Sri Lanka Institute of Information Technology

Information Technology Project (IT2080)

ITP_WD_B01_04

Project Proposal

Web Portal/Centralized Platform for Jiffy Products (PVT) LTD

1.	Thilakaratne S.P	IT21018596
2.	Piyumantha W.U	IT21013928
3.	Gunasekara S.N.W	IT21011870
4.	Maharanhindage V.A.R	IT21109126
5.	Shavinda H.K.L	IT21012488
6.	Kumari K.A.D.H	IT21055362
7.	Jayakody D.M.L.D	IT20611088
8.	Siriwardana S.M.K.S	IT21020230

Table of Contents

Background

“Jiffy Growing Solutions” provides sustainable plant growing solutions to innovative and top-tier horticultural businesses so they can feed and beautify the planet. Jiffy Products include substrates, plugs, pellets, and coir products. They assist you in enhancing product quality, efficiency, and sustainability by paying close attention to what you have to say and sharing their knowledge. The primary objective is to reduce waste and maximize the yield, thus making it an eco-friendly company.

Problems

- The current approach to notify order statuses is done through emails which may lead to major inconveniences. Such notifications may go unnoticed, leading to orders not being processed.

- Manual handling of information poses several challenges.
  - This is evident in procedures such as order management and leaves management (where an employee is required to fill in a form that may take several weeks or months to be approved.)
  - Paperwork handling some of these processes can be prone to human errors; papers may end up in the wrong hands or be misplaced
  - It is highly time-consuming and expensive to create reports
  - Inadequate user experience
  - Maintaining backups for a longer period is a bit difficult (storing and safety)
  - Data retrieving and tracking from the related inventory is very difficult

- Employees cannot access and manage their personal information directly without going via HR departments or managers because many current systems do not support employee self-service.

- Another difficulty is that the company keeps all employee information in its corporate headquarters, making it challenging to retrieve employee data from remote locations quickly.

Motivations

- The company's existing manual system will be replaced by a centralized management system that allows for faster and more efficient operations. Anyone with elementary computer knowledge can easily handle it because it provides a user-friendly environment. (The new system is to control the following information: product information, sale information, client information, and factory information)
- Place orders via the computerized system.
- Calculation and generating reports make simpler with the system.
- The new system enables customers and employees to interact with each other easily.
- Using the payment portal in the system is much easier than the manual payment methods.
- With a computerized system, paperwork is drastically reduced, data retrieval becomes easy, and duplication of work is avoided.
  (Helps maintain the details of employees, suppliers, customers, raw materials products, and factories etc, in a computerized manner.)

Aim

To centralize the company activities to improve its efficiency and communication via a web centralized platform.

Objectives

This project aims to offer a thorough method for managing business operations. This will be accomplished by creating and putting into use a web-based, centralized platform that will result in a significant paradigm shift in the manner that management duties are carried out.

Everything has been computerized in this age of advancing technologies. The Human workforce has grown due to the abundance of job options. Consequently, a system that can manage the data from such a massive volume of information is required. Due to its user-friendliness, this project makes the process of managing records simpler.

- Identify the user requirements through observations and interviews/meetings
- Identify potential drawbacks of the existing system and how the new system provide solutions tohem
- Design wireframes and present them to the client to get the feedback and make any changes if necessary
- Acquire necessary information fom the client regarding employees, suppliers etc.
- Draw ER diagrams to identify the highlevel/conceptual model for the database and then develop the relational schema for it.

- Develop the database for the system.
- Develop individual components and get client's feedback time to time to perform any changes if needed. At the end perform unit testing to ensure the componenets work as expected. Once the components are integrated, integration testing could be performed to ensure that the whole system functions as expected.
- Deliver the fully functioning product to the client

System Overview

1. **Order Management (Customer/Supplier)**

   Functional Requirements

   - Viewing the order list received by clients.
   - Accept or reject orders.
   - Both accepted and rejected orders are notified to the respective clients.
   - The client can view their orders (both past and current)
   - The person in charge of managing orders can update the order status
   - Generating reports automatically

   Non-Functional Requirements

   - The web application system should guarantee the accuracy of data recorded in the database for each order.

   Technical Requirements

   - Laptop/Desktop
   - Mobile phone

2. **Customer Management**

   Functional Requirements

   - Customers can create new accounts.
   - The customer can then access the relevant account (by providing user credentials), view and manage account details, orders placed by the customer, and current payment methods.
   - The system can notify the customer about the necessary information related to the account.
   - Accessing and Managing (Update/delete) customer accounts can be done by the site administrators and selected employee roles.

- Site administrators or selected employee roles can generate account usage reports and act against accounts that are not used for a long time.

Non-Functional Requirements

- Customers should be able to use the system easily without having pre-knowledge.
- Customer accounts should have security against unauthorised access

Technical Requirements

- Laptop/Desktop
- Mobile phone

3. Transaction Management (Customer/Supplier)

Functional Requirements

- The system calculates the total amount to be paid and generates E-bill.
- Then the customer can select the payment method and enter the details of that respective method out of bank deposits, credit cards or debit cards.
- Customers can manage the existing payment details/method either by updating details or can remove the records.
- Customers can view their transaction history.
- The company can pay the suppliers using this system when buying raw from them.
- Before doing any transactions, the credentials will be validated by the system.
- When the transaction is completed, the customer gets notified.
- The financial manager can get a detailed report containing graphs representing daily transactions via the system

.**Non-Functional Requirements**

- The transaction process must proceed without any interruption.
- Transaction validation should be less time-consuming.

Technical Requirements

- Laptop/Desktop
- Mobile phone

4. Inventory Management

Functional Requirements

- Find the number of available units of each item (raw materials/finished products)
- View the unit price of each item
- Update stock based on received or removed stock

- View the reorder level of each item
- Search an item(by item name/item code)
- Delete a finished product(if it is no longer needed/produced)
- Generate an item list for a reorder
- Generate inventory report(summary of the amount of inventory the company has on hand at a given time)

Non-Functional Requirements

- The system should be able to update the quantity of inventory items rapidly.
- Report generation should be less time consuming
- The system should have sufficient security to ensure that only authorized users are allowed to access the inventory

Technical Requirements

- Bar code readers
- Laptop/Desktop
- Mobile phone

5. **Supplier Management**

Functional Requirements

- Add new suppliers to the system
- Update existing suppliers' details and delete suppliers if the company does not purchase raw materials from them
- Search for the suppliers when the supplier id or supplier name is given
- Generate supplier lists with relevant details, and a list of products of each supplier

Non-Functional Requirements

- Employees should be able to contact suppliers and place orders easily.

Technical Requirements

- Laptop/Desktop
- Mobile phone

6. **Employee Management**

Functional Requirements

- Display employee details. User with defined roles shall be able display the content of the database.
- A user with employee role can edit his/her specific personal information
- Generate performance review reports

- HR shall be able to generate a report for each employee based on the information in the database
- Add a new employee to the system.
- Delete an employee who has resigned.

Non-Functional Requirements

- The web application system should be able to process 99.9% of requests coming from employees immediately.
- There is no restriction on the number of the employees to be added to the database.

Technical Requirements

- Laptop/Desktop
- Mobile phone
- Fingerprint scanner
- Bar code reader

7. Delivery Management

Functional Requirements

- Display delivery status to customer and delivery manager.
- Receive notifications regarding the delivery status.
- Ability to get feedback about delivery.
- Search bar option to find a delivery with delivery id in delivery manager's interface.
- Filter option for find delivered and pending deliveries in delivery manager's interface.
- Display delivery status history.
- Generate report about customer feedbacks.

Non-Functional Requirements

- Notifications should be sent no later than 10 minutes after changing the delivery status.
- Status update should be quickly.

Technical Requirements

- Laptop/Desktop
- Mobile phone
- Bar code reader

8. Factory Management

Functional Requirement

- Details of a new factory can be added, and details of existing factories can be viewed, modified, and deleted.
- Details of a new machines can be added, and details of existing machines can be viewed, modified, and deleted.
- A particular machine can be searched using the id and name given to the machine.
- Statistics regarding machines can be viewed.
- Reports are generated, including the information regarding raw materials used and productions done in each factory.
- The respective parties are also notified about the statistics of machines, raw materials used, and productions done.

Non-Functional Requirements

- Generated reports from the production and raw material data should have 99.9% accuracy.
- Monitoring machine status helps very much in maintaining machines without being damaged due to high usage.
- Reports must be generated as soon as the month ends.
- Manageability of factory and machine details must be easy.

Technical Requirements

- Laptop/Desktop
- Mobile phone

Literature Review

Existing Solution

"Microsoft Dynamics AX" is a comprehensive enterprise resource planning (ERP) software suite for finance and operations. It assists global enterprises in organizing, automating, and optimizing their processes whether on-premises, in the cloud, or via hybrid deployment. It is a component of Microsoft Dynamics, a collection of intelligent business applications.

[1]

It involves several advantages and disadvantages.

- *Advantages*
    - Microsoft Dynamics AX, as an integrated ERP solution, propels your organization forward by simplifying complex silo data. This allows a user

to obtain a detailed analysis using KPIs and reporting tools. With familiar user interfaces, decision-making is quick and easy.

- Since the subscription plans are monthly/annually, the initial price to be paid is less.

- *Disadvantages*
  - Microsoft Dynamics AX provides different plans/subscriptions to a company intending to buy it. These plans could be monthly/annual. Therefore, when considering the cost factor, the company has to pay on a long-term basis for lifetime usage.
  - Since this is generic software, it provides a plethora of sophisticated functions/features, where some functions/features may not be essential to an organization using it. Thus, there can be potential performance issues.
  - It is mainly a standalone desktop application with limited web and mobile-add-on capabilities. So there is little cross-platform functionality.

Due to the above-mentioned drawbacks, a custom-designed web portal would be beneficial. Since it is targeted solely at the client, there would be minimum performance issues. Although the initial cost of purchasing the web portal is expensive, there are no monthly payments for renewal, except for minor upgrades. Moreover, since it is web-based, the portal becomes cross-platform, where users can access it even using a smartphone. This improves the reliability as well.

In conclusion, the web portal provides self-service for employees, supervisors, and other users. The organization will be able to delegate to individual users the task of viewing and modifying data, and this will radically alter how users, including employees, get information and interact with it.

Methodology

- **Technology**

  MERN Stack for development

  - M – MongoDB

    MongoDB stores data in flexible, JSON-like documents, which means that fields can differ between documents, and the data structure can change over

time. The document model corresponds to the objects in your application code, making it simple to work with data. Ad hoc queries, indexing, and real-time aggregation are all powerful methods for accessing and analyzing data. MongoDB is fundamentally a distributed database, so high availability, horizontal scaling, and geographic distribution are built-in and simple to use.[2]

- E – Express

  Express is a Node.js web application framework that is versatile and lightweight and provides a full range of functionality for both web and mobile applications.

  API - Creating a robust API is quick and easy with a plethora of HTTP utility methods and middleware at your disposal.

  Performance - Express adds a thin layer of basic web application features without interfering with Node.js features.[3]

- R – ReactJs

  React is a JavaScript library used to create user interfaces.

  Declarative - The development of interactive user interfaces is made easier with React. Create straightforward views for each stage of your application, and when your data changes, React will only update and render those components that are absolutely essential. Declarative views improve the predictability, comprehension, and debuggability of your code.

  Component-Based - Create encapsulated components that manage their own state, then combine them to create complex user interfaces. Because component logic is written in JavaScript rather than templates, you can pass rich data through your app while keeping the state out of the DOM.

  Learn once, write anywhere - Because we don't make assumptions about the rest of your technology stack, you can create new React features without rewriting existing code. React can also be used to render on the server with Node and power mobile apps with React Native.[4]

- N – NodeJs

  Node.js is an open-source server environment that is free to use. It runs on a variety of platforms (including Windows, Linux, Unix, and Mac OS X) and employs JavaScript on the server. Node.js skips the waiting and immediately moves on to the next request. Node.js is a single-threaded, non-

blocking, asynchronous programming language that is extremely memory efficient.[5]

NodeJs is capable of doing the following,

- Generate the dynamic page content
- Can create, open, read, write, delete, and close files on the server
- Can collect form data
- Can add, delete, and modify data in your database

- **Tools**
  - *Figma for wireframing*

    Figma distinguishes itself as a powerful cloud-based alternative to tools such as Sketch and Adobe XD. The best part is that it doesn't limit free users, offering a suite of features that work well whether you're a solo designer or part of a larger team. This is an excellent choice if the design team needs a single, simple tool for the entire design process. To brainstorm and map user flows, FigJam could be used, an online whiteboard that works alongside Figma. Wireframing/Prototyping process could then be started without exporting your ideas to another design app.[6]

  - *Visual Studio Code as a code editor*

    Visual Studio Code is open-source, cross-platform, and free. This means that it is compatible with Windows, Linux, and macOS.Unlike many other code editors, Visual Studio Code includes an in-built debugger, which makes the development process less "clicky," and it maintains a single view that includes both code and the debugger.

    These factors make it a perfect alternative to editors like *Sublime Text* and *Atom.*[7]

  - *Jira as a project management tool*

    Jira is a software application used for project management and issue tracking.

    We considered using Jira as a project management tool because Jira is widely used in the industry nowadays. When comparing Jira and Trello(another popular tool), Jira provides kanban, scrum, and sprint boards, whereas Trello only provides kanban boards. Therefore, Jira is a better project management tool than Trello for teams that use agile methodologies.[8]

  - *Git as a version control system*

    Git is a distributed version control system that is free and open source and made to manage projects of all sizes quickly and effectively. Git is easy to use, has a small footprint, and performs quickly. It performs better than SCM solutions such as Subversion, CVS, Perforce, and ClearCase thanks to characteristics like affordable local branching, practical staging zones, and numerous processes.[9]

- **Testing Methods**
  - Unit Testing
    - The smallest testable components of an application, known as units, are separately and independently tested for appropriate operation as part of the software development process is known as unit testing. Software engineers usually write and execute unit tests, which are automated. Unit testing's primary goal is to separate written code for testing to see if it functions as expected.[10]

  - Integration testing
    - Integration testing is the second phase in software testing in which individual software modules are combined and tested as a group. Main objective of integration testing is to determine whether a system or component fulfills with a list of functional requirements. Integration testing is done before system testing and after unit testing. [11]

Work Breakdown Structure

Student ID Number	**Name**	**Function**
IT21018596	Thilakaratne S.P	Order Management
IT21013928	Piyumantha W.U	Customer Management
IT21011870	Gunasekara S.N.W	Transaction Management
IT21109126	Maharanhindage V.A.R	Inventory Management
IT21012488	Shavinda H.K.L	Supplier Management
IT21055362	Kumari K.A.D.H	Employee Management
IT20611088	Jayakody D.M.L.D	Delivery Management
IT21020230	Siriwardana S.M.K.S	Factory Management

Gantt chart

Activity	Start date:2022/07/11								End date:2022/09/17					
	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Find the Client and Planning														
Submit the Charter document														
Agile activity submission														
Create project proposal														
Proposal presentation and Viva														
Wireframe designing														
ER and database creation														
Interface designing														
Function development														
Test and fix the vulnerabilities of system														
Presentation of the project to the client														
Report submission														
Final presentation														

References

[1] "Mongodb.com," [Online]. Available: https://www.mongodb.com/what-is-mongodb. [Accessed 11 8 2022].

[2] "expressjs.com," [Online]. Available: https://expressjs.com/. [Accessed 11 08 2022].

[3] "Github," [Online]. Available: https://github.com/facebook/react. [Accessed 11 08 2022].

[4] "W3School," [Online]. Available: https://www.w3schools.com/nodejs/nodejs_intro.asp. [Accessed 11 08 2022].

[5] "zapier," [Online]. Available: https://zapier.com/blog/best-wireframe-tools/#adobexd. [Accessed 11 08 2022].

[6] "tabnine.com," [Online]. Available: https://www.tabnine.com/blog/visual-studio-code-really-the-best-code-editor/#:~:text=Visual%20Studio%20Code%20is%20free,view%20with%20code%20and%20debugger. [Accessed 11 08 2022].

[7] "nira," [Online]. Available: https://nira.com/trello-vs-jira/#:~:text=Jira%20offers%20kanban%2C%20scrum%2C%20and,best%20agile%20project%20management%20tools.). [Accessed 11 08 2022].

[8] "git-scm," [Online]. Available: https://git-scm.com/. [Accessed 11 08 2022].

[9] "productplan," [Online]. Available: (https://www.productplan.com/glossary/jira/). [Accessed 11 08 2022].

[10] "techtarget.com," [Online]. Available: http://www.techtarget.com. [Accessed 11 08 2022].

[11] "Microsoft," [Online]. Available: https://dynamics.microsoft.com/en-us/ax/#sort=relevancy&f:@version=[Microsoft%20Dynamics%20AX]). [Accessed 11 08 2022].