:** Admin ID
* **Description:** Used to identify the administrator of the system
* **Element Characteristics:**

**-Type:** Alphanumeric

**-Length:** 5

**-Output format:** AA001

**Data Store**

**Name:** DS2 Order

**Description:** Store the statistics of income by the data of purchase and rental book every month

**Input data flow:** Total revenue

**Output data flow:** Monthly revenue

**Data Structure:** Order = Rental ID + (Purchase ID) + Revenue + Date

**Data Element:**

* **Name:** Rental ID
* **Description:** Used to identify the rental made by users
* **Element Characteristics:**

**Type:** Alphanumeric

**Length:** 5

**Output format:** RT001

**CHEK KA NIC TP074894**

DFD level 1 and Data Dictionary of 6.0 Restock Reading Materials

A diagram of a software process

Description automatically generated

**Data dictionary**

**External Entity**

**Name:** Administrator

**Description:** Administrator checks numbers of stock available and restock reading materials if needed to

**Input data flow:** Invoice and stock report

**Output data flow:** Stock request and restock request

**Process**

**Name:** 6.3 Create restock orders

**Description:** Generate restock ordersand store it upon receiving restock request

**Input data flow:** Restock request and restock confirmation

**Output data flow:** Restock confirmation and restock orders

**Process:** START

Read in restock request

Store restock order into data store

Retrieve restock confirmation

IF restock confirmation is invalid

Resent confirmation for verification

ELSE

Forward restock confirmation to Publisher

END ELSE

END

**Data Flow**

**Name:** New book details

**Description:** Contain information of books, quantity, etc..

**Origin/Source:** Publisher external entity

**Destination/Sink:** 6.1 Verify restock materials

**Data Structure:** New book details = Book ID + Book name + Quantity + Total book quantity

+ Order date + Receiving date

**Data Element:**

* **Name:** Book ID
* **Description:** Used to uniquely identify each book in the store
* **Element Characteristics:**

**Type:** Alphanumeric

**Length:** 4

**Output format:** B001

**Data Store**

**Name:** DS4 Restock order

**Description:** To store the details of books that were restocked

**Input data flow:** Restock orders and stock request

**Output data flow:** Stock data and restock confirmation

**Data Structure:** Restock order = Order ID + Order description + Order total

+ [Payment type]

**Data Element:**

* **Name:** Order ID
* **Description:** Used to uniquely identify each order made by administrator
* **Element Characteristics:**

**Type:** Alphanumeric

**Length:** 5

**Output format:** RO001

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