**MINISTRY OF EDUCATION**

**AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

Distribution Management System in pharmaceutical

|  |  |
| --- | --- |
| Distribution Management System in pharmaceutical | |
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Contents

[1.1. Introduction 4](#_Toc437193001)

[1.1.1. Purpose 4](#_Toc437193002)

[1.1.2. Acronyms and definitions 5](#_Toc437193003)

[1.2. Abstract 5](#_Toc437193004)

[1.3. Literature review 5](#_Toc437193005)

[1.4. Proposal 6](#_Toc437193006)

[1.4.1. Initial idea of the DMS 6](#_Toc437193007)

[1.4.2. Objectives 6](#_Toc437193008)

[1.4.3. System features 6](#_Toc437193009)

[1.5. Benefit from project 7](#_Toc437193010)

[1.5.1. For our group 7](#_Toc437193011)

[1.5.2. For Distrisbutor and Drugstore 7](#_Toc437193012)

[1.6. Critical assumption and constraints 8](#_Toc437193013)

[1.7. Potential risks 8](#_Toc437193014)

[2.1. Problem Definition 8](#_Toc437193016)

[2.1.1. Name of this Capstone Project 8](#_Toc437193017)

[2.1.2. Problem Abstract 8](#_Toc437193018)

[2.1.3. Project Overview 8](#_Toc437193019)

[2.2. Project Organization 9](#_Toc437193020)

[2.2.1. System Process Model 9](#_Toc437193021)

[2.2.2. Roles Responsibilities 9](#_Toc437193022)

[2.2.3. Tools and Techniques 9](#_Toc437193023)

[2.3. Schedule 9](#_Toc437193024)

[2.4. Convention Rules 9](#_Toc437193025)

[3.1. User Requirement Specification 9](#_Toc437193027)

[3.1.1. Functional Requirements 9](#_Toc437193028)

[3.2. System Requirement Specification 9](#_Toc437193029)

[3.2.1. External Interfaces 10](#_Toc437193030)

[3.2.2. Functional Requirement 10](#_Toc437193031)

[3.2.3. Non-functional Requirements 14](#_Toc437193032)

[3.3. Entity Relationship Diagram 14](#_Toc437193033)

[4.1. Architectured Design 14](#_Toc437193035)

[4.1.1. Choice of Architecture Design 14](#_Toc437193036)

[4.1.2. Component Design 14](#_Toc437193037)

[4.2. Detail Description of Components 14](#_Toc437193038)

[4.2.1. Entities Classes 14](#_Toc437193039)

[4.2.2. Generic Repository Class 15](#_Toc437193040)

[4.2.3. Sequence Diagram 15](#_Toc437193041)

[4.3. Database Design 15](#_Toc437193042)

[4.3.1. Physical Database Design 15](#_Toc437193043)

[4.4. Algorithms 16](#_Toc437193044)

[4.4.1. Nearest Neighbor Algorithms 16](#_Toc437193045)

[5.1. Introduction 16](#_Toc437193047)

[5.1.1. System Overview 16](#_Toc437193048)

[5.1.2. Test Approach 16](#_Toc437193049)

[5.2. Test Plan 16](#_Toc437193050)

[5.2.1. Scope of testing 16](#_Toc437193051)

[5.2.2. Requirement for testing 16](#_Toc437193052)

[5.2.3. Test Strategy 17](#_Toc437193053)

[5.3. Test Cases 17](#_Toc437193054)

[5.3.1. Account Control 17](#_Toc437193055)

[5.3.2. Manage Order 17](#_Toc437193056)

[5.3.3. Mange Drug Store 18](#_Toc437193057)

[5.3.4. Manage Drug 18](#_Toc437193058)

[5.3.5. Manage Category 18](#_Toc437193059)

[5.3.6. Manage Schedule 18](#_Toc437193060)

[5.3.7. Manage Salesman 18](#_Toc437193061)

[5.3.8. Manage Account 18](#_Toc437193062)

[5.4. Checklists 18](#_Toc437193063)

[5.4.1. Checklist of Validation 18](#_Toc437193064)

[5.4.2. Checklist of User Interface 19](#_Toc437193065)

[5.4.3. Checklist for Document 19](#_Toc437193066)

[5.5. Test logs 19](#_Toc437193067)

[5.5.1. Defect Logs 19](#_Toc437193068)

[5.5.2. Test Report 19](#_Toc437193069)

## Introduction

### Purpose

This part is the introduction for Distribution Management System in phamarceutical (DMS) Project – our Capstone Project in FPT University. It is included the overview of existing system, the initial idea of this project.

The propose system will eliminate all the existing system limitations with its new features:

* Drugstores can easily make orders on website with registed account or view drug brand information. That helps Drugstore no longer solely depended on salesmen.
* Staffs manage Drugstore, Drugstore’s order, Salesman, Deliverymen and drug brands. All management functions are in one system.
* Salesmans are able to create order for drugstore in their areas.
* Manager can view all report about Salesmans.
* Administrator manage all user belong to system.
* System create shortest path between Drugstore for Deliveryman.

The new system will help the supplier save money, protect ustomer and reduce unnessary work for Staff.

### Acronyms and definitions

|  |  |  |
| --- | --- | --- |
| **Acronym & Abbreviation** | **Definition** | **Note** |
| DMS | Distribution Management System in phamarceutical |  |

**Table 1-1 :Acronyms and definitions**

## Abstract

The existing pharmaceutical supplier website only provides drug brands information. If drugstore want to order, they have to contact with Distributor….

The managements of Drugstore’s orders, Salesmen and Deliverymen are done separately, so the effort for an order to reach the drugstore is multiple. Since, Salesmen have to inform the Staff, and Staff will use the program to create an order then prepare that order’s products. After the preparation is finished, the staff will have to calculate by themselves which orders go together for a more efficient route. This calculation can be incorrect and sometimes the Staff just skips it when it seems too difficult which causes the supplier to lose money.

## Literature review

Indico International Distribution (<http://www.indico.vn>) .

* + - **Advantages:**
      * User interface clearly and easy to use.
      * Quick response for user’s action.
      * There are more Drug’s information.
      * There are more different kind of Drugs.
      * Feedback function.
* **Disadvantages:**
  + - * There are no price with each product.
      * System does not support register new account.
      * Cannot search Drug with Textbox.
      * Paging limit minimum 75 elements, hard to view and scroll.

## Proposal

### Initial idea of the DMS

The initial idea is to make the management of a pharmaceutical supplier’s distribution system more efficient and easy. By providing an online system that has these features:

* Drugstores can easily make orders on website with a registered account or view drug brand information.
* Staffs can manage drugstores, drugstore’s orders, salesmen, deliverymen and drug brands.
* Salesmen are able to create orders for drugstores in their areas.
* The system can automatically arrange drugstore’s orders for deliverymen to create the shortest path between drugstores and it can also automatically create and assign drugstore group for salesmen based on their addresses.
* The administrator can manage staffs, salesmen, deliverymen, drugstore’s accounts.
* The system also manages drugstore payments and debts.

### Objectives

This project is the Capstone Project for all team members. Firstly, we do this project to fulfill the requirements from FPT University studying program. During the time do this, we can learn how to develop a project, how to communicate with other team members, how to control time, how to do teamwork effectively. Therefore, after finishing this project, we can practice what we have learnt in University and learn so many new things. It’s very necessary for our future work after graduating from FPT University.

Secondly, we want to create a website for Distributor that help Drug store and Distributor can work more effective, faster, easier and simpler.

### System features

The expected system will eliminate all the existing system limitations with its new features:

**Manage components below:**

* *Drugstores* can easily make orders on website with a registered account or view drug brand information. This helps the drugstores no longer solely depended on salesmen.
* *Staff* can manage Drugstore, Drugstore’s order, salesman, deliveryman and drug brand. All managements are done on one system.
* *Administrator* can manage staffs, salesman, deliveryman, drugstore’s accounts.
* *Manager* can view all report from salesman.
* *System* can automatically create the shortest path between drugstores. System can manages drugstore payments and debts.
* *Salesman* are able to create orders for drugstores in their area. Reduce work for staff.

## Benefit from project

If this application will be developed and implemented successfully, our group and Distributor will get some benefits from it.

### For our group

After developing and implementing this project, our group will get some benefits:

* We have more experiences of managing a software project: how to manage plan, time, and risk. These experiences help us a lot in our future work.
* Know how to communicate with other team members and how to do teamwork efficiently
* If this application is developed, we will get a good mark in Capstone Project. It makes our grade better.

### For Distrisbutor and Drugstore

After developing and sending to Distributor, Staff and Drugstore will work in only one website.

* Drugstore users can order Drug easier, faster. They can find out more drug information. They can view all history about order and payment.
* Staff can work efficient and easy to manage drug, salesman, deliveryman
* Deliveryman can get shortest path that help save money, time and effort.
* Manager easier with auto statistical and report in every year.
* Salesman can view order history order and payment of each Drugstore and have new strategy for them.

## Critical assumption and constraints

There are some critical assumptions that we realize after analyzing this project. The first assumption is about team members. We assume that all the team members can work with MVC and C#. We do not know anything about it before this project, but we have to study hard for not missing any deadline of project plan. Besides, we also assume all our members do not have any health problems, so they are not absent and can do their works.

There are also some constraints of our project. Firstly, about the time and deadline, we have to finish project on time. It has no extra time for us to complete developing and deliver application to teachers. Besides, the reports need to be submitted before the deadline. Secondly, about the quality, the application must be well enough for users to do main function. Finally, about the technique, our knowledge in C# and MVC is not in the high level. Therefore, with all the expected features that we gave before, we do not know if we can solve all of those or not. However, we will try our best to make our project successfully.

## Potential risks

After analyzing this project, we may be facing some risks:

* + - With the short duration - about 3 months – we will not have enough time to do all things and miss the delivery deadline.
    - We do not have any experiences in software project management such as time management, risk management etc. So maybe we will miss the deadline or have some unknown risks.
    - It is the first time we manage big project like this, we do not have much experiences in communicating between the team. So maybe in the future, we will have conflict and argument and we will not finish all the works in time.
    - Maybe we will lose source code or device during the developed time.



## Problem Definition

### Name of this Capstone Project

English: Distribution Management System in pharmaceutical

Vietnamese: Hệ thống quản lý phân phối ngành dược phẩm

Abbreviation: DMS

### Problem Abstract

The existing pharmaceutical supplier website only provides drug brands information. If drugstores want to order, they have to do it through a salesman. But the salesman are not always consistant to the supplier, they can change product prices or switch to another supplier which causes the supplier to loose customer.

The manager of drugstore’s orders, salesman and deliverymans are done separately, so the effort for an order to reach the drugstore is mutilpled. Since the salesman have to inform the staff, and the staff will use the program to create an order then prepare that order’s products. After the preparation is finished, the staff will have to calculate by themselves which orders go together for a more efficient route. This calculation can be incorrect and sometimes the staff just skips it when it seems too difficult which causes the supplier to loose money.

### Project Overview

#### The Current System

The existing pharmaceutical supplier website only provides Drug brand information

The management of drugstore’s orders is done by using a program which has no function other than managing Drug brand, Drugstore and orders

* Advantages:
  + User interface clearly and easy to use.
  + Quick response for user’s action.
  + There are more Drug’s information.
  + There are more different kind of Drugs.
  + Feedback function.
* Disadvantages:
  + There are no price with each product.
  + System does not support register new account.
  + Cannot search Drug with Textbox.
  + Paging limit minimum 75 elements, hard to view and scroll.

#### The Proposed System

The new system will have belows components:

* Salesman: Manage Drugstore, View Order, Create Order, Edit Discout, View history
* Staff: Manage Salesman, assign Drugstore to Salesman, Confirm Order, View Order, View history.
* Manager: View all report, View history.
* Administrator: Manage all account.
* Drug Store: Create Order, View history.

Advantages over the old system:

* More stable.
* Easy upgrade, manage and maintance
* Manage multiple data.

Can be used for many types of Distributor.

#### Boundaries of the System

* The system is designed for all Pharmaceutical Distributor.
* The language of the system support Vietnamese.
* The system does not include Warehouse management.

#### Development Environment

#### Hardware Requirement

**For Server**

|  |  |  |
| --- | --- | --- |
| Windows | Minimum Requirements | Recommended |
| Internet Connection | Cable, Wi-Fi (4 Mbps) | Cable, Wi-Fi (8 Mbps) |
| Operating System | Window Server 2008 | Window Server 2008 |
| Computer Processor | Intel® Xeon ® 1.4GHz | Intel® Xeon ® Quad Core  (12M Cache, 2.50 GHz) |
| Computer Memory | 1GB RAM | 2GB or more |

**Table 2-1: Hardware Requirement**

#### Software Requirement

* Handle Products and sprints backlog: MS Excel 2013.
* Implement Website and service: Visual Studio 2013.
* Create and manage database for system: SQL Server 2008.
* Source control: Github.
* Create models and diagrams: Software Ideas Modeler.
* Communicate and meeting: Skype 7.0 and Google mail.
* System and platform development: Window 7.

## Project Organization

### System Process Model

Beacause of the project characteristics, we decide to make progress in series of sprints which are time boxed interations in one week. At the beginning of one sprint, through sprint planning meeting, all team members will discuss together to define sprint backlog which suitable to be completed within a week. Daily meeting and online conference are used to manage all activies and issues troubleshot. At the end of sprint, product onwer and developer team will review completed product to figuring out the necessary changes for product.

**Figure 2-1: Scrum Process Model**

### Roles Responsibilities

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Role | Responsibilities |
| 1 | Nguyễn Văn Sang | Supervisor | Support business and solution  Tracking and review project |
| 2 | Trương Võ Thiên Vũ | Project Manager  SRS Analysis  Developer Leader  QA Leader | - PM has responsibilities to develop the project plan and manage project stakeholders, project team, project risk, project schedule, project budget, project conflicts.  - Analyze business.  - Ensure that the Project Team completes the project.  - Provide suitable technology solutions, tools for project development process.  - Create coding guidelines, coding convention and standards.  - Cooperate with Developer to create software specification requirement (SRS), architectural design (SAD) and software detailed design (SDD).  - Review document, product, and reports.  - Support other team members. |
| 3 | Tạ Đức Tùng | Member  SRS Analysis Leader  Developer  Tester | - Analyze business. Understand business related to project topic.  - Present and explain business information to other members.  - Create and review SRS, SAD and SDD documents.  - Writing report.  - Create test data for all functions.  - Design User Interface  - Create test cases for the system.  - Execute test to ensure all functions fulfill requirements and make test report. |
| 4 | Nguyễn Trọng Việt | Member  Developer  SRS Analysis  Tester | - Develop a plan to draw and control architectural design.  - Coding function  - Execute test to ensure all functions fulfill requirements and make test report.  - Create test cases for the system, both in document and script.  - Support other team members. |

**Table 2-2: Role and Responsibilities**

### Tools and Techniques

#### Tools

* Microsoft Visual Studio 2013: Integrated Development Environment (IDE)
* Microsoft SQL Server 2008: Database Management System (DBMS)
* Microsoft Office: Create documents and reports
* Software Ideas Modeler: Draw diagrams
* GitHub: Subversion repository for controlling source code
* Firefox, Chrome: Environment to use and testing project.

#### Techniques

* Front-end technologies:
  + CSS3, Javascript, jQuery, AJAX, Google IPI, Bootstrap
* Back-end technologies:
  + Website: MVC5.NET
  + Framework: Entities Frame Work 6
* Webserver: localhost

## Schedule

## Convention Rules



## User Requirement Specification

### Functional Requirements

#### Guest Requirement

#### Authorized User Requirement

#### Drugstore Requirement

#### Staff Requirement

#### Salesman Requirement

#### Administrator Requirement

## System Requirement Specification

### External Interfaces

#### User Interfaces

#### Software Interface

### Functional Requirement

#### Function List

##### List of User

#### Overview Use-Case Diagram

#### Use-Case list

#### UC0001 <Guest> Register

##### Use-Case Diagram

##### Use-Case Specification

#### UC0002 <Guest> Login

##### Use-Case Diagram

##### Use-Case Specification

#### UC0003 <Guest> Forgot Password

##### Use-Case Diagram

##### Use-Case Specification

#### UC0004 <Guest> Search Drug

##### Use-Case Diagram

##### Use-Case Specification

#### UC0005 <Guest> View Drug Detail

##### Use-Case Diagram

##### Use-Case Specification

#### UC0006 <Guest> View All Drug

##### Use-Case Diagram

##### Use-Case Specification

#### UC0007 <Authorized User> Search Drug

##### Use-Case Diagram

##### Use-Case Specification

#### UC0008 <Authorized User> View All Drug

##### Use-Case Diagram

##### Use-Case Specification

#### UC0009 <Authorized User> Update Profile

##### Use-Case Diagram

##### Use-Case Specification

#### UC0010 <Authorized User> Change Password

##### Use-Case Diagram

##### Use-Case Specification

#### UC0011 <Authorized User> Logout

##### Use-Case Diagram

##### Use-Case Specification

#### UC0012 <Drugstore> Create Order

##### Use-Case Diagram

##### Use-Case Specification

#### UC0013 <Drugstore> View Order history

##### Use-Case Diagram

##### Use-Case Specification

#### UC0014 <Drugstore> View Payment history

##### Use-Case Diagram

##### Use-Case Specification

#### UC0015 <Drugstore> Cancel Order

##### Use-Case Diagram

##### Use-Case Specification

#### UC0016 <Salesman> Verify Drugstore

##### Use-Case Diagram

##### Use-Case Specification

#### UC0017 <Salesman> Create Order

##### Use-Case Diagram

##### Use-Case Specification

#### UC0018 <Salesman> View Order

##### Use-Case Diagram

##### Use-Case Specification

#### UC0019 <Salesman> View Order Detail

##### Use-Case Diagram

##### Use-Case Specification

#### UC0020 <Salesman> Set Discount Rate

##### Use-Case Diagram

##### Use-Case Specification

#### UC0021 <Staff> Approve Order

##### Use-Case Diagram

##### Use-Case Specification

#### UC0022 <Staff> Add Drug

##### Use-Case Diagram

##### Use-Case Specification

#### UC0023 <Staff> Delete Drug

##### Use-Case Diagram

##### Use-Case Specification

#### UC0024 <Staff> Edit Drug

##### Use-Case Diagram

##### Use-Case Specification

#### UC0025 <Staff> Assign Salesman

##### Use-Case Diagram

##### Use-Case Specification

#### UC0026 <Staff> Create Category

##### Use-Case Diagram

##### Use-Case Specification

#### UC0027 <Staff> Delete Category

##### Use-Case Diagram

##### Use-Case Specification

#### UC0028 <Staff> Edit Category

##### Use-Case Diagram

##### Use-Case Specification

#### UC0029 <Staff> Create Delivery Schedule

##### Use-Case Diagram

##### Use-Case Specification

#### UC0030 <Staff> Update Schedule Status

##### Use-Case Diagram

##### Use-Case Specification

#### UC0031 <Administrator> Create Account

##### Use-Case Diagram

##### Use-Case Specification

#### UC0032 <Administrator> Deactivate Account

##### Use-Case Diagram

##### Use-Case Specification

#### UC0033 <Administrator> Register

##### Use-Case Diagram

##### Use-Case Specification

### Non-functional Requirements

#### Reliability

#### Security

#### Maintainability

## Entity Relationship Diagram



## Architectured Design

### Choice of Architecture Design

#### MVC Model Overview

#### Advantages and Disadvantages of Layer Model

### Component Design

## Detail Description of Components

### Entities Classes

### Generic Repository Class

### Sequence Diagram

#### <Guest> Register

#### <Guest> Login

#### <User> Create Order

#### <User> View Order history

#### <Staff> Approve Order

#### <Staff> Assign Salesman

#### <Staff> Create Delivery Schedule

#### <Staff> Delete Delivery Schedule

#### <Staff> Add Drug

#### <Staff> Edit Drug

#### <Staff> Delete Drug

#### <Staff> Create Category

#### <Staff> Edit Category

#### <Staff> Delete Category

## Database Design

### Physical Database Design

#### Account

#### AccountProfile

#### DeliveryMan

#### DeliverySchedule

#### DeliveryScheduleDetails

#### DiscountRate

#### DrugOrder

#### DrugOrderDetail

#### Drugstore

#### Drugstore Type

#### Drugtype

#### Payment

#### UnitPrice

#### Role

#### Unit

#### City

#### District

## Algorithms

### Nearest Neighbor Algorithms



## Introduction

### System Overview

### Test Approach

## Test Plan

### Scope of testing

### Requirement for testing

#### Test items

#### Acceptance Test Criteria

#### Constraints

#### Risk list

### Test Strategy

#### Test policy

#### Test Model

#### Type of Testing

##### Functional Testing

##### User Interface Testing

#### Test stage

#### Tools

#### Resources

#### Schedule

## Test Cases

### Account Control

#### Register

#### Login

#### Logout

#### Forgot Password

#### Change Password

### Manage Order

#### Create Order

#### Cancel Order

#### Create Schedule

#### View Order Detail

#### View All Order

#### Approve Order

#### View Order history

### Mange Drug Store

#### Mange Drugstore

#### Verify kind of Drugstore

### Manage Drug

#### Add Drug

#### Delete Drug

#### Edit Drug

### Manage Category

#### Create Category

#### Edit Category

#### Delete Category

### Manage Schedule

#### Create Schedule

#### Update Schedule

### Manage Salesman

#### Assign Salesman to Group

### Manage Account

#### Create Account

#### Deactivate Account

#### Activate Account

## Checklists

### Checklist of Validation

### Checklist of User Interface

### Checklist for Document

## Test logs

### Defect Logs

### Test Report