<*Project Name*>

Functional Specifications

This is the document that completely defines the specifications of a proposed system. This is the basic document, which will be used as the basis for implementation.

The paragraphs written in the “Comment” style are for the benefit of the person writing the document and should be removed before the document is finalized.

In order to gain technical and methodological background refer to the following books:

* Applying Use Cases by Geri Schneider, Jason P.Winters
* Applying UML and Patterns: An Introduction to Object Oriented Analysis and Design by Craig Larman
* Object Oriented Analysis and Design with Applications by Grady Booch

Version: <*Fill version here*>

<*Date*>

**Prepared by: *Author(s)***

Revision Chart

This chart contains a history of this document’s revisions. The entries below are provided solely for illustration purposes. Those entries should be deleted until the revision/s they refer to have actually been created.

The document itself should be stored in revision control, and a brief description of each version should be entered in the Revision Control System. A brief description can be repeated in this section. Revisions need not be described elsewhere in the document, unless they explain the document.

| Version | Primary Author(s) | Description of Version | Date Completed |
| --- | --- | --- | --- |
| *Draft* | Veijo Väisänen | Initial draft created for distribution and review comments | 21.1.2016 |
| *Preliminary* | Veijo Väisänen | Second draft incorporating initial review comments, distributed for final review | 12.2.2016 |
| *Final* | Veijo Väisänen | First complete draft, which is placed under change control | 1.3.2016 |

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# Introduction

This section should describe the project and the software product being to be built. No text is necessary between the heading above and the heading below unless otherwise desired.

## Project Overview

Give a short summary of the project objective and the system to be analyzed

Functional specifications are a description of needs or desires for a product. Identify and document what is really needed, in a form that clearly communicates to the client and to development team members. Define the requirements unambiguously, so that the risks are identified and there are no surprises when the product is finally delivered.

Following are the sample artifacts for this section:

* Problems or Overview Statement
* Customer
* Goals

## Problem Statement

The purpose of this project is to …

The problem statement should be brief, comprising of no more than 50 words

## Reference/ Source Documents

Provide references to all documents that have been consulted during the analysis phase.

## Goals

This brief section should focus on what the client wants to achieve. It must enumerate the objectives of the top management and what it hopes to accomplish from the proposed system.

# System Architecture

Describe the system architecture, or simply provide the architecture diagram. For School system it may include web based front end, webserver , database etc. Don’t worry too much about it just give a simple diagram of a typical web based project.

## System Architecture Diagram

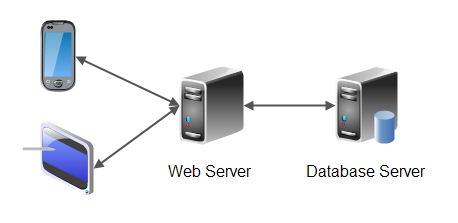


Figure 1 System Architecture

# Use Case Model

Describe the following items:

* Actors & use cases
* Use case diagram
* High level, essential use cases

No text is necessary between the heading above and the heading below unless otherwise desired.

## List of Actors

Admin; this person performs all the system activities

Visitor; this person can see the products and make a user account

Registered user; this person can select product(s) and pay for it send feedbacks.

## List of Use Cases

List all the use cases, with a brief description (should not exceed two lines):

Log In; allow user to provide account information and start purchasing.

View Items; allow visitor and customer to see products and their specifications.

Add Items to cart; allow customer to add (or remove) one or more products to shopping cart.

Instant pay; allow customer select payment method and accept payment.

Feedback; allow customer to rate products and send feedback to admin.

Registering user; allow visitor to be a customer by making an account in the system.

Track orders; allows admin to tack all orders and customer to track his(her) orders.

Add Item; allow admin to add a new item to system or edit the specifications of the products.

Reporting; allow admin to make a sale report with the graph.

## Use Case Diagram

Create the system level use case diagram



Figure 2 System Level Use Case Diagram

## Use cases

**Use Case Login**

*Name: Login*

*Actors: Customers.*

*Purpose: Login to system by the email and password.*

*Description: A customer provides his email and password to login.*

*Cross Reference*: *Customer must register himself first then he can login to system.*

Pre-Conditions: --

Successful Post-Conditions: *System ready to use.*

Failure Post-Conditions: *Customer must recover his password*

|  |  |  |  |
| --- | --- | --- | --- |
| **Typical Course of Events** | | | |
| **Actor Action** | | **System Response** | |
| 1 | This state begins when user clicked at login page or started adding item to cart without login |  |  |
| 2 | Customer provides email address and password | 3 | System compares the entered data with saved data in data base |
| 4 | Customer start using systems. |  |  |
|  |  |  |  |
|  |  |  |  |

**Use Case ViewItems**

*Name: View Items.*

*Actors: Customers, visitors, Admin.*

*Purpose: Finding the toys by searching and flirting the list of products.*

*Description: A customer can see the list of products and can add them to the cart.*

*Cross Reference*: *Customer must login first.*

Pre-Conditions: --

Successful Post-Conditions: *Customer find the best one and add it to the cart.*

Failure Post-Conditions:

|  |  |  |  |
| --- | --- | --- | --- |
| **Typical Course of Events** | | | |
| **Actor Action** | | **System Response** | |
| 1 | This action begins by showing some products after logging in to system |  |  |
| 2 | Customer select a product by searching and filtering the products | 3 | System represent a new products list after user specified the search criteria. |
| 4 | Customer continue shopping. |  |  |
|  |  |  |  |
|  |  |  |  |

**Use Case Add items to cart**

*Name: Add items to cart.*

*Actors: Customers, Admin.*

*Purpose: adding desired item to the shopping cart.*

*Description: A customer can add one or more products to the cart.*

*Cross Reference*: *Customer must login first.*

Pre-Conditions: --

Successful Post-Conditions: *Customer is ready to checkout.*

Failure Post-Conditions:

|  |  |  |  |
| --- | --- | --- | --- |
| **Typical Course of Events** | | | |
| **Actor Action** | | **System Response** | |
| 1 | This action begins when user press adds to cart | 2 | System shows the item description and a place to write the number of product |
| 3 | Customer define the quantity | 4 | System check the entered quantity by the stock inventory. |
| 5 | Customer is ready for instant pay. |  |  |
|  |  |  |  |
|  |  |  |  |

**Use Case Instant pay**

*Name: Instant Pay.*

*Actors: Customers.*

*Purpose: paying for the selected items.*

*Description: A customer can select payment method (PayPal, credit card) then he can confirm the payment.*

*Cross Reference*: *Customer must add item to the shopping cart first.*

Pre-Conditions: --

Successful Post-Conditions: *Customer is able to take the order.*

Failure Post-Conditions: *Customer is not able to pay for some reason.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Typical Course of Events** | | | |
| **Actor Action** | | **System Response** | |
| 1 | This action begins when the customer clicked at the pay it now button. | 2 | System represents the list of payment method |
| 3 | Customer choose on of the payment method and click confirm | 4 | System send a request to the payment source and show the result to the customer. |
| 5 | Customer can continue shopping. |  |  |
|  |  |  |  |
|  |  |  |  |

**Use Case Feed Back**

*Name: Feedback.*

*Actors: Customers, Admin.*

*Purpose: Rating the products and give some feedback to admin.*

*Description: A customer can rate the products by stars and also he is able to write somethings to admin and Admin is able to answer.*

*Cross Reference*: *Customer must login first.*

Pre-Conditions: --

Successful Post-Conditions: *Customer save his opinion.*

Failure Post-Conditions:

|  |  |  |  |
| --- | --- | --- | --- |
| **Typical Course of Events** | | | |
| **Actor Action** | | **System Response** | |
| 1 | This action starts when a customer clicked at feedback button | 2 | System shows the purchase history and a place to rate and to write somethings |
| 3 | Customer rate the products by starts or he writes a note | 4 | System save it and shows it in next time to all customers. |
| 5 | Customer can continue shopping. |  |  |
|  |  |  |  |
|  |  |  |  |

**Use Case User registration**

*Name: User registration.*

*Actors: visitor, Admin.*

*Purpose: Creating a new account for the visitor.*

*Description: A visitor starts registration with his email address, delivery address, phone number, name and password.*

*Cross Reference*:

Pre-Conditions: --

Successful Post-Conditions: *Visitor become a customer.*

Failure Post-Conditions: *email address is not valid or unique or the password is not strong enough*.

|  |  |  |  |
| --- | --- | --- | --- |
| **Typical Course of Events** | | | |
| **Actor Action** | | **System Response** | |
| 1 | This action starts when a visitor clicked at the register button | 2 | System shows the registration form to the visitor |
| 3 | Visitor fill all mandatory fields and click at the register button. | 4 | System check the entered data and also password policy and return a message to visitor. |
| 5 | Visitor become customer and able to login. |  |  |
|  |  |  |  |
|  |  |  |  |

**Use Case Adding items to inventory**

*Name: Adding Items to the inventory.*

*Actors: Admin.*

*Purpose: add a new item to the inventory.*

*Description: Admin can add a new product to the inventory.*

*Cross Reference*: *Admin must login first.*

Pre-Conditions: --

Successful Post-Conditions: *System have a new product.*

Failure Post-Conditions:

|  |  |  |  |
| --- | --- | --- | --- |
| **Typical Course of Events** | | | |
| **Actor Action** | | **System Response** | |
| 1 | This action starts when Admin clicked at the add product button | 2 | System shows the new product for to the admin |
| 3 | Admin fills all mandatory fields and click at the add button. | 4 | System check the entered data and make a new record in database. |
| 5 | Admin will back to the product list. |  |  |
|  |  |  |  |
|  |  |  |  |

**Use Case Reporting**

*Name: Reporting.*

*Actors: Admin.*

*Purpose: Getting a report with customized criteria.*

*Description: Admin defines criteria for sale report and takes some data by the report.*

*Cross Reference*: *Admin must login first.*

Pre-Conditions: --

Successful Post-Conditions:

Failure Post-Conditions:

|  |  |  |  |
| --- | --- | --- | --- |
| **Typical Course of Events** | | | |
| **Actor Action** | | **System Response** | |
| 1 | This action starts when Admin clicked at the report button | 2 | System shows the report form to the Admin |
| 3 | Admin define the report criteria and press show report. | 4 | System prepare a report by the entered data for admin. |
| 5 |  |  |  |
|  |  |  |  |
|  |  |  |  |

Document each use case. This can completed using the tables provided below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Section: Main | |  | | | | |
| *Name:* | | Login | | | | |
| *Actors:* | | Customer | | | | |
| *Purpose:* | | Login to system by email address and password. | | | | |
| *Description:* | | A customer provides his email address and password to login | | | | |
| *Cross References:* | | Use Cases: Cashier must have completed the Log In use case. This is a reference to the System Functions as described in Section 1.10 | | | | |
| Pre-Conditions | | Assumption about the state of the system before execution of the operation | | | | |
| Successful Post-Conditions | | State of the system after completion of the operation. | | | | |
| Failure Post-Conditions | | State of the system after completion of the operation. | | | | |
|  | |  | | | | |
| Typical Course of Events | | | | | | |
| Actor Action | | | | | System Response | |
| 1 | This use case begins when a customer arrives at the Point of Sale checkout with items to purchase. | | | |  |  |
| 2 | The cashier records each item | | | | 3 | Determines the item price and adds the item information to the running sales transaction. |
| 4 | … | | | | 5 | … |
| 7 | Customer selects payment type:   1. If cash payment, see section Pay by Cash 2. If credit payment, see section Pay by Credit | | | |  |  |
|  |  | | | | 8 | Logs the completed sale |
|  |  | | | | 9 | Updates inventory levels |
|  |  | | | | 10 | Generates a receipt |
| 11 | Cashier gives the receipt to the customer | | | |  |  |
| 12 | The customer leaves with the items purchased | | | |  |  |
|  | | | |  | | |
| Alternative Course | | | |  | | |
| *Step 2:* | | | | Invalid item identifier entered. Indicate error. | | |
| *Step 7:* | | | | Customer could not pay. Cancel sales transaction | | |
| Section: Pay by Cash | | | |  | | |
| Typical Course of Events | | | |  | | |
| Actor Action | | | | | System Response | |
| 1 | The customer makes a cash payment | | | |  |  |
| 2 | The cashier records the cash tendered | | | | 3 | Presents the balance due back to the customer, if any. |
| 4 | The Cashier deposits the cash received and extracts the balance owing and gives it to the customer | | | |  |  |
| Alternative Courses | | |  | | | |
| *Step 1:* | | | Customer does not have sufficient cash, may cancel sale or initiate another payment method. | | | |
| *Step 4:* | | | Cash drawer does not contain sufficient cash to pay balance. | | | |

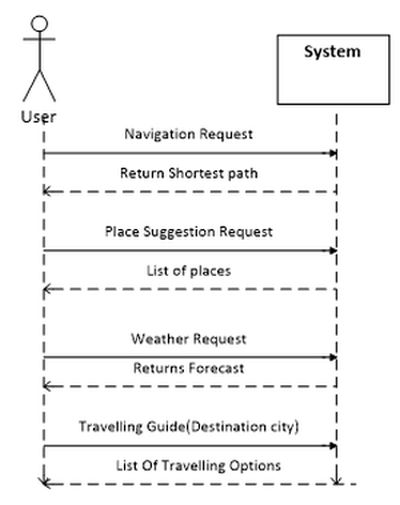
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Section: Main | |  | | | | |
| *Name:* | | Login | | | | |
| *Actors:* | | Customer | | | | |
| *Purpose:* | | Login to system by email address and password. | | | | |
| *Description:* | | A customer provides his email address and password to login | | | | |
| *Cross References:* | | Use Cases: Cashier must have completed the Log In use case. This is a reference to the System Functions as described in Section 1.10 | | | | |
| Pre-Conditions | | Customer already registered his account. | | | | |
| Successful Post-Conditions | | Customer is able to purchase. | | | | |
| Failure Post-Conditions | | Customer can recover his password. | | | | |
|  | |  | | | | |
| Typical Course of Events | | | | | | |
| Actor Action | | | | | System Response | |
| 1 | This use case begins when a customer click on the login button. | | | |  |  |
| 2 | The customer provides his email and password and press log in button. | | | | 3 | System compare the entered data with the database. |
| 4 | The customer is able to add item(s) to cart | | | | 5 | … |
|  |  | | | |  |  |
|  |  | | | |  |  |
|  |  | | | |  |  |
|  |  | | | |  |  |
|  |  | | | |  |  |
|  |  | | | |  |  |
|  | | | |  | | |
| Alternative Course | | | |  | | |
| *Step 2:* | | | | Invalid item identifier entered. Indicate error. | | |
| *Step 7:* | | | | Customer could not pay. Cancel sales transaction | | |
| Section: Pay by Cash | | | |  | | |
| Typical Course of Events | | | |  | | |
| Actor Action | | | | | System Response | |
| 1 | The customer makes a cash payment | | | |  |  |
| 2 | The cashier records the cash tendered | | | | 3 | Presents the balance due back to the customer, if any. |
| 4 | The Cashier deposits the cash received and extracts the balance owing and gives it to the customer | | | |  |  |
| Alternative Courses | | |  | | | |
| *Step 1:* | | | Customer does not have sufficient cash, may cancel sale or initiate another payment method. | | | |
| *Step 4:* | | | Cash drawer does not contain sufficient cash to pay balance. | | | |

## System Sequence Diagrams

This is an optional section. It may help when the Typical Course of Events (Section 3.4) is too detailed to clarify the flow properly.

A system sequence diagram is a picture that shows, for a particular scenario of a use case, the events that external actors generate, their order, and intersystem events. All systems are treated as a black box; the emphasis of the diagram is events that cross the system boundary from actor to systems.

A system sequence diagram should be completed for the typical course of events of the use case, and possibly others, for the most interesting alternative courses.



## User Interface

This section may be used to provide screenshots of the application to give an idea of how the GUI will appear.

## Data Dictionary

This section may be used to provide the details of interface elements that are present on the screenshots.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element Name | Type | Validation | Mandatory | Remarks |
|  |  |  |  |  |

# Glossary

A glossary or model dictionary lists and defines all the terms that require clarification in order to improve communication and reduce the risk of misunderstanding.

Record domain or business terms, rules, concepts, etc. in the glossary

|  |  |
| --- | --- |
|  | Comments |
| *DS* | *DS stands for Directing Staff, a class instructor* |
| *Div* | *Stands for a Division with fixed strength and organization* |
| *Package* | *….* |
|  |  |

# Appendices

Include supporting detail that would be too distracting to include in the main body of the document.