**Merged Document**

**Pre-Internship Assessment**

**Business Analyst**

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By : Himasha De Silva

***Mission J***

**Point of Sales System**

Throughout the ages, humans engaged in exchanging things. That act has been evaluated till today. At first, humans used to exchange goods with each other for other types of goods for example they exchanged a bag of dhal for a bag of rice. After that, they shifted to the thing called "money". At present nothing can be done without it. But it uses the same base of exchanging things with one another. Sell things for money and from the money they buy the things they want.

The cashier such as all the transactions that take the place can be defined as the point of sale (POS) or point of purchase (POP) system.

At the point of sale, the vendor figures out how much the customer owes indicate that amount and that customer made the payment in exchange for goods.

Though in the current era with the development of the technology we have got what is known as mobile point of sales Systems, traditional POS systems simply referred to the store’s cash register, with manual work got a major place.

Starting from paid to free POS software is completely digital and reduce the manual workload once processed.

[1]

**How the POS system works?**

A point-of-sale system is made up of both hardware and software. And a business configuration will determine whether you need to purchase both hardware and software. As an example, when discussing about the differences between running for a online clothing store and a physically stored clothing shop. At 1st stage you can find many hardware components such as cash registers, monitor screens, barcode readers, etc.

At a online store you only can find softwares that do transactions. [2]

**Types of POS**

Mobile Point-of-Sale

A mobile POS system(mPOS) is a system that uses electronic devices such as a smartphone, tablet, or other mobile devices to handle payments and may also include features like inventory management, loyalty programs, sales tracking, reporting, and more. It's a device to which a credit card reader can be attached. It's lightweight and versatile, allowing you to connect to other devices like barcode scanners and receipt printers.

Tiny enterprises and entrepreneurs, as well as small retail stores, pop-up shops, and quick-serve restaurants, will benefit from these methods. mPOS systems are small and compact, as well as economical and convenient. [3]

POS (Point of Sale) Terminal

In a terminal POS system add-on peripherals like barcode scanners, Credit card readers, receipt printers, and cash drawers are all available options. IN this systems Inventory management, reporting and analytics, payment receipts through email, CRM, and customer loyalty programs can be done. They come to topic in restaurants, grocery stores, boutiques, book or magazine stores, salons, and electronic stores because of their sophisticated functionality and inexpensive pricing. They're perfect for retail stores with cash wrappers dedicated to cash.

Cloud-based point-of-sale

A cloud POS works with your existing hardware, such as a computer, tablet, and printer. Cloud POS is a web-based or online point-of-sale system. They are the same as POS terminals the difference between them is that a cloud POS system is not installed on a server that you manage

**Features**

Now you have a little knowledge about POS systems , here are seven crucial things to consider when buying one:

1. Billing and order fulfillment

Billing and order processing are the most essential features of a POS system and a POS system needs to be able to bill orders by scanning things and capturing various payment methods.

To make order invoices, reprint them, and email them to the final customer, as well as additional discounts, customer information, additional notes, and the salesperson's name to an order.

2. Stock and inventory management

The inventory management module always must provide the comprehensive visibility and responsibility at the store level.

The system should show inventory by lot, SKU transaction history for 'in', 'out', and 'within' movements of any SKU, as well as incoming and outbound inventory.

To make stock modifications, such as increasing or decreasing stock, while viewing inventory and recording the cause for the changes a stock and inventory management module must be capable

3. Tracking and reporting on sales

A report on sales results must be generated by the POS system. For making reports for takings and outgoings on an hourly, daily, weekly, monthly, and yearly a tracking system must be there in a POS. It will make it easy for vendors to cope with the management of the goods easily

Collecting information about seasonal product demands, sales trends, wasteful product spending and stock management are a few functions of a reporting module of a POS system

4. Returns management across multiple channels

A POS returns the executive module's elements incorporate tolerating cross-channel returns and working with discounts and substitutions from any shop area.

The framework should simplify it to make various returns for similar deal requests at various times. It ought to incorporate data like the justification behind the return, the name of the sales rep, and any remarks.

5. Customer experience and relationship

By recording client information and buying history, a retail location framework can assist you with holding customers. This can be used to give your clients a more custom-made insight.

Client information is critical for publicizing since it can uncover which clients are probably going to be keen on your item. Sending a "30% off on huge shirts" deal flyer to a medium-sized customer shirt, for instance, would be a misuse of exertion.

6. Employee supervision

Many individuals are astonished to discover that a POS framework might be used to oversee staff. Nonetheless, a POS framework's worker the executives element can help you in dealing with your staffing levels, representative hours, and deals execution, permitting you to follow worker usefulness.

You can monitor your representatives' exercises by binds every exchange to them. This can help you recognize great and awful entertainers so you can do whatever it may take to support their efficiency.

7. Gift cards and loyalty programs

Rather than utilizing punch cards, you may now follow client dependability motivators utilizing your POS framework.

Gift voucher deals are expanding each year, so your POS framework should have the option to deal with them too.

[4]

The present retail location frameworks accomplish something beyond process deals. As you've found in the past segments, an element rich POS can assist you with supporting your usefulness by expanding proficiency and giving bits of knowledge. These are the justifications for why you should do the change to a POS situation at this moment. Perceive how a cloud-based Point of Sale framework from Vinculum can assist you with doing that.

A group of people in a room

Description automatically generated with low confidence

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***Mission L***

**Old COOP POS System**

Following the instructions given for the mission L I have contacted Mr.Nisith. He was very friendly during the work and gave me a lot of information about the old COOP POS system. First, he described what is a COOP POS system as a corporative point of sale system very clearly . While discussing about the old system of point-of-sale systems provided by SSIPL to shops in these cooperatives he told me that the POS they are currently doing is standard alone. Providing POS systems island widely and make them work properly is a great service done by SSIPL though some old versions make that service bad.

What is a Standalone POS?

Since there is not any integration with other platforms, the "Standalone POS" is not a viable option, but it does offer these fundamental qualities of a simple, efficient POS:

\* Invoicing: Selling, Buying, Renting, and Repairing.

\* Integrated Supplier Purchasing.

\* Customer Orders and Suppliers Orders Management.

\* Muli-Store Management.

\* Consistent and Customizable Reports.

\* Inventory Management.

[1]

This old COOP POS users are using the system which is running on local Databases. Since they are not standalone, updates should be done by workstation to workstation separately which will take more time and effort , if the database corrupted and client couldn’t not backup to a external memory caused by a hardware issue all the data will be lost and will not able to receive. So this old system is not secured with the database. And it will cause a loss a of data

And on the other hand, the standalone pos can not be monitored Systems location wisely. Types of data maybe different with other systems. Therefore, track the databases which will have to setup locally and analysis the information is not possible. It will cause unnecessary problems and mixing of data throughout the system

Everything has two sides so this system must have another side. Previously we have discussed about the disadvantages of the system, now let’s discuss about advantages of this system

Features of the system :

* Sinhala language is used in the system’s UI s and all the other modules .Due to this feature a local user can input data without a language knowledge of English easily without any doubts.
* They can create a separate user account for individuals
* User privileged. A user who has been granted permission (and thus may be trusted) to conduct security-related tasks that ordinary users are not permitted to perform.
* Multiple transaction methods are available in the systems providing users the ability of doing transactions using vouchers, credit/debit cards and money. Databases of the system can be backup and exporting reports into pdf files and excel files.
* Even if someone need to get a hard copy of a report, they’d need to get a pdf file or a excel file in order to do this. All the corporative form set is available in the POS system.

Some examples for Reports and Forms that can be generated:

16B - GRN ( Good Receive Note)

.The invoice sent by a supplier to a customer

F18 in & out

. Where the Registrar is fulfilled that it is fundamental in the public interest or in light of a legitimate concern for the co-usable development, or to get the appropriate administration of any general public, that at least two social orders should amalgamate or any general public ought to be partitioned to frame at least two social orders or should be revamped then, at that point, despite anything contained in the last going before segment yet dependent upon the arrangements of this segment, the Registrar may, subsequent to counseling such bureaucratic culture as might be told by the State Government by request informed in the Official Gazette, accommodate the mixture, division or rearrangement of those social orders into a solitary society, or into social orders with such constitution, property privileges, interests and specialists, and such liabilities, obligations and commitments as might be indicated in the request.

No structure will be made under this segment, except if a duplicate of the proposed request has been sent in draft to the general public or every one of the social orders concerned.

The Registrar has thought of and made such changes in the draft request as may appear to him alluring in the radiance of any ideas and protests which might be gotten by him inside such period (not being under two months from the date on which the duplicate of the request as aforementioned was gotten by the general public) as the Registrar might fix for that sake, either from the general public or from any part or class of individuals thereof, or from any bank or class of leasers.

The request alluded to in sub-segment may contain such accidental, noteworthy, and supplemental arrangements as may, according to the Registrar, be important to give impact to the blend, the division or rearrangement.

Every part or lender of 1[or other individual intrigued in every one of the social orders to be amalgamated, partitioned or revamped who has protested the plan of blend, division or redesign, inside the period determined, will be qualified for get, on the issue of the request for combination, division or re-association his portion or interest on the off chance that he be a part and the sum in fulfillment of his due assuming he be a leaser.

F17 – Price increase , decrease and damage

F15 – Tracking the movement from a stock take date to the next stock intake date ( daily report )

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***Mission M***

**Advanced Features of POS Systems**

1. Touch screen options in POS systems make use of inputs easy and clearer without a doubt. Touchscreen POS systems allow users to operate on desktop or mobile devices and allow you to step out from behind the counter and bring the checkout to your customers.
2. The cashier management function in a POS system allows one to track cash transactions and do whatever a normal cash register is capable of. But the advantage is you can get more detailed POS reports during the transactions.

1. Return in the POS system for refunding represent the flexibility of the POS system. This function will allow a customer to refund their items and or even at the same time they will be able to exchange the bought item for another.
2. At the same time the customer will be able to pay the bills in more than one method.
3. Inside a business valuing the customer is a great way to improve the business and it will help the business to get the attention of the traffic. And it will inspire their customers to return to their business, again and again, other than using a cash register or a manual exchange method a POS can do this function efficiently.

Loyalty programs will allow a business to reward customers with loyalty points for each purchase and provide detailed analytics about the customers. You can create custom rewards for your customers that they purchase using points plus money. This function also can be done using software like Blitzly but the POS system itself provide the loyalty programme without taking a commission. This feature is is a part of customer management.

1. User profiles that will allow the company to track the transactions done by a customer are the best functionality provided by an advanced POS system. While working as a business you'll have multiple people working with your registers. To track each of their progress you will need a system that allows you to create a user for each of them. This feature will make it easy to distribute the work among all workers and this feature will also make it easy to cope with the workload.

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1. Warehouse management will provide the business with the ability to organize the business, whether it’s an online business or a physical business a warehouse management system will allow the company to track the exact status of a business item and track the stock in realtime.
2. You can see the status of the stocks in different locations in real-time. The inventory components of the system can be checked using a web-based system from anywhere anytime on this dashboard. The warehouse management system will keep track of all of your products and even help you see which products are available. Using a dashboard Supermarkets can set different targets for each cashier.
3. Due to the system is web-based, data synchronization is done here. When the database whenever it’s connected to the host and will sync with the server
4. Accounting integration is also there in the advanced POS system. Daily basis or monthly basis and the data found in the POS system should be taken for accounting activities
5. APIs should be there in a POS system directly integrate with other systems to get data and for mobile support for specific tasks ( you can access the pos systems for mobile )
6. The best way to enhance a self-checkout system is connecting it with a POS system. Integrating your point-of-sale system with your payment processor eliminates the need to manually key in transaction data at checkout. When your POS and payments solutions are tightly connected, your cashiers no longer have to enter the sale amount and you can shop over your mobile. It will allow data to flow smoothly from one system to the next

Integrating Sells checkouts with a POS system also minimizes human errors and confusion, so the business team can do their work easily.

1. The ability to physically shop with the shopping card when will no cashier will involve and the customer can payout with the debit od credit card. Using barcode scanners will make the payment easy if the company use it causes at present everyone got a mobile in their hand, they can simply do the payment using it. But in here the customer can cheat.

***Mission N***

**Questionnaire**

1. What about the customers’ reactions at the cashier?

2. How long did you start the company?

3. Do your company has software for the point of sale or is it done manually?

* If manual, what are the difficulties you are facing?

4. Can you manage rush hours? And why can’t?

5. Can you describe, what are you expecting from a POS system?

6. Have The existing system has been able to satisfy your needs?

7. As you wish, what are the features that should be updated to make the transaction easier?

8. Did you have another system before the current one?

* If yes, what are the differences between this system, how it has been developed?

9. What are the consequences of this pos system?

10. according to you what are the things that the developers could not achieve?

***Mission O***

**Interview**

I could interview three clients of SSIPL, and this document is based on their responses of them.

**Questionnaire**

1. What about the customers’ reactions to the cashier?

2. How long did you start the company?

3. Do your company has software for the point of sale or is it done manually?

If manual,

* what are the difficulties you are facing?

4. Can you manage rush hours? And why can’t?

5. Can you describe, what are you expecting from a POS system?

6. Have the existing system has been able to satisfy your needs?

7. As you wish, what are the features that should be updated to make the transaction easier?

8. Did you have another system before the current one?

* If yes, what are the differences between this system, how it has been developed?

9. What are the consequences of this pos system?

10. according to you what are the things that the developers could not achieve?

First Client: COOP manager of Pollaththapitiya

1. What about the customers’ reactions at the cashier?

She also stated that there are no issues to be found because the transactions are correct. But the busy hours are a little bit harder to manage.

1. How long did you start the company?

She could not answer the question as a date but answered roughly as more than five years

1. Do your company has software for the point of sale or is it done manually?

They have

* If manual, what are the difficulties you are facing?

-

1. Can you manage rush hours? And why can’t?

Yes, they can.

1. Can you describe, what are you expecting from a POS system?

To serve the customer quickly and accurately

1. Have the existing system has been able to satisfy your needs?

She said that “ yes indeed”

1. As you wish, what are the features that should be updated to make the transaction easier?

Nothing yet but if they suddenly got an idea, they are contacting the developers

1. Did you have another system before the current one?

There was not anyone.

* If yes, what are the differences between this system, how it has been developed?

-

1. 9. What are the consequences of this pos system?

                   A lot of work from stock to the transaction could be done easily as expected.

1. According to you what are the things that the developers could not achieve?

There was nothing yet.

Second Client : “Kehelella Achini”

1. What about the customers’ reactions at the cashier?

She said that there is no issue finding since the transaction was accurate. Since the GRN is done by them, if a customer ordered a newly came item it is problematic cause 16B is not done at the moment.

1. How long did you start the company?

Not answered

1. Do your company have software for the point of sale or is it done manually?

They have

* If manual, what are the difficulties you are facing?

-

1. Can you manage rush hours? And why can’t?

Yes, but to satisfy customers they have to works a bit quicker

1. Can you describe, what are you expecting from a POS system?

The main thing is to generate the receipt for the customer as soon as possible. And also, data management, security, reliability, easiness, all other reports generating

1. Has the existing system has been able to satisfy your needs?

The existing system has been able to satisfy the client’s needs

1. As you wish, what are the features that should be updated to make the transaction easier?

She told that when they are taking stocks in they have to close the market for two or three days to enter data into the database. It has become a great loss. And they are going to update their system with a mobile application that can enter the data by the barcode and by the quantity. The new system is an updated one to web-based.

1. Did you have another system before the current one?

Yes. By a system done by Prime Engineerings

* If yes, what are the differences between this system, how it has been developed?

Here they are using a thermal printer and previously used a dot matrix printer.

That caused the delayed bill generation.

1. What are the consequences of this pos system?

As she told me, at the beginning due to the lack of knowledge of using the system they have faced many difficulties.

A lot of work from stock to the transaction could be done easily as expected.

1. According to you what are the things that the developers could not achieve?

Nothing to tell at that moment.

Third Client: Mr. Dilshan from Wennappuwa

1. What about the customers’ reactions at the cashier?

Not so many problems because of the system.

1. How long did you start the company?

  -

1. Do your company has software for the point of sale or is it done manually?

They have

* If manual, what are the difficulties you are facing?

-

1. Can you manage rush hours? And why can’t?

Yes

1. Can you describe, what are you expecting from a POS system?

Customer satisfaction include discounts, GRN, maintenance of the stock, calculating the profit

1. Have the existing system has been able to satisfy your needs?

The existing system has been able to satisfy the client’s needs

1. As you wish, what are the features that should be updated to make the transaction easier?

Told that the managers should be well advised on how to use it.

1. Did you have another system before the current one?

Yes. Before this system, they had two others.

* If yes, what are the differences between this system, how it has been developed?

That system was a VB one and the existing system from Java

1. What are the consequences of this pos system?

He also highlighted the point of the lack of knowledge to manage the data. Other than that, as a system, there is not any problem.

1. According to you what are the things that the developers could not achieve?

Nothing to tell at that moment.

***Mission P***

**Interview Of “ Lahiru Family Super”**

In order to mission P, I researched a supermarket that is medium-scaled. It is called “Lahiru Family Super”. Which is located at the address of No 106, Dambokka, Boyagane. Only the owner and the cashier person is in there. When answering my questions, the owner’s response was as the following,

1. What about the customers’ reactions to the cashier?

He asserted that there is not much to say, but at the status of not updated details, sometimes the transaction may not be accurate. It will be problematic and losing the customer attention towards the company

2. How long did you start the company?

More than 10 years from the small step.

3. Do your company has software for the point of sale or is it done manually?

They had the manual system also.

If manual, what are the difficulties you are facing?

all the things are messed up and they faced many issues while calculating the bills also.

4. Can you manage rush hours? And why can’t?

According to him, the biggest shop in the village is the “Lahiru Family Super”. Because of that, it has a big customer base. Though the customer is given the receipt somehow, due to the loss of attention, some blockages in the stock will arise and problems will have to be faced.

5. Can you describe, what are you expecting from a POS system?

He thinks that only bill generating would be done there and nothing expected more than that

6. Have the existing system has been able to satisfy your needs?

In order to him, he is totally satisfied with bill generation very much. But once, he said it is better to have stock management.

7. As you wish, what are the features that should be updated to make the transaction easier?

He said that it is better if the customer can see the bill calculation while the data is input.

Then, the customer can view whether they are calculating with errors or not.

8. Did you have another system before the current one?

There was not.

* If yes, what are the differences between this system, how it has been developed?

9. What are the consequences of this pos system?

Though the system is very simple, the handler is not able to manage it properly sometimes.

10. according to you what are the things that the developers could not achieve?

He has no clue

***Mission Q***

**Project Proposal**

**POS System**

**for**

The Supermarket

**Lahiru Family Super**

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Submitting by:

Himasha De Silva

# **Abstraction**

“Lahiru Family Super” supermarket is owned by Mr. Upali Senawirathne and it located at Kurunegala district. This was established more than ten years ago and only one employee is working except the owner. All activities at the point of sale are done with a simply developed POS system which can only generate the bill and do the calculations since it started recently. Due to the current economy of the country even a little mistake affects. So, method is becoming inefficient due to calculation mistakes, improper storage of stock and transaction details, and huge space is occupied by storing files and misplacements also occurred. As the client requirement, we decided to computerize all the manual activities of the supermarket including the stock. Cash counter management, daily sales management, stock management, product management, credit card processing and trial balance and will be our functions that we choose to handle in this system. This system will increase efficiency, performance, and security of the supermarket. This system will be built using Java programming language and MySQL as the database management platform. Point of sales(POS) system will be a desktop application

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# Introduction

Lahiru Family Super Supermarket is a leading mall located at Boyagane, Kurunegala district Sri Lanka. Which sells all the kinds of items. History of the supermarket extends up to more than 10 years. Even though the supermarket has no online selling platform, website or social media, up to date supermarket is popular among the villagers due to its high-quality services provided. Currently, there is only one employee working in the shop. The owner and that one employee handle the cashier in shifts.

But, since the beginning of the supermarket all documenting and the other activities such as giving receipts done manually. Recently they had set up a software which can only do the cashier management. Since it handles only bills, they have many problems at the moment. This have caused many space issues inside the premises as many files should be stored.

And it is noted that retrieving, updating and adding the stock records have become time consuming and sometimes wrong information is shared. Furthermore, there seems to be customer satisfaction issues as well. Considering all the following conditions, we suggested to develop a POS(Point-of-sale) System to “Lahiru Family Super” to overcome issues which they have faced up to date.

So that all the data will be computerized instead of storing in files, which reduce time for paperwork. And everything will be stored in a database.

By using our system, Supermarkets could get number of benefits and accurate results for their issues.

Through this proposal we discuss the problems, our solutions to solve the problem, key benefits they could achieve by using our proposed system, objectives, procedures, system requirements and budget including a schedule for completing our task with a clearly mentioned time period.

## Problem Specification

Though the existing point of sale system provides the relevant cashier management, it would not be able to

real-time reports, automatic processes, and algorithm-based stock allocations. Therefore, the user has to hunt around looking for numbers or spend hours on time-consuming tasks.

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Retail business owners often spend so much time on administration work when they don’t have to. This circumstance gets the employee working on the business, not in the business

Stock controlling is the most difficult functionality. Since they have no digitalized system, all the documentation are written. The company itself has to face challenges due to some wrong documentation and misplacements.

And also, a massive amount of space in the premises

wasting for documentation.

Employees find some unsafety because of the stock’s missing.

On the other hand, the owner lost since anyone can cheat with this improper management.

Decreasing the business traffic is another fact.

Customers are reaching towards other malls due to unsatisfactory.

It has become challenging to get the reports manually without errors. Even one mistake may occur.

## Solution Outline

* After analyzing the current system of the supermarket, we will be using Business Process Reengineering as the fundamental analysis strategy.
* Through the re-engineering the system we will be trying to produce an efficient, secure and an error free system for our client.
* Furthermore, this will be and standalone desktop application system.
* Only the Cashier person and the owner will be our system users.
* Below mentioned functions six are cash Payment processing, customer relationship management, transaction management, Sales reporting inventory management.

Payment processing :

* Add a payment
* Update the payment
* Multiple transactions are accepted
* Deducting the discounts by collecting points
* Forefront of payment solutions

Customer relationship management

* Add a “loyalty customer”
* Remove “loyalty customer”
* Update the details
* Calculate the points

Transaction management

* Doing transaction(adding the transaction and do the calculations)
* Navigable inventory database
* issuing receipts
* Delete transaction

Sales reporting

* selling products Report ,
* Report of the margins
* Report of money make from month to month
* inventory management
* Set reminders to reorder
* Report of Products coming in
* Report of Products going out
* Delete Items
* Add new Items
* Report of existence
* Update quantities

Inventory management

* Set reminders to reorder
* Report of Products coming in
* Report of Products going out
* Delete Items
* Add new Items with suppliers
* Report of existence
* Update quantities

User management

* Create user
* Update details
* Delete user
* Calculate the Targets completed

Diagram

Description automatically generated

Figure High level architecture diagram

## Key Benefits

* To the user and the customer,
* Improved Inventory Control
* Invoicing Made Simple
* Payments are made quickly
* Improved Customer Service
* Improved Customer Order Management Improved Purchasing/Supplier Order Management
* Improved Customer Service
* Customer Satisfaction and Loyalty Improved Security
* Improved Management of Employees
* Promotional Management That Works
* Better Customer Service
* Improve your company's image with better organization.
* Updates on a regular basis
* 24/7 Data Availability
* Operational simplification
* Customer Purchases Are Personalized
* Notoriety has grown
* Errors are reduced
* Increased efficiency
* Increased Revenues
* Timesaving
* Cost Reduction
* Reports that are more advanced
* Multiple transaction methods
* Technical and technological assistance

# Objectives

POS systems, in brief, aim to automate as many of a retailer's financial procedures as feasible. Retailers get smoother operations and greater information on which to base critical business choices by improving information reporting accuracy. Retailers can lower the cost of record-keeping and information collection by minimizing the number of worker hours required to obtain such data. Similarly, expenses are decreased since retailers have more up-to-date information on purchasing habits and inventory levels, as well as greater accuracy in pricing charged to customers.

General accomplishments:

The new system which is proposed to install offers solutions to all the struggling parts in the present system

• This help to prevent the loss of documents so that the “Security” of the system could be achieved

• Save time by making it easy to manage the company data this would help to increase the

efficiency of the system which will also improve the performance of the employees

• Company could reduce cost for paper and storage and instead invest on new equipment’s.

• The system will minimize conflicts that occur in the inventory and company accounts by

keeping the information in separate records for each. In this case, the company can fulfil the

customer and our client’s needs including report providing and the getting discounts.

• Furthermore, the data will be retrieved correctly better than the manual system. The

efficiency of the services may attract more customers and increase the demand of the

company.

• This new system will be available 24/7.

Finally, the general objective of the point-of-sale system will provide an accurate, efficient and available system, so that supermarket activities will be simpler compared to the manual system

Specific accomplishments:

According to our client’s requirement, we have divided the specific accomplishments into six segments as follows:

* Payment processing

When most people hear the phrase POS system, they immediately think of payment processing. This is the most important function for most firms with a POS system.

A POS system can help with a transaction in a variety of ways. Online debit card and credit card processing is the most basic payment processing capabilities. E-commerce businesses can use point-of-sale systems to generate revenue from online transactions.

Then there are the traditional enterprises. Credit card readers with the ability to accept numerous forms of credit card payment will be required in these types of establishments.

And also in here, the user can Add payment and

Update the payment. While doing the payment by considering the loyalty points merchant can deduct the discounts from the total.

By the Forefront of payment solutions, the trust of the customer can be increased

* customer relationship management

Customer management and data tracking are excellent ways to increase brand loyalty for your company. POS systems can save data that helps you build a stronger relationship with your consumers.

For starters, you can provide discounts to repeat consumers or create a customer loyalty program. Customers will return to your business more frequently as a result of more positive and personalized experiences.

So, in here, we can do adding a “loyalty customer”

removing “loyalty customer”, updating their details and calculating the points

* Transaction management

This involves things like maintaining an easily navigable inventory database and providing receipts. You'll also need to be able to print a receipt for each transaction. And when doing the transaction, it would be added as and the transacted update the inventory by deducting the quantity.

The user can delete a once done transaction after entering the reason. It will be a reason to deduct 15% of the employee’s target allowances.

* Sales reporting

POS systems are a useful tool for tracking the company's success. POS software can keep track of key business data and generate reports that can help user assess their financial situation.

Modern point-of-sale systems allow you to generate reports that can assist you in making more informed business decisions. These reports can help to enhance the business operations and streamline a path to profitability by leveraging sales data.

Reporting capabilities can assist to figure out which products are selling, how much money you make month to month, and what your margins are. In today's world, staying ahead of the competition requires a data-driven approach to business.

* Inventory management

Inventory management features are a must-have for any company that sells products. POS systems can help the user to keep track of what's coming in and what's leaving.

The point-of-sale system will allow setting reminders to remind the employee when it's the perfect time to restock goods.

You'll need to keep track of inventories in real-time and keep an eye on inventory levels. You can optimize your product line and focus your efforts on increasing your business by monitoring exactly how many things are coming in and out. In this function, the user can generate a report of Products coming in and going out.

There is another Report called Report of existence which contains the names, quantities and the cost. Moreover, here the user can add new items and delete existing items. Damaged stock is going to another interface and there you can also do updatings and deletions.

The owner can work with the secured system without any fear.

This function only can be accessed by the owner.

* User management

Our system has already created one account for the owner. A user account can be created only by login into that account to protect the details of the company from unknown parties.

Any existing user can delete any person from the system without the owner.

And the system calculates the targets completed by each login and adds 5% of the salary to the salary and display how much they earned at the moment.

# Procedure

After understanding and analyzing our client’s requirements, we have planned to model the

POS system using Iterative waterfall methodology due to following reasons:

* Software requirements are clearly and precisely defined (Well known)
* Product definition is stable
* All tools and development technology are known
* This system is not a risky project
* We could go back into phases and make changes in the project and finally as the
* Project always moves forward with the customer feedback.

Furthermore, using this methodology is more advantageous because errors could be detected and fixed early due to feedback path the model process. [1]

Diagram, waterfall chart

Description automatically generated

Figure Iterative waterfall model

## Flow of the project

The Flow of the project will happen according to the Iterative waterfall methodology as mentioned in the procedures section. So as the first step we conducted a requirement gathering about the supermarket.

Requirements gathering was done as a form of an interview which was face to face with the owner of the supermarket. There he briefs us about how the things will be working under the half manual systems. Furthermore, we had few phone conversations and email sharing to gather data.

Feasibility study

Under feasibility study we gather all the client requirements by considering following areas.

* Technical feasibility
* Operational feasibility
* Economic feasibility

Technical feasibility

In this supermarket most of the procedures are paper based and the owner is not familiar with new technologies or technical equipment. We planned on computerizing all the paper-based procedures considering the risk and security threats. By computerizing the system, we can increase the efficiency and reduce the risks that can occur within these procedures. For this we need to set up a new software in the pc of the supermarket.

Operational feasibility

Since the users are not more familiar with technological devices and technologies, we should be more considerate about the user friendliness of the system. Users should be able to operate the system easily, therefore, user interfaces should be simple.

While concerning about that fact we should maintain the efficiency and the security of the system at a higher level.

Economic feasibility

This supermarket is medium scale shopping mall where they have to handle 10-20 daily. Therefore, we need to come up with a solution that is suitable for that scope. So, we planned to have a medium scale budget where we have to cover expenses on the software.

Design

As for the design phase, drawing rough sketches of the user interface for each functionality is the first step and will be providing it to client for his approval. Once the client approves our diagram, we will be using a graphical user interface to draw our finalized interface. All the user interfaces will be alike as it will be user friendly for the system user.

Implementation

The implementation process will be started after completing the design phase. In the implementation phase each design planned will be coded and executed. After completing the implementation testing phase will be started.

Testing

As the system was developed individually as individual components first, we will be doing an unit testing to find out the individual defects. After completing the unit testing and error correction each part will be integrated with the other to complete the integrated testing. This is done to check whether each part works properly with one another. Thereafter system is tested as a whole under the system testing. So, that we can ensure the code is error free.

In case system will malfunction again the same process will happen until the testing is successful.

Maintenance

As in maintenance phase we will be abided to make any changes our client need. Moreover, if they request to add a new feature or delete any existing feature, that too will be done. Moreover, we will be fixing bugs and any type of error that would occur in the system.

## Project Plan

Table Project plan

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Task name | Duration  (Days) | Start | Finish | Predecessors |
| 01. | **Requirement gathering and Analysis:** |  |  |  |  |
|  | Client meeting | 04 |  |  |  |
|  | Analyzing gathered information | 03 |  |  |  |
|  | * **Project charter** |  |  |  | 03 |
|  | * **Project proposal** |  |  |  | 04 |
| 02. | **Design** |  |  |  | 07 |
|  | Specify software and  hardware specification | 02 |  |  |  |
|  | GUI design | 07 |  |  |  |
|  | Database design | 07 |  |  |  |
|  | * **SRS** |  |  |  | 06 |
| 03. | **Implementation** |  |  |  |  |
|  | Payment processing | 05 |  |  |  |
|  | Customer relationship management | 05 |  |  |  |
|  | Transaction management | 05 |  |  |  |
|  | Sales reporting | 06 |  |  |  |
|  | Inventory management | 07 |  |  |  |
|  | User management | 06 |  |  |  |
| 04. | **Testing** |  |  |  |  |
|  | Unit testing | 09 |  |  |  |
|  | Integration and integration testing | 04 |  |  |  |
|  | System testing | 06 |  |  |  |
|  | Prototype delivery |  |  |  | 21 |
|  | User acceptance test | 04 |  |  | 22 |
| 05. | **End product delivery** |  |  |  |  |

# Software and Hardware Requirements

Since the machine, bar code reader, card payment machines are stored previously, needed hardware components are

Hardware requirements

Screen for forefront transactions

Software requirements

Operating system: Windows 7 or above

Database connection: MySQL

Backend development: Java

# Budget

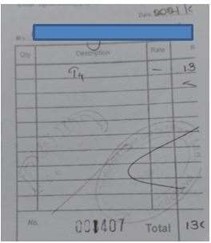
The following is a breakdown of the overall costs associated with the proposed POS system.

Table table of expenses

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Description | | Amount (Rs.) | Total(Rs.) |
| 1 | Software | NetBeans | 5000 |  |
| MySQL | 8000 |  |
| 13000 | | |
| 2 | Hardware | PC | 50,000 |  |
| Router | 3,500 |  |
| Printer | 27,500 |  |
| Storage device | 25,000 |  |
|  |  | 105,000 |
| 3 | Development | Labor | 10,000 |  |
| Internet facilities | 6,000 |  |
| 16,000 | | |
| 4 | Networking | Hosting cost | 500 |  |
| WIFI Package | 1,850 |  |
| 5 | Maintenance | | 25,000 |  |
| 27,300 | |
|  | Total | |  | 161,300 |

Table of expenses

# Appendix



Appendix A:Bill

***Mission S***

All Competitors

MYPOS – Nugegoda https://www.mypos.lk

TILLMAX – Piliyandala https://www.tillmax.lk/

ONEXLA – Piliyandala https://www.onexla.lk/

Merpacc POS – Kotte https://merpacc.com/

Retail IT (Pvt) Limited - Galle Road https://www.retailit.lk/

Kale - Havelock Road Colombo 05 https://www.kalesystems.com/

Ceymoss - http://www.ceymoss.com/products/pos/

Onimita - https://www.onimtait.com/

ABS POS - <http://www.abs.lk/pos/>

MYCOM LANKA –Colombo-04 : <https://mycom.lk>

Exesmart – Kurunegala : <https://exesmart.com>

ZILLIONe – Colombo 04 <https://zillione.com/zillione-ivend-retail-pos-sri-lanka/>

Ozone lanka – Colombo 11 <https://www.ozonelanka.com/>

Spicepos – Malabe <https://spicepos.com/>

Potential Competitors

MYPOS – Nugegoda https://www.mypos.lk

MYCOM LANKA –Colombo-04 : <https://mycom.lk>

Exesmart – Kurunegala : <https://exesmart.com>

ZILLIONe – Colombo 04 <https://zillione.com/zillione-ivend-retail-pos-sri-lanka/>

Ozone lanka – Colombo 11 <https://www.ozonelanka.com/>

Spicepos – Malabe <https://spicepos.com/>

***Mission T***

**Competitor Analysis for SLLIP**

According to the done research, the top competitors identified for SSIPL were,

* Prime Engineers – Galle Road , Colombo 03
* MYPOS – Nugegoda
* MYCOM
* Exesmart - Kurunegala
* Onimita
* TILLMAX

Key objectives, Capabilities, and company size

|  |  |  |
| --- | --- | --- |
| **Prime Engineers** | **Key objectives** | Help clients with the latest advances in technology. |
|  | **Capabilities** | Software solutions and web solutions |
|  | **Company size** | Medium scale |
| **MYPOS** | **Key objectives** | To be the preferred information technology solutions provider by setting standards in the retail sector |
|  | **Capabilities** | Software solutions |
|  | **Company size** | Large scale |
| **MYCOM Lanka** | **Key objectives** | Providing end-to-end solution, which gives the organization a single vendor who can integrate seamlessly across all required modules. |
|  | **Capabilities** | Retail Management  Restaurant Management  Cloud Point Of Sale  Smart ERP Solution  Catering Management System  Mobility Solution |
|  | **Company size** | Large scale |
| **Exesmart** | **Key objectives** | To be the leading organization to provide IT solutions. |
|  | **Capabilities** | Software Development  Web Hosting  Email Services  Database Management |
|  | **Company size** | Large scale |
| **Onimita** | **Key objectives** | To reach the pinnacle of IT industry in servicing with our finest performances and to offer innovative solutions for all scales of clients while heading towards being the best IT solution provider in the region. |
|  | **Capabilities** | System solutions  Hardware solutions |
|  | **Company size** | Large scale |
| **TILLMAX** | **Key objectives** | leading providers of Electronic Point of Sales (EPOS) systems and software to the Retail, Hospitality, and Fast Foods systems across the island |
|  | **Capabilities** | PROJECT MANAGEMENT  SOLUTION TAILORING  BESPOKE – THE INNOVATORS  CONSULTANCY  TENDER PROCESSING |
|  | **Company size** | Large scale |

​

Target market & market share

|  |  |  |
| --- | --- | --- |
| **Company Name** | **Services** | **Sectors** |
| **Prime Engineers** | Software solutions  Web solutions  IT Consultancy  Network Implementation | ERP Solution  Restaurant Management  Banking Solutions  Retail Management  Website design  E-Commerce  SEO  CMS  Social Media  Porfolio  Business Analysis  Technical Architect  Project Management  IS Audit  Installation & Cabling  Remote Access and VPN Solutions  Telecoms & VoIP Solutions  Network Data Storage Services  [1] |
| **MYPOS** | Software solutions | POS systems for:  Clothing shops  Supermarkets  Bookstores  Baker / Food & Beverage Retailers  Web / Ecommerce  Hotels / Restaurants & Cafés  Mother & Child Care / Kids & Toys  Liquor / Wine Stores  Game Centres  Jewelers  Laundry/Cleaning Services  Hardware Stores / Paint Shops  Electrical / Consumer Goods Stores  Spare Parts Retailers  Wholesalers / Imports / Distributors  Fitness Training  Queue Management Systems  [2] |
| **MYCOM Lanka** | Retail Management  Retail Point Of Sale  Cloud Point Of Sale  Smart ERP Solution  Catering Management System  Mobility Solution | Retail Point Of Sale  Retail Back Office  Retail E-Commerce  Retail Stock Count App  Quick POS  Restaurant Point Of Sale  Electronic Menu  Online Order System  Call Center for Restaurant  Restaurant Back Office  Online Reporting System  [3] |
| **Exesmart** | Software Development  Web Hosting  Email Services  Database Management | emPower Payroll & HR  World POS  World Finance  World ERP  SafeTrax  E-Commerce Solutions  Search Engine Optimization  Social Media Marketing  Multi-site database configuration  High-End data replication  SQL Reporting services  Schema design for small to large systems  Database Normalization  Dataware housing  Data Manipulating  [4] |
| **Onimita** | Software solutions  Hardware Solutions | ERP Systems  Hotel and Restaurant Management  POS Systems  Hospital Management Systems  CRM Software Solution  HRM and Payroll Systems  Accounting Software  Factory Management Software  Distribution Management System  Construction Management Software  Mobile Applications  Bar-code Solutions  POS Machine  Android POS  Servers  Fingerprint Scanners  Cash Drawer  Bar-code Readers  Printer [5] |
| **TILLMAX** | PROJECT MANAGEMENT  TENDER PROCESSING  SOLUTION TAILORING  BESPOKE – THE INNOVATORS  CONSULTANCY | Project Assessment and Profiling  Site Reviews and Surveys  Quality Standards  Workflow Management Documentation  Project Strategy  Pre-qualifications of tenderers  Invitation to tenders and obtaining tenders  Opening of tenders  Evaluation of tenders  Award of contract  Supervision  Measurements  Variations and valuation  Payments, extensions & claims  Dispute resolution & termination  Completion [6] |

Marketing strategies

|  |  |  |  |
| --- | --- | --- | --- |
| **Company / Business** | **Strategies** | **Availability** | **Notes and Links** |
| **Prime Engineers** | **Website** | ✓ | http://www.prime.lk |
|  | **Blog/Content** | ✓ | http://www.prime.lk |
|  | **Online advertising** | ✕ |  |
|  | **Offline advertising** | ✕ |  |
|  | **Videos and webinars** | ✕ |  |
|  | **Major events** | ✕ |  |
|  | **Customer resources** | ✕ |  |
|  | **Customer review listings** | ✕ |  |
|  | **Customer engagement** | ✕ |  |
|  | **Social proof (customer logos)** | ✕ |  |
|  |  |  |  |
| **MYPOS** | **Website** | ✓ | https://www.mypos.lk |
|  | **Blog/Content** | ✓ | https://www.mypos.lk/blog |
|  | **Online advertising** | ✓ | https://www.facebook.com/myPOSonline |
|  | **Offline advertising** | ✕ |  |
|  | **Videos and webinars** | ✓ | https://www.youtube.com/c/myposvideo |
|  | **Major events** | ✕ |  |
|  | **Customer resources** | ✓ | https://www.mypos.lk/clients |
|  | **Customer review listings** | ✓ | https://www.mypos.lk/testimonials |
|  | **Customer engagement** | ✓ | https://www.mypos.lk/testimonials |
|  | **Social proof (customer logos)** | ✓ | https://www.mypos.lk/client-logos |
| **MYCOM Lanka** | **Website** | ✓ | http://mycom.lk/ |
|  | **Blog/Content** | ✕ |  |
|  | **Online advertising** | ✓ | https://www.facebook.com/MycomLankaLtd |
|  | **Offline advertising** | ✕ |  |
|  | **Videos and webinars** | ✓ | https://www.youtube.com/user/mycomsystems |
|  | **Major events** | ✕ |  |
|  | **Customer resources** | ✓ | http://mycom.lk/profile.html |
|  | **Customer review listings** | ✕ |  |
|  | **Customer engagement** | ✕ |  |
|  | **Social proof (customer logos)** | ✕ |  |
| **Exesmart** | **Website** | ✓ | https://exesmart.com |
|  | **Blog/Content** | ✕ |  |
|  | **Online advertising** | ✓ | https://www.facebook.com/exesmart |
|  | **Offline advertising** | ✕ |  |
|  | **Videos and webinars** | ✕ |  |
|  | **Major events** | ✕ |  |
|  | **Customer resources** | ✓ | https://exesmart.com/Clients-Business-Automation-Consultation-Sri-Lanka |
|  | **Customer review listings** | ✓ | https://exesmart.com/Clients-Business-Automation-Consultation-Sri-Lanka |
|  | **Customer engagement** | ✓ | https://exesmart.com/Clients-Business-Automation-Consultation-Sri-Lanka |
|  | **Social proof (customer logos)** | ✓ | https://exesmart.com/Clients-Business-Automation-Consultation-Sri-Lanka |
| **Onimita** | **Website** | ✓ | https://www.onimtait.com/ |
|  | **Blog/Content** | ✓ | https://www.onimtait.com/blog |
|  | **Online advertising** | ✓ | https://www.facebook.com/onimta/ |
|  | **Offline advertising** | ✕ |  |
|  | **Videos and webinars** | ✕ |  |
|  | **Major events** | ✕ |  |
|  | **Customer resources** | ✓ | https://www.onimtait.com/our-clients |
|  | **Customer review listings** | ✕ |  |
|  | **Customer engagement** | ✕ |  |
|  | **Social proof (customer logos)** | ✓ | https://www.onimtait.com/our-clients |
| **TILLMAX** | **Website** | ✓ | https://www.tillmax.lk |
|  | **Blog/Content** | ✕ |  |
|  | **Online advertising** | ✕ |  |
|  | **Offline advertising** | ✕ |  |
|  | **Videos and webinars** | ✕ |  |
|  | **Major events** | ✕ |  |
|  | **Customer resources** | ✓ | https://www.tillmax.lk/AboutUs.php?page=AboutUs |
|  | **Customer review listings** | ✓ | https://www.tillmax.lk/AboutUs.php?page=CaseStudies |
|  | **Customer engagement** | ✓ | https://www.tillmax.lk/AboutUs.php?page=CaseStudies |
|  | **Social proof (customer logos)** | ✓ | https://www.tillmax.lk/AboutUs.php?page=AboutUs |

SWOT analysis

**Prime Engineers**

|  |  |
| --- | --- |
| **Strengths** | **Opportunities** |
| * Using technologies like 2EE:JSP/Servlets, JNDI, RMI, EJB, JMS, JTA, JDO, JNI, JMX, JAAS, JSSE, JCE, Java TimerService, Applets, Swing, Java Web Start, JSF, Struts, GWT, Ext-GWT, GWT-Ext, Seam, Tapestry, Velocity, Spring, Hibernate, Toplink, Quartz, Jasper Reports, Lucene, Solr, OpenAM, Axis, ActiveMQ, ESB, Terracotta, GigaSpaces .NET: ASP.NET, ASP.NET MVC, ASP.NET AJAX, Telerik, Windows Forms, WPF, Silverlight, ADO.NET, Linq, NHibernate, Lucene.NET, .NET Remoting, Windows Media Services, WM DRM, PlayReady DRM,Sitecore, Sharepoint, | * The ability to work with high technologies with continuous updates |
| **Weaknesses** | **Threats** |
| * Not informing their clients about their previous clients and their comments | * Lack of marketing strategies |

**MYPOS**

|  |  |
| --- | --- |
| **Strengths** | **Opportunities** |
| * Cloud based POS systems which can be accessed from anywhere | * Availability of cloud computing and the ability to get a knowledge about it |
| **Weaknesses** | **Threats** |
| * Not using offline methods for conducting marketing | * Being vulnerable to unauthorized logins due to the using of cloud computing |

**MYCOM Lanka**

|  |  |
| --- | --- |
| **Strengths** | **Opportunities** |
| * Providing end to end solutions | * Being a successful company with more than 20 years of experience |
| **Weaknesses** | **Threats** |
| * Unavailability of previous client records and comments | * Lack of focus on the website |

**Exesmart**

|  |  |
| --- | --- |
| **Strengths** | **Opportunities** |
| * Providing services like Software Development   Web Hosting  Email Services  Database Management | * Ability to work in a company with more than 100 island famous clients |
| **Weaknesses** | **Threats** |
| * Not uploading video sessions or webinars about their company and it’s progress | * Lack of marketing strategies which bring them clients |

**Onimita**

|  |  |
| --- | --- |
| **Strengths** | **Opportunities** |
| * High quality software products | * Work with a island wide accepted company with more than 500+ popular clients |
| **Weaknesses** | **Threats** |
| * Not publishing customer reviews and comments | * Keeping their product reviews unpublished |

**TILLMAX**

|  |  |
| --- | --- |
| **Strengths** | **Opportunities** |
| * Being an international company with more than 16 years of experience | * Ability to work in an in an international company |
| **Weaknesses** | **Threats** |
| * Not using video files in order to make their business famous | * Avoiding using social media to publish their business |

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