



4.3P GR7

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Naurin Afrin | Friday 12.30

SWE30010 Development Project 2: Design,
planning and Management

Project Proposal: PHP-SRePS

Background

Based in Hawthorn - PHP, or People Health Pharmacy Inc. is a small supplier of various medicine, health care products, and accessories. They currently operate under an inefficient paper-based recording system and are in need of an efficient software solution that will enable them to easily analyze sales data, create reports, and inform management in regard to which items are currently in demand.

As the company increases in size, and the amount of customers increase, using a paper-based recording system/database will become exponentially harder, meaning the company may have to employ and train more workers, which can cut heavily into profits. A digital database and recording system will help streamline record keeping within the company and will enable both old and new records to be found and used easily. Access to electronic sales records will allow reports and analytics to be created with ease, when compared to using paper-based records to do the same. Many companies in the technological age make use of digital database systems, from vastly different fields of work. Examples include grocery stores, hospitals, dentist clinics, accountant firms, and many more. As such, moving forward with PHP's proposal of a digital-based sales system would be the correct move, and has the potential to greatly increase the productivity and profit margin of the company.

Paper VS Digital

Understandably, a paper-based system requires much more manpower and effort to extract useful information out of (such as the aforementioned reports and sales data) than a digital system. There are many advantages to using a digital software-based sales system in the current technological age. Some of these advantages are listed below (Cochran, 2015).

- Very low chance to lose data vs a paper-based system
- Software can be written and expanded upon to provide easy to read data and analysis - this expansion can be implemented and continued many years after it is first introduced.
- Generally, a much higher ease of use than paper-based systems
- Digital records can be altered and changed far easier than paper documents
- Digital solutions can automatically perform tasks (such as keeping track of low-stock items) that may be forgotten or missed by employees working under a paper-based system

Our Objective

To create an intuitive, easy-to-use sales reporting software solution in order to increase PHP's productivity and performance. Our proposed solution is further defined under the "Scope" section of this wiki.

Scope

PHP has proposed that an application that analyses sales data, outputting weekly/monthly reports would target the raised issues and improve the business's workflow. A user-friendly graphic interface is requested to ensure that staff can effectively work. Additionally, PHP requires all reports to be CSV supported for further analysis.

The solution must contain the following features:

- Record, edit, and view sales data for pharmaceutical products
- Generate alerts for low stock
- Predict monthly sales for items based on previous sales
- Generate monthly sales reports which can be in CSV format
- Provide access to these features through a graphical interface
- Fully workable application and database system

Some additional considerations:

- The users have been using a paper system, so intuitive UI is important for a smooth transition, and tools for adding many records manually could be useful
- Display Items that are in demand
- Display stock numbers of all items in store
- Clients need more information about monthly sales (to determine demand of items) so this information must be easily accessible and intuitively presented
- Online/Cloud database
- Login system with different permissions
- Training session

Out of Scope:

- Online/mobile access
- Backups/redundant storage
- Data Encryption

Stakeholders

There are both minor and major stakeholders in this project. It is important for our team to keep these stakeholders in mind during development of this project.

Major Stakeholders:

- The client People's Health Pharmacy (PHP), as they have requested this project development
- The client's boss/CEO, as they are responsible for payment
- The development team

Minor Stakeholders:

- PHP customers. They will benefit from this product, as it can predict sought-after items, and therefore PHP will make sure those items are always in stock
- PHP investors, as they may indirectly benefit from this project, through an increase in efficiency at PHP

Deliverables and schedule

- Fully working source code
- Finished Product meeting client requirements
- Clear code documentation for any further maintenance/development.
- Training documentation that clearly communicates system operation and effective use

Initial Release Schedule of the Product backlog items

No.	Item	Dependencies	Business Value	Release Schedule
1	Implement a MySQL database		8	Sprint #1
2	Design UI		6	Sprint #1
3	Add sales records to database	1	10	Sprint #1
4	Edit sale records	3	10	Sprint #1
5	Display sale records	3	10	Sprint #1
6	Display monthly sales report	3	10	Sprint #1
7	Generate a monthly sales report as CSV	3	10	Sprint #2
8	Add item Information (inventory)	1	6	Sprint #1
9	Edit item information	8	6	Sprint #1
10	Display Item Information	9	6	Sprint #2
11	Predict sales of an item monthly	8	10	Sprint #2
12	Predict sales of a group of items monthly	8	10	Sprint #2
13	Alerts for low stock	8	8	Sprint #2
14	Implement sales reducing stock automatically	8	5	Sprint #2
15	Create UI	All above	8	Sprint #2
16	Login system	15	4	Sprint #2
17	Online data sync	14	5	Sprint #2
18	Software information/Hand over	All above	7	Sprint #2

Solution Direction

The team has generated four possible directions for the project: a Java Web or a C#/WinForms local application. Each option presents its own strengths and weaknesses as identified and formatted in the following SWOT analysis tables.

C# - Desktop Application w/ Local Storage

<u>Strength</u>	<u>Weakness</u>
<ul style="list-style-type: none"> Commonly known language among team Local storage is more secure Visual Studio IDE is a fully supported environment we can use for free with C# Numerous libraries that are open source can be used by the team Desktop applications are more secure as they have better administrative control and authorization. 	<ul style="list-style-type: none"> Backups required for local storage Risk of loss of data Updates and Installations must be manually implemented on individual client machines. Cross platform implementation may be difficult and require a lot of planning e.g. developing on MacOS will have different requirements than developing on WindowsOS
<u>Opportunities</u>	<u>Threat</u>
<ul style="list-style-type: none"> Easily converted to CSV format More flexibility in creating a desktop application vs a web application, in terms of design and functionality 	<ul style="list-style-type: none"> WinForms is unsupported

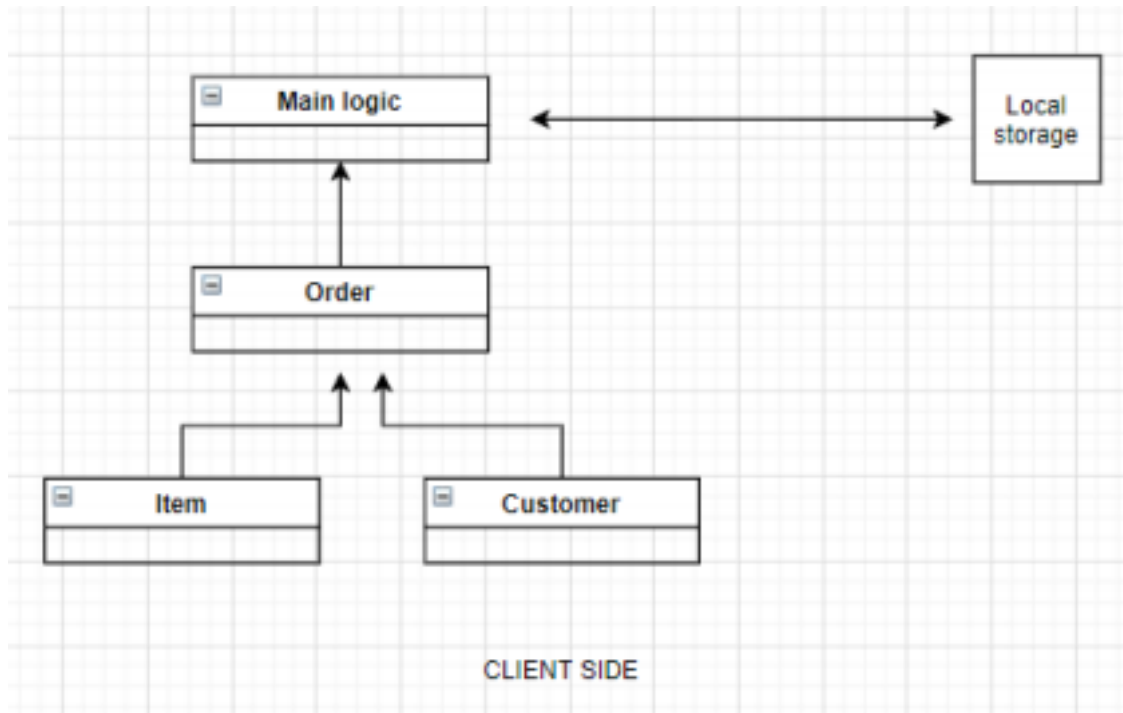
Web Based Java Application

<u>Strength</u>	<u>Weakness</u>
<ul style="list-style-type: none"> Commonly known language among team Local storage is more secure Visual Studio IDE is a fully supported environment we can use for free with C# The application can be implemented across platforms making it more portable. Web applications are better for implementing continual updates as the source code is mostly server side. 	<ul style="list-style-type: none"> Backups required for local storage Risk of loss of data The application can be implemented across platforms making it more portable. Web applications are better for implementing continual updates as the source code is mostly server side.
<u>Opportunities</u>	<u>Threat</u>
<ul style="list-style-type: none"> Easily converted to CSV format More flexibility in creating a desktop application vs a web application, in terms of design and functionality 	<ul style="list-style-type: none"> WinForms is unsupported Important updates such as Security are dependent on the user to be installed.

As a group, we have chosen to commit to creating a desktop application using C# and WinForms. As our database system, we have decided to use local storage as opposed to using MySQL on a web server. We believe this solution will be easier to use than a web server, as information cannot be stolen by outside sources, and it may be easier to use for the technologically inept. We have decided on creating a C# desktop application instead of a Java web application, as everyone in our group has had prior experience using C# and Visual Studio. No one in our group has had past experiences in developing Java. If we use C# and

WinForms, we all have free access to the IDE Visual Studio through Swinburne, which will make coding our solution relatively stress-free in comparison to using Java, where we would have to use another IDE that we might not be familiar with.

Solution Architecture



Element	Description
Order, Item, Customer	Technical details, program classes to be specified in lower level design
Main logic	Handle logic and calculation as well as export data to local storage and sync data to database
Local storage	Can be physical hard drive storage on client machine
DBMS	Third party database management system to handle requests, manage/retrieve/manipulate data

In this project quality is defined by the software's Functionality, Reliability, Usability, Efficiency, Maintainability and Portability.

In regard to a Scrum approach, measuring quality would involve a high level review of the sprints followed by a low level review of the code which would address errors in the code, readability of the code, integrated testing and performance testing.

From the results of low-level testing we would classify each point and feature of the software to.

- No action
- Refer for repair
- Reconsider overall design

Definition of 'Done'

The product will be considered 'done' when the software is in a state where it can be deployed while being considered 'high quality'. The quality will be determined through test cases where the program will be given specific initial conditions and compute outputs accordingly. These outputs from the program will be compared to known results of the initial conditions to check the program is functioning correctly. Ideally the program should pass all tests to ensure complete functionality. However, a more practical approach would be to ensure that the quantity of failed cases is less than or equal to 5% of the total test cases created.

Quality Management

The quality of the software is determined through the product quality model: ISO/IEC 25010. This model outlines 8 key characteristics of a product that need consideration during the development process which include: functionality suitability (fs), performance efficiency (pe), compatibility (c), usability (u), reliability (r), security (s), maintainability (m) and portability (p). By developing software with these characteristics and accommodating the needs of the client (outlined in the scope in 2.2P), the software can be deemed 'high quality'.

Below are some points of a quality control checklist that relate to the client's needs and the above characteristics:

No.	MSCW*	Characteristics of the ISO/ICE 25010 Model	Requirements of the Software	Methods to ensure the software's functions are reliable
[1]	M	Fs, u	Generate monthly sales reports which can be in CSV format	Test cases which can verify the conversion is in the right format
[2]	M	Fs, u	User-friendly graphical interface	Present the interface to people outside of the development team to ensure it is easy to follow. Adoption should not exceed 15 minutes.
[3]	M	Fs, m	Record, edit, and view sales data for pharmaceutical products	Develop tests with edge cases that have known results, to ensure the same result is obtained through the program
[4]	M	Fs, u	Generate alerts for low stock	Tests where stock is set to be intentionally low in order to determine if an appropriate alert is shown
[5]	M	Fs, u, m	The program can perform predefined mathematical operation on existing data to predict monthly sales for items based on previous sales	Develop tests with normal and edge cases with a previously known result to ensure the program predicts accurately
[6]	M	Fs, pe, u, r, s, m, p	Fully workable application and database system	Test the program on different machines (of the same operating system) to a 90% success rate using unit/integration/system tests
[7]	M	Fs, u, m, r	Display Items that are in demand	Develop test cases where items are set intentionally high, in order to determine if the appropriate items are displayed
[8]	M	Fs, u, m, r	Display stock numbers of all items in store	Test cases where the display command is executed, and all appropriate items are displayed
[9]	W	Pe, m, r, s	Online/Cloud database	Test cases to ensure the data is stored without corruption and effectively
[10]	C	Fs, r, s	Login system with different permissions	Test cases where users with varying permissions attempt to access unauthorized data and are rejected
[11]	W	u, m, r, c, p	Mobile access	Test cases where the program is run on mobile devices to ensure it has the same effectiveness and user-friendliness as its Windows version
[12]	S	Pe, m, r, s	Backups/redundant storage	Test cases to ensure the backup storage contains the same data as the primary storage (without corruption)
[13]	C	Fs, s	Data encryption	Data cannot be accessed by undesired personnel
[14]	M	Fs	Local storage	The program can take input and store it in local storage
[15]	S	Pe	Low resource demand	RAM used while running: <100MB & Executable file is less than 50MB in size
[16]	S	r	Exception Handling	Display appropriate error messages when required
[17]	S	p	Portable system	The program contains 1 executable file and is supposed to run on its own without any third-party library installed

No.	MSCW*	Characteristics of the ISO/ICE 25010 Model	Requirements of the Software	Methods to ensure the software's functions are reliable
[18]	M	Fs	Report History	Previous records can be viewed in manageable quantities, and as far back as the history goes.
[19]	C	u	Data Visualization	Graphs generated are clear and easy to understand
[20]	S	m, r	Full refactoring to ensure optimized code.	Upon completion of refactoring, the team will check over and approve the optimizations.
[21]	C	m	Documentation	A full, detailed operations manual must be developed, and appropriate commenting standards should be used
[22]	S	Fs, u	Startup	Product must be able to run on a desktop computer, with an executable file to launch the program.
[23]	C	u	Training session	Staff should be able to work the application at the conclusion of the training session

*MoSCoW represents MUST, SHOULD, COULD, and WON'T

Resources

101131147 | Monique Kuhn – Team Leader

101111372 | Jake Scott – Team Member/Programmer

102259710 | Tien Phu Ngo – Team Member/Programmer


101100655 | Lachlan Burns – Team Member/Programmer






102095118 | Jayden McQueen – Team Member/Programmer

102079989 | David Stare – Team Member/Programmer

Approval Signatures:

Project Team

	Name of student	Student Id	Signature
1	Monique Kuhn	101131147	

2	Jake Scott	101111372	
3	Tien Phu Ngo	102259710	
4	Lachlan Burns	101100655	
5	Jayden McQueen	102095118	
6	David Stare	102079989	

Project Sponsor [Your Tutor]

Tutor's name (on behalf of the client)	Signature:
Naurin Afrin	

Reflection**101111372 | JAKE SCOTT**

The team has been fairly happy and unified in our decisions so far, meaning the compilation of the reports went smoothly, with no need for any large changes or additions

102259710 | TIEN PHU NGO

After completing all the required tasks, the team is ready to submit our final project proposal. We are working well as a team; everything went as planned and I think the team is ready for sprint 1.

101100655 | LACHLAN BURNS

This task done by Jayden and Jake reads well and compiles all of our previous tasks into one easy to read document, it is a good representation of where we are at as a team and believe we are now ready to begin programming.

102095118 | JAYDEN MCQUEEN:

For this task, I compiled the previous group tasks into one large complete document. I also added a few extra sections that were not from previous weeks, the 'shareholders' section, the 'resources' section, and the

'approval signatures' section. I am happy with the final document, and believe as a group, we are ready to proceed into the first sprint.

101131147 | MONIQUE KUHN

This particular task was handled by Jayden and Jake, it was great to see these team members work independently as the remainder of the members focused on 4.2P. A read through the document gives me confidence that the team is ready to move forward into the first sprint.

102079989 | DAVID STARE

Jayden and Jake had individually compiled all the work done by the team into a concise document that can be submitted as a project proposal. The team is happy with their work and agree all the necessary stages for a project proposal are completed.