SOFTWARE DESIGN DOCUMENT

FOR

ANKA BUSINESS SUPPORT SERVICES

GITHUB LINK:

https://github.com/Aurits/ANKA_BUSINESS_SUPPORT.git

G-30

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1. INTRODUCTION

1.1 Purpose

This software design document describes the architecture and system design of Anka business support services. This SDD consists of different sections that explain in detail what the system does. It is intended to help the reader to understand the inner design and functioning of the system.

1.2 Scope

ANKA Business Support Solutions is a system that supports participants to post their products via the command line interface built with JAVA and the products can be accessed via the web interface which is built by PHP by the customers. The posted products with their description are stored in the MYSQL database. The participants are awarded points, recognition and promotion depending on the performance of the products. The administrator logs into the system, and views reports generated from the competition.

1.3 Overview

The main objective of the design document is to analyze and understand system in detail. In this way, the features comprise parts of feasible solution are identified and then documented.

During design phase, the focus shifts from “whether to how” i.e. we try to answer the question of how to build the system.

Activities used in the design document:

Introduction (Section 1)

This section describes the purpose of the SDD, the scope of the product which describes the description, goal and objectives of the product, the reference materials and the abbreviations used in this document.

System overview (Section 2)

This section gives a general description of the functionality, context and design of the ANKA business support services.

System architecture (Section 3)

This comprises of the architectural design which consists of the system diagram that shows major subsystems and data repositories and their interconnections, decomposition of the system and the design rationale which gives a reason for choosing the used design.

Data design (section 4)

This comprises of the data description that explains how the information domain of the system is transformed into data structures and the data dictionary that alphabetically lists the system entities.

Component design (section 5)

This describes what each component does in a more systematic way.

Human interface design (section 6)

This explains how the users will be able to use the system and also displays screenshots showing the interface from the user's perspective.

1.4 Definitions and Acronyms

PHP – Hypertext Preprocessor

MYSQL – My structured Query Language

SDD – Software Design Document

CLI – Command Line Interface

OO –Object Oriented

DBMS –Database Management System

OS – Operating System

CSS – Cascading Style Sheets

2. SYSTEM OVERVIEW

ANKA Business Support Services is an application software which helps business owners to easily register merchants and helps customers purchase products of the merchants. The business software can be thought about like a utility. It reduces the time spent if the lob was done by humans. It has three kinds of users: participants, customers and administrators. It handles data ranging from text to long integers. It is secured by authorization techniques that reduce illegal usage. It performs basic business transactions which ensure that there is seamless collaboration between the software users.

The software uses a framework Laravel which is a PHP based. This framework in cooperates JavaScript, PHP, HTML and CSS. The framework handles the frontend of the software. The Laravel is configured to the MYSQL DBMS. It is a relational database management system that has databases that are used to store the software's information.

The backend of the system is built with java which is an OO language. Java is used to build the command line interface which is majorly used by the participants. The java is majorly used to collect information which is then stored in the file by a cron job.

A cron job is Unix-linux kind of utility software inbuilt in most OS. The cron job is configured to run periodically i.e. after five minutes. The cron job is written in java and invoked after the set time. It is majorly used to save information from the text file to the database.

The system uses a server to accept client requests and save files. The software is configured to use local resources and no external networks are used.

3. SYSTEM ARCHITECTURE

3.1 Architectural Design

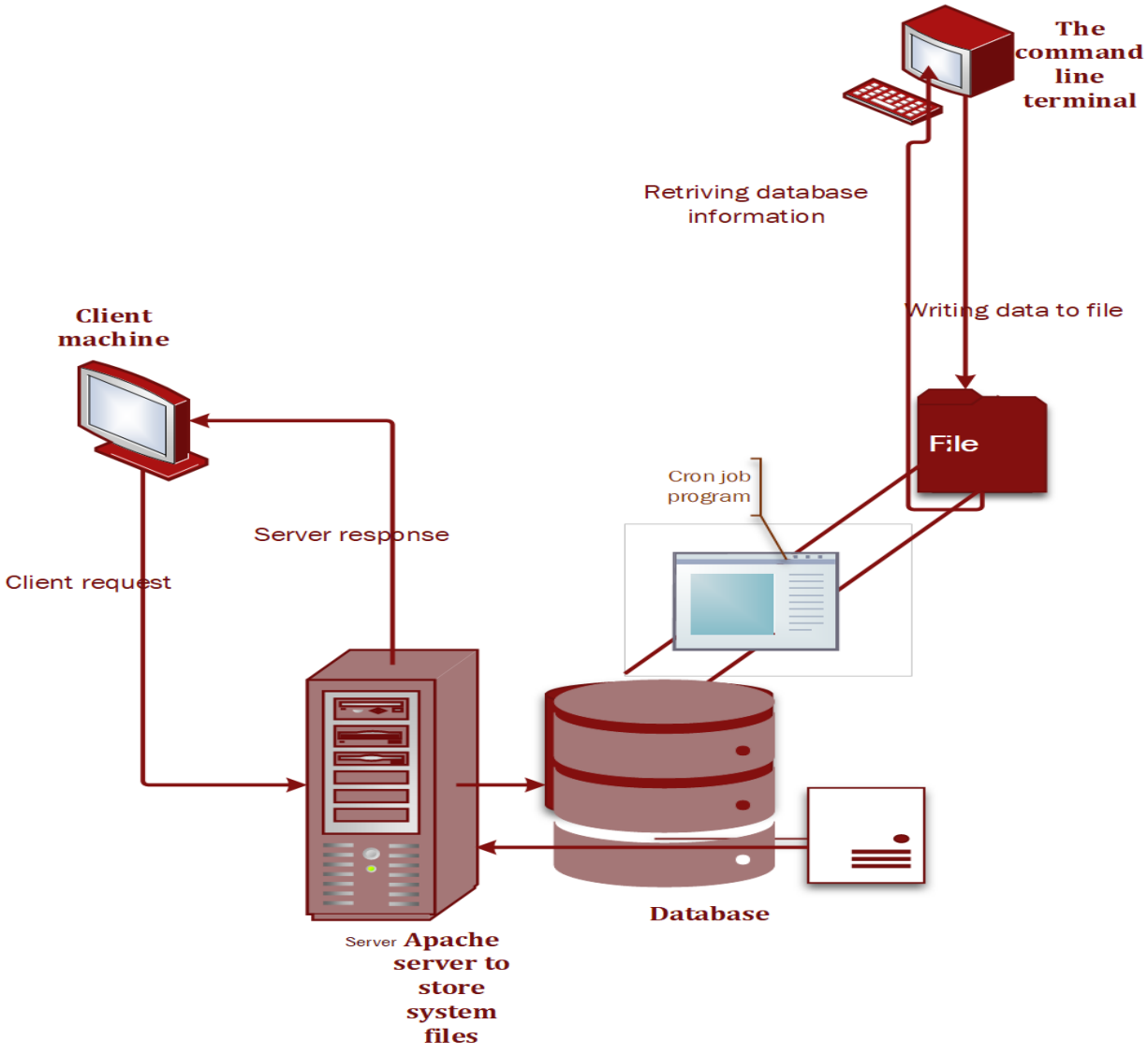

figure 3.1. 1The architectural design of the entire system

The system is made up of the Client-side computer, the Apache server, the Database, a Cron job program and another Administrator Computer which is operated via the command line. The command line is use to register products that are to be ordered for by the customers. The product name and description are first stored in the file while this data is periodically picked by the cron job program and stored in the database.

On the other end, the client can log in into the system as a customer and does sends request to the server that connects to the database to query information about the products and retrieved to the customer for booking.

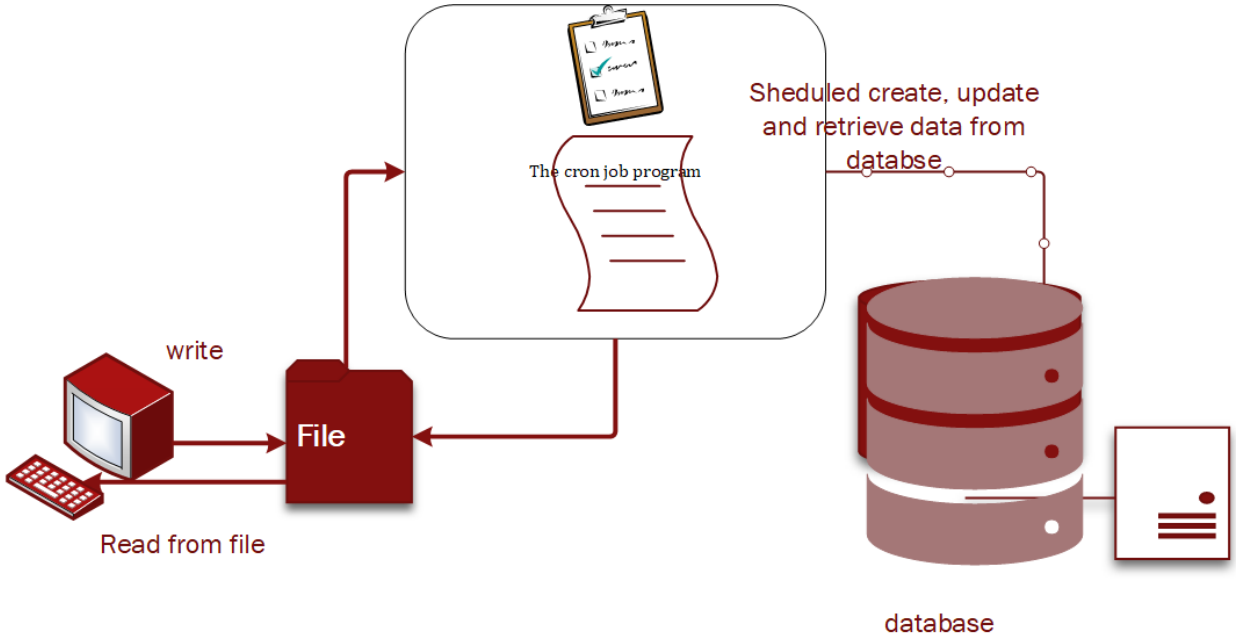

figure 3.1. 2The process of the cronjob that does fetch data to and from the file

There is also a cron job program that runs periodically in the system. When the participant does register a product through the terminal, the data is first stored into the fired where this program does pick it to store it into the database at scheduled intervals.

Similarly, when a participant wants to get information from the database about the products availability and any other related information like one's performance, the request is first recorded on the file as the cron job program picks it and returns the required information to the participant at given interval. The time of request, recording and response is also stored in the database.

The system has the following components.

Server

This is where all the files for the system are stored and it does respond to client requests. It enables the client to search for the products from the database through the php script files that it stores. It therefore enables the client to access the information they need.

Database

The database is responsible to store the information about the products that are registered by the participants. It also stores the necessary information about the clients and the participants thus enables the administrators to track the participants present and their customers thus determine the best performing client.

Command line

This component is used to register the participants on the system and also use to register their products so that they can be accessed by the customers on the web interface for booking. It is used to enter data to the database through the file.

Client

This is the part of the system that the users use to access the system. They use the web interface. They send requests to the server that are responded by the server that at times fetches some information from the database and then returned to the user. It is used by the customers to book products, administrators to query the reports about the performance and also award the best performing participant that is shown on the homepage of the system website.

File

This is where data from the command line is first stored before being sent to the database by the cron job program, and also its where responses from the database to participant requests are first recorded before being viewed by the participant.

3.2 Decomposition Description

For the ANKA business support services system , we follow an object-oriented approach to develop the system. The various objects work interactively with one another to enable the participants post the products on the system making the available for the customers to book.

Use Case Diagram

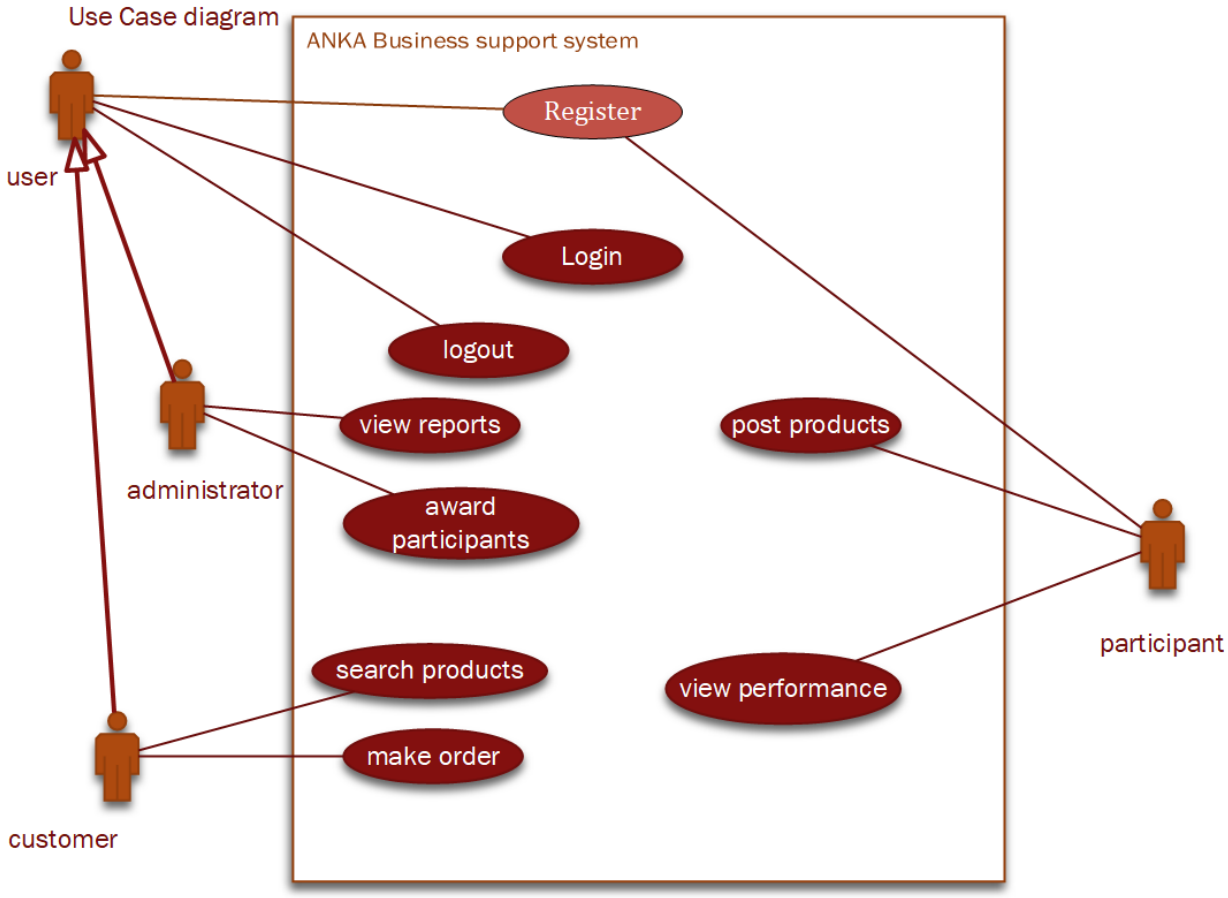

figure 3.2. 1The use case diagram for user scenarios of the different users

Figure 3.2.1 shows the detailed view of the system and how the different actors would interact with each other and with the system so that every user gets the required output from the system after they have satisfied the given conditions.

Class Diagram

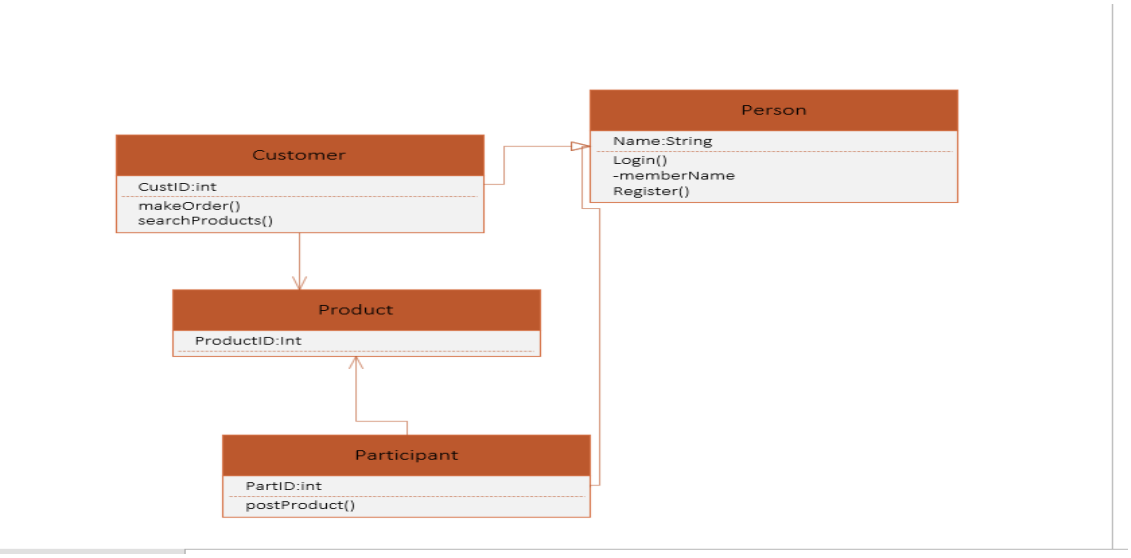

figure 3.2. 2Class diagram for the system

Object Diagram

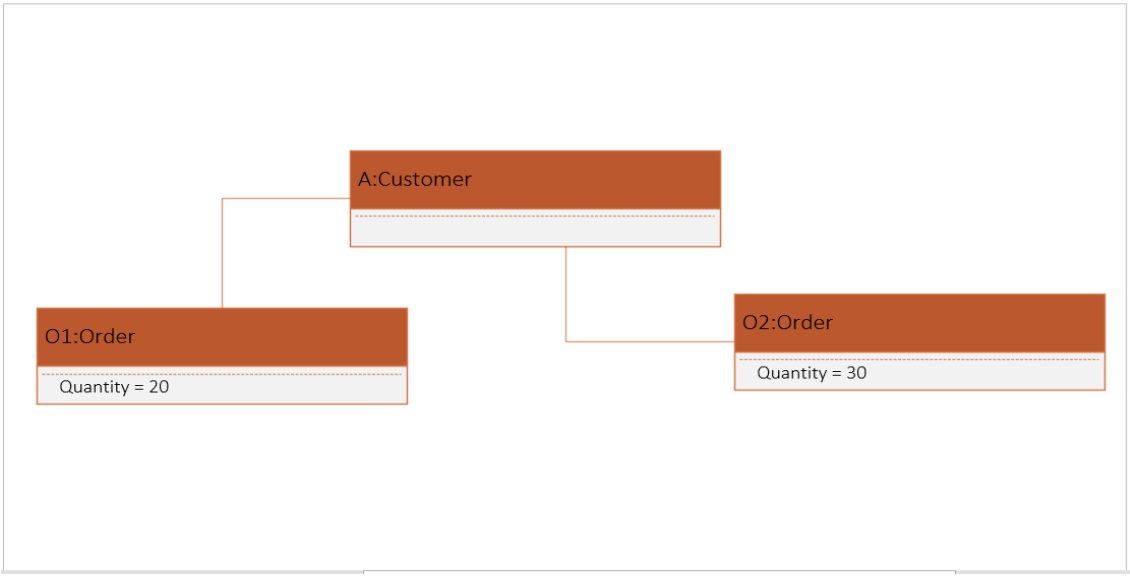

figure 3.2. 3Object diagram for the system

Activity diagrams

The activity diagrams show a detailed flow of the activities that are performed by the different users on the system so that each of them achieves a given goal from the system. There are different activity diagrams illustrating the flow of activities for the different users of the system.

User login to the system activity diagram

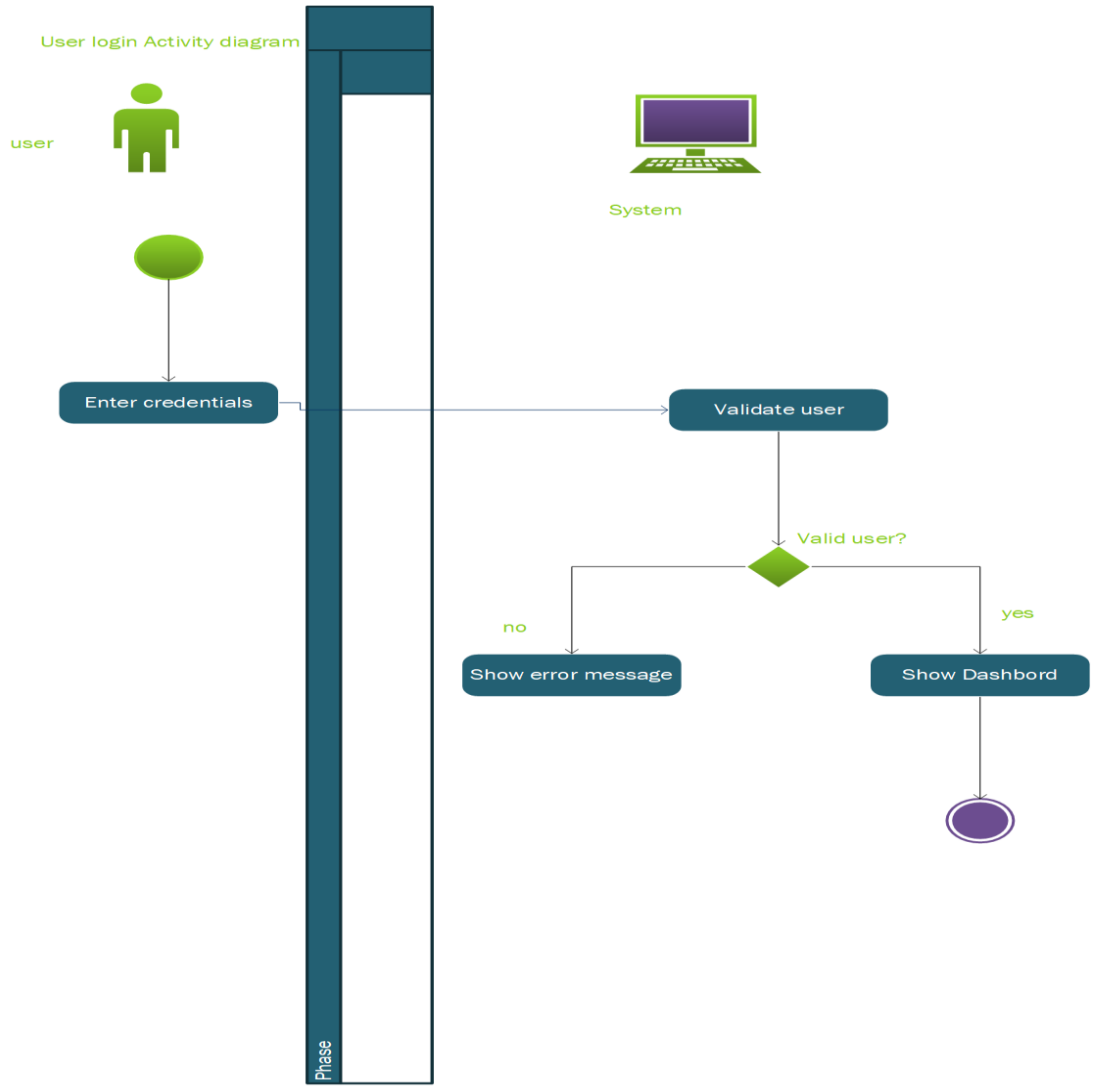

figure 3.2. 4Activity diagram for user login

Administrator querying the database for best performing participant activity diagram

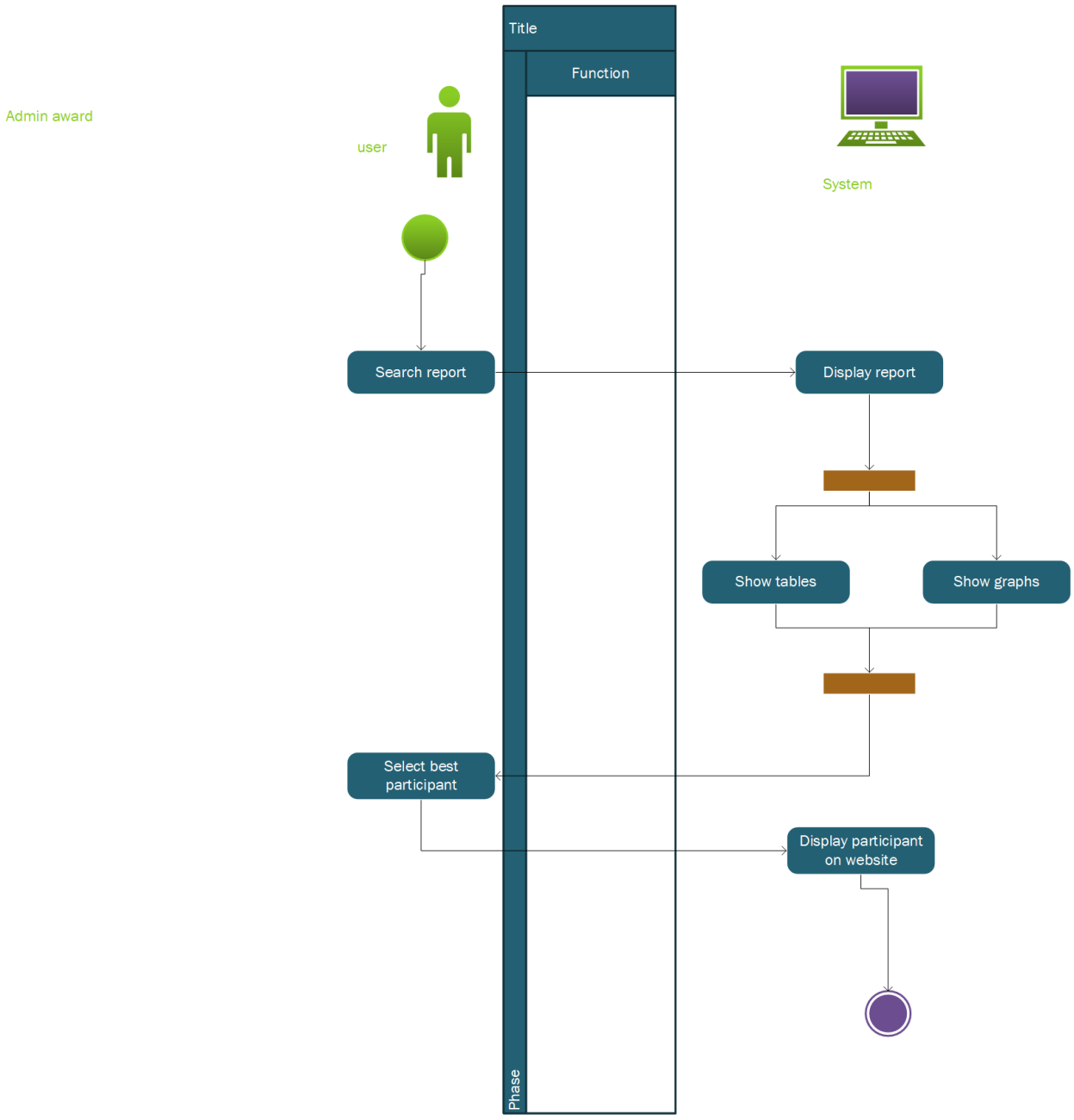

figure 3.2. 5Activity diagram for the administrator

Customer making order for products on the system activity diagram

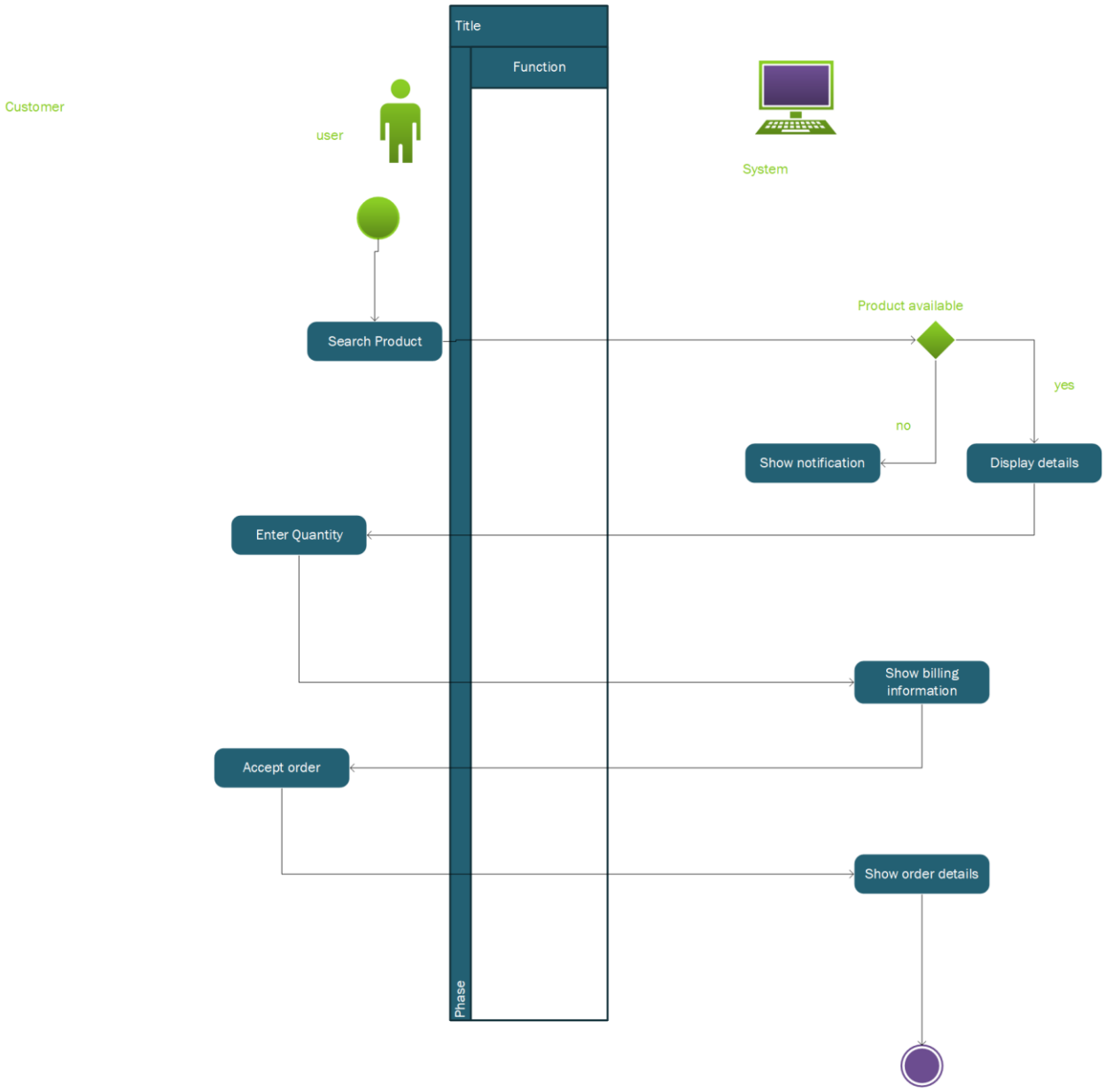

figure 3.2. 6Activity diagram for the customer

Participant posting products to the website and viewing one's performance activity diagram.

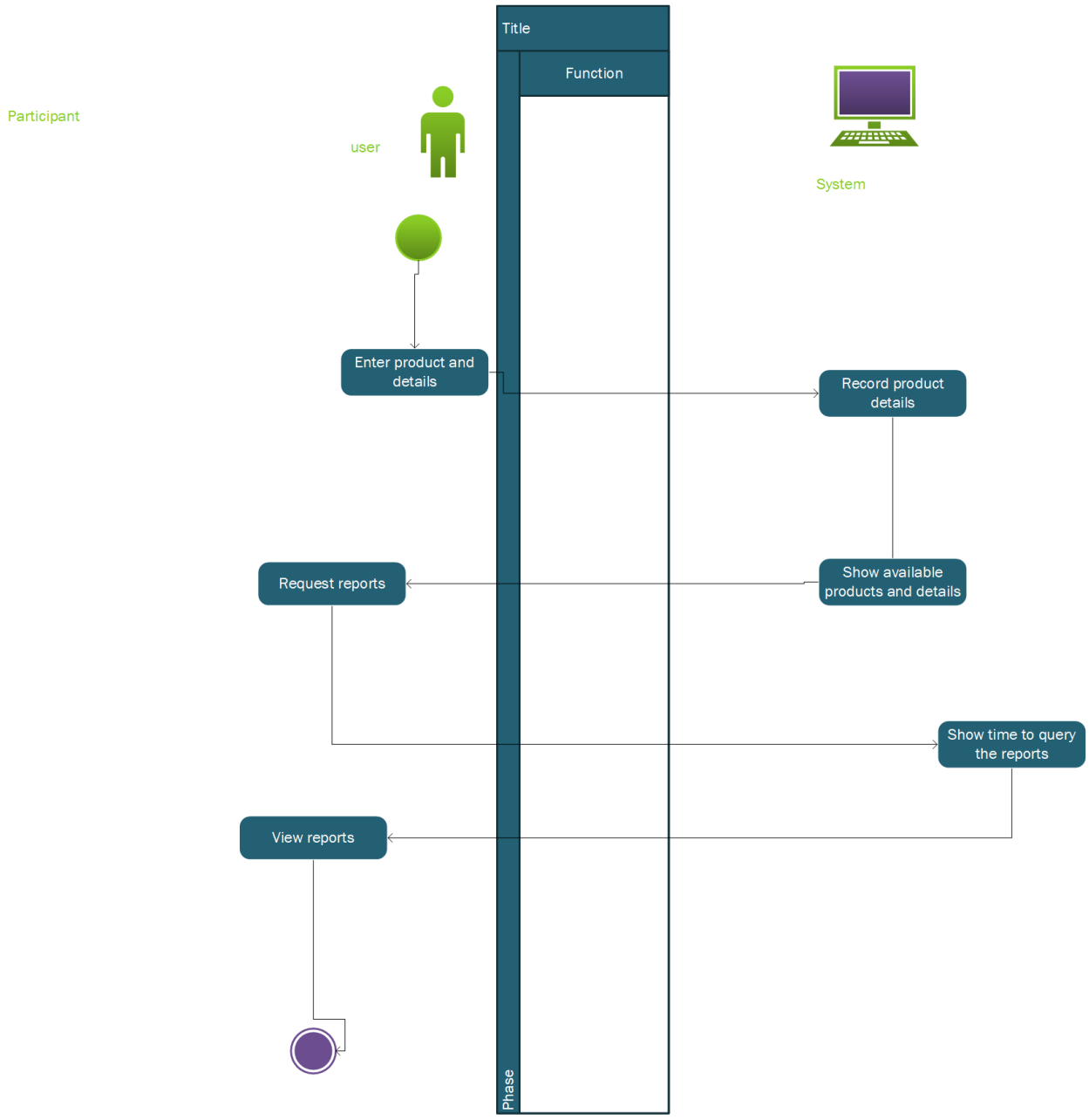

figure 3.2. 7Activity diagram for the participant

3.3 Design Rationale

The system going to be designed with a central data repository, that stores all the data about the products posted by the participants and are accessed from the database by the client-side users. There is a file that stores data temporary from the participant command line and another program that continuously runs to fetch this data on the file and stores it in the database. This program also does fetch customer requests from the file and returns the response to the file where they are later read from the file by the client from the terminal. The object-oriented paradigm is considered for the project because it is easy to troubleshoot given the modularity used, reuse of the code through inheritance and effective through polymorphism thus easing the problem solving.

For structured programming, reusability of code ,readability and security would be a bit hard to implement thus choosing object-oriented approach for the development of the system thus making it secure, efficient and reliable for the users to attain their needs while using the system

4. DATA DESIGN

4.1 Data Description

This is where data attributes are explained.

ENTITY	ATTRIBUTES
Customer	customerName
	address
	status
product	productName
	productID
	quantity
	rate
	description
participant	Password
	participantID
	participantName
	dateOfBirth
perfomanceReport	participantName
	awardName
businessAdministrator	password
	logInTime
	LogoutTime
booking	bookingNumber
	productName
	customerName
ProductCategory	categoryId
	name

Table 4.1. 1Database entities with respective attributes

The data design of the system is based on enhanced entity relational modeling approach which is represented by the EERD (Enhanced Entity Relational Diagram) below.

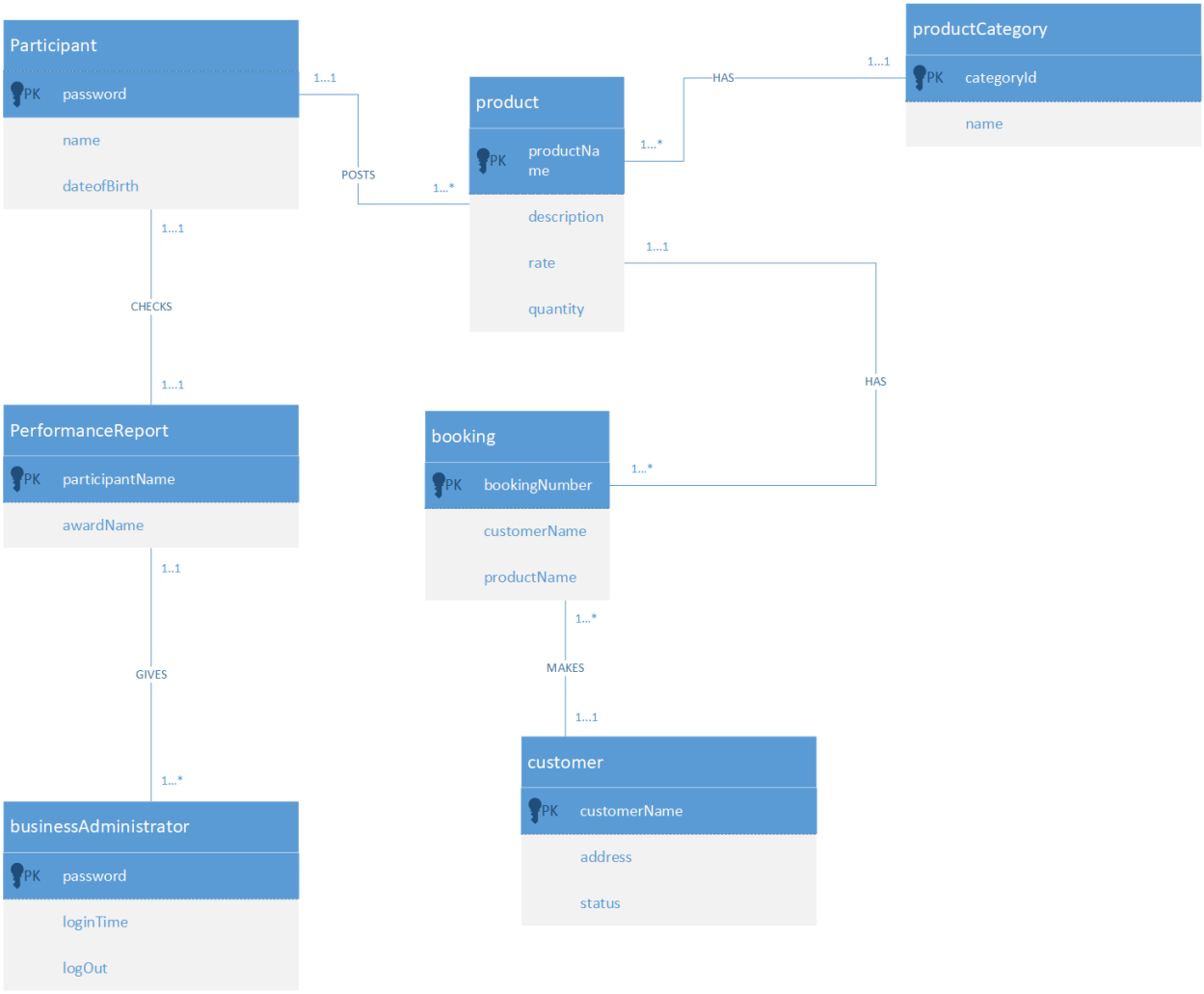

figure 4.1. 1Eerd for the entities of the system in database

PHYSICAL DESIGN

Customer

Attribute	Data type	size	key
customerName	varchar	30	Primary key
address	varchar	30	
status	varchar	40	

Table 4.1. 2Customer

Participant

Attribute	Data type	Size	Key
ParticipantID	int	10	Primary key
password	varchar	15	
participantName	varchar	25	
dateOfBirth	date	10	

Table 4.1. 3Participant

Product

Attribute	Data type	size	key
productID	int	10	Primary key
productName	varchar	30	
description	varchar	250	
quantity	int	8	
rate	int	50	

Table 4.1. 4ProductTable

PerformanceReport

Attribute	Data type	size	key
participantName	varchar	30	Primary key
awardName	varchar	30	

Table 4.1. 5PerformanceReport

BusinessAdministrator

Attribute	Data type	size	key
Password	varchar	30	Primary key
logInTime	date		
logOutTime	date		

Table 4.1. 6BusinessAdministrator

Booking

attribute	Data type	size	key
BookingNumber	Int	10	Primary key
ProductName	Varchar	30	Foreign key
CustomerName	varchar	30	Foreign key

Table 4.1. 7Booking

ProductCategory

attribute	Data type	size	Key
CategoryId	Int	10	Primary key
name	varchar	30	

Table 4.1. 8ProductCatergory

4.2 Data Dictionary

Customer

Attribute	Data type	size	description
Customer Name(PK)	varchar	30	This unique attribute is used to identify the user by his name.
address	varchar	30	This attribute is used to identify the location of the customer
status	varchar	40	This attribute is used to identify whether the customer is a first time or old customer.

Table 4.2. 1Customer

Participant

Attribute	Data type	Size	description
ParticipantID{pk}			This is a unique attribute used to identify the ID of the participant.
Password	varchar	15	This is an attribute used to identify the password of the participant.
participantName {fk}	varchar	25	This is an attribute used to identify the name of the participant
dateOfBirth	date	10	This attribute is used to identify the date of birth if the participant.

Table 4.2. 2Participant

Product

Attribute	Data type	size	description
productID{pk}	int	10	This unique attribute is used to identify the id of the products
productName	varchar	30	This attribute is used to identify the name of the products.
description	varchar	250	This attribute is used to identify the description of the products

quantity	int	8	This attribute is used to describe the amount of available products.
rate	int	50	This attribute is used to identify the price rate of the products.

Table 4.2. 3Product

PerformanceReport

Attribute	Data type	size	Description
participantName {pk}	varchar	30	The attribute is used to identify the participant name in the performance Report table
awardName	varchar	30	This attribute is used to identify the awardName in the table

Table 4.2. 4PerformanceReport

BusinessAdministrator

Attribute	Data type	size	Description
Password {pk}	varchar	30	This attribute represents the password of the administrator.
logInTime	date		This attribute identifies the time at which the administrator logs in.
logOutTime	date		This attribute identifies the time at which the administrator logs out of the system

Table 4.2. 5Administrator

Booking

attribute	Data type	size	description
BookingNumber {pk}	Int	10	This attribute is used to identify the booking number which is identifies the booking.
ProductName {fk}	Varchar	30	This attribute is used to identify the name of the product.
CustomerName {fk}	varchar	30	this attribute is used to identify the name of the customer.

Table 4.2. 6Booking

ProductCategory

attribute	Data type	size	description
categoryId {pk}	Int	10	This attribute is used to identify the the category which by id.
categoryName	varchar	30	This attribute is used to identify the name of the category.

Table 4.2. 7ProductCatergory

5. COMPONENT DESIGN

User Details

Start

If command corresponds

Prompt user for name;

If name is not null

Prompt user for password;

If old user and details true

Login;

Access Homepage;

If old user and details false

Return an error message;

If user is new

Prompt user for name;

Prompt user for password;

Prompt user for product;

Prompt user for Date of Birth;

Register User;

Log in;

Access homepage;

Stop.

Table 5. 1Capture User Details

Data Request

Start

While(true)

Cron job picks information from the file and inserts into database

If a participant makes a request for updates

Request is sent to file;

If Cron runs for next request

Time on request is shown;

Time on response is shown;

Time on response view is shown;

Information is then stored in Database;

Stop

Table 5. 2Data Request

Awarding

Start

For every product bought

If customer buys one product

Participant is awarded one point;

If customer returns to buy another product

Participant is awarded 2 points;

If customer returns to buy more than one product

Participant is awarded 4 points;

Cumulative points awarded are summed up;

For

report generated on home page

If participant has highest cumulative points

Award is given to participant;

Award is stated in home screen;

Stop

Table 5. 3Awarding

Product

Start

For

every product

Enter product details;

Show product quantity availability;

If product is bought

Available quantity reduces by 1 (-1);

Enter rate per time;

Stop

Table 5. 4Booking

Report Generation

Start

For

every report generated

If report is generated in table form

Return tables;

If report is generated in graph form

Return graph;

If report is generated on dashboard

Show dashboard;

Stop

Table 5. 5Report generation

6. HUMAN INTERFACE DESIGN

6.1 Overview of User Interface

ANKA Business Support Services will be used by the participants, customers and an administrator to carry out five main activities. The participants will: join the competition using their personal information, post their products and descriptions. The participant will be able do all of this using the CLI.

The customers will be able to: book for the products, browse and see participant information. The customer uses the web interface.

On the web interface, administrators can sign in and view the reports.

Joining Competition.

The user(participant) is also a merchant who is not registered in the software. Using their name, password of choice and date of birth the user is able sign up. He is prompted to enter the password only after he has entered his name. He does this after selecting the command corresponding to this functionality. The participant is continuously prompted as this step is crucial. The participant cannot access the other functionalities without completing this functionality.

The participant does not have to do this step every time he uses the CLI. A registered participant will use the log in function. During Log in, the user will be prompted for his name and password.

Posting Products and respective Descriptions.

The Participant will be able to post their products after signing up or logging in. The products can be only of one kind i.e. sells stationary only. Once the participant verifies the kinds of products, he then gives a detailed description which includes but not limited to available

quantity and rate price. The participants may increase their products but they are required to add a description too. The participant can request for an update. This update will be show the next time he logs in.

Booking Products

The Users(customers) will be able to book products of interest. This will be on web interface which has all the participants. The web page offers many other functionalities as shall be discussed. The customer will use the description of the participants' products to identify the products. The customer can then select the product. The customers are prompted to enter their details(name, address and password) before the item is purchased. Once filled, the items can then be purchased. The returning customer will sign up. And their information will be loaded on the page. Once item is purchased, the item number will automatically decrease.

Browse and view participant Information.

The customers interested in the individual participants shall use the same page to access the participants details. The customer simply clicks on the participants tab which reveals all the details. The customers will be able to view the products sold by the particular participants. The viewed participants won't know. The customer has constraints to some of this information for example they cannot see the date of birth. The customers can use this information to contact the participant.

Signing in; Report viewing

The reports generated by the software can be viewed by the administrator. He must sign in on the web interface using his name and password. His functionalities are limited to viewing since most of the work is done by the software. The administrator can view the best performing participant and award him too. The points earned by each of the individual participants are shown on the page.

6.2 Screen Images

Home Page

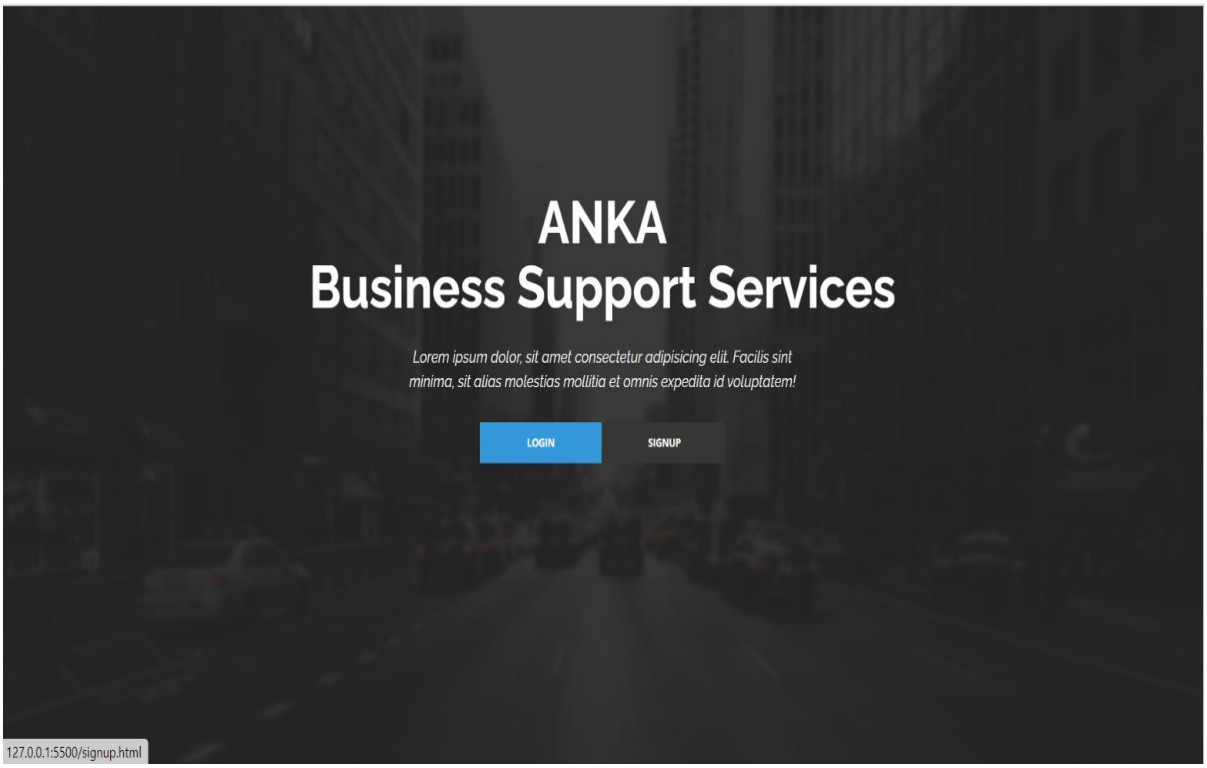

figure 6.2. 1Homepage of ANKA business support system website

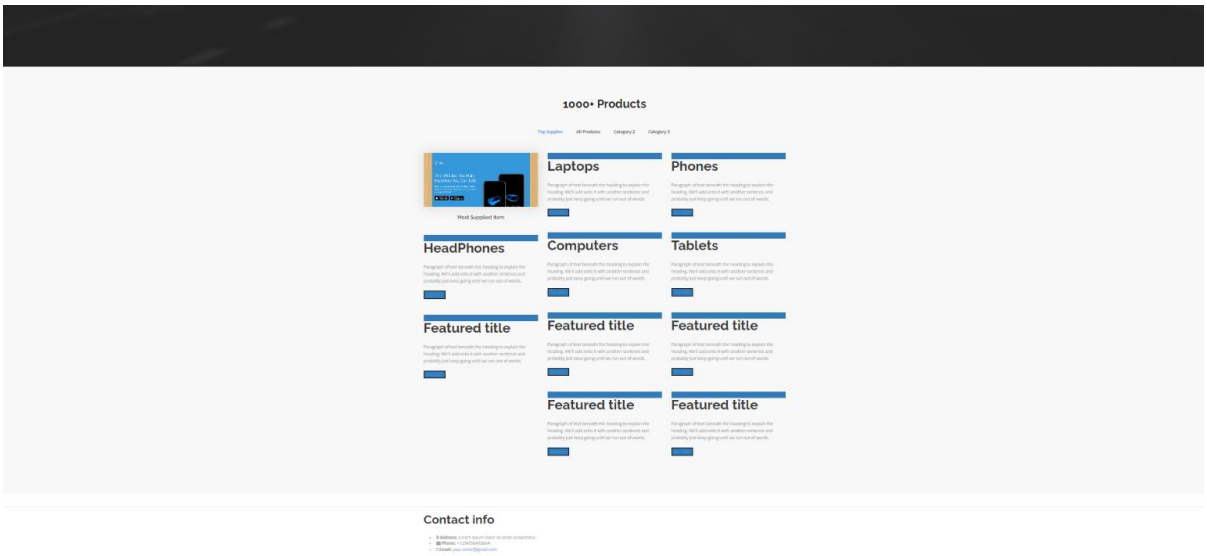

figure 6.2. 2Product section on the website

Joining Competition, posting products and respective descriptions.

figure 6.2. 3Command line Interface for participants to post products

Purchasing Products

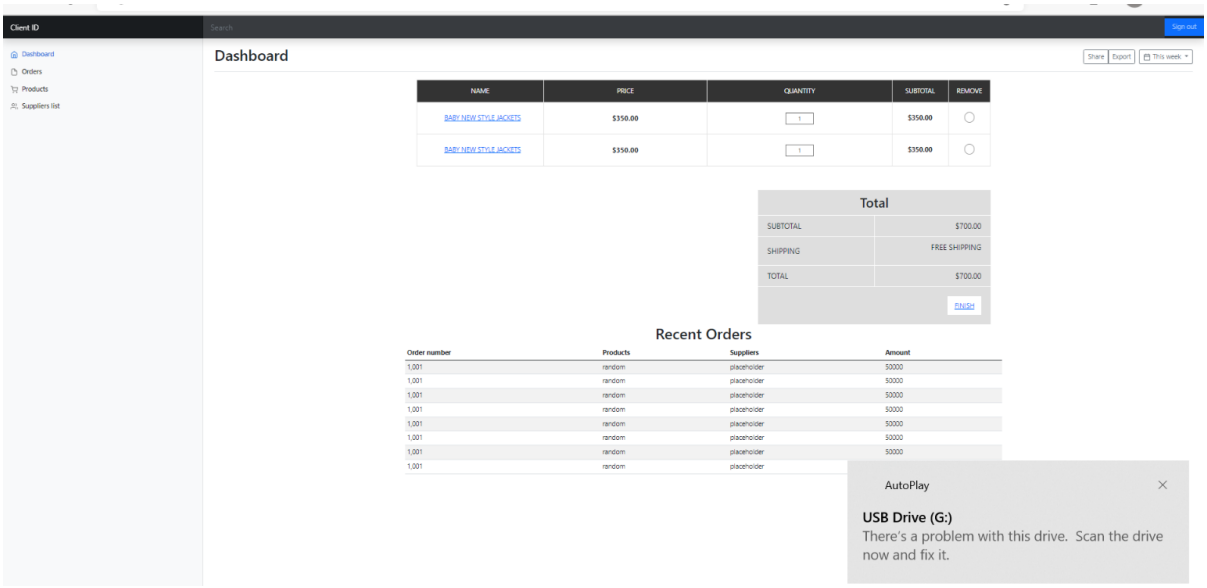

figure 6.2. 4Ordering section for customers to request products

Logging in;

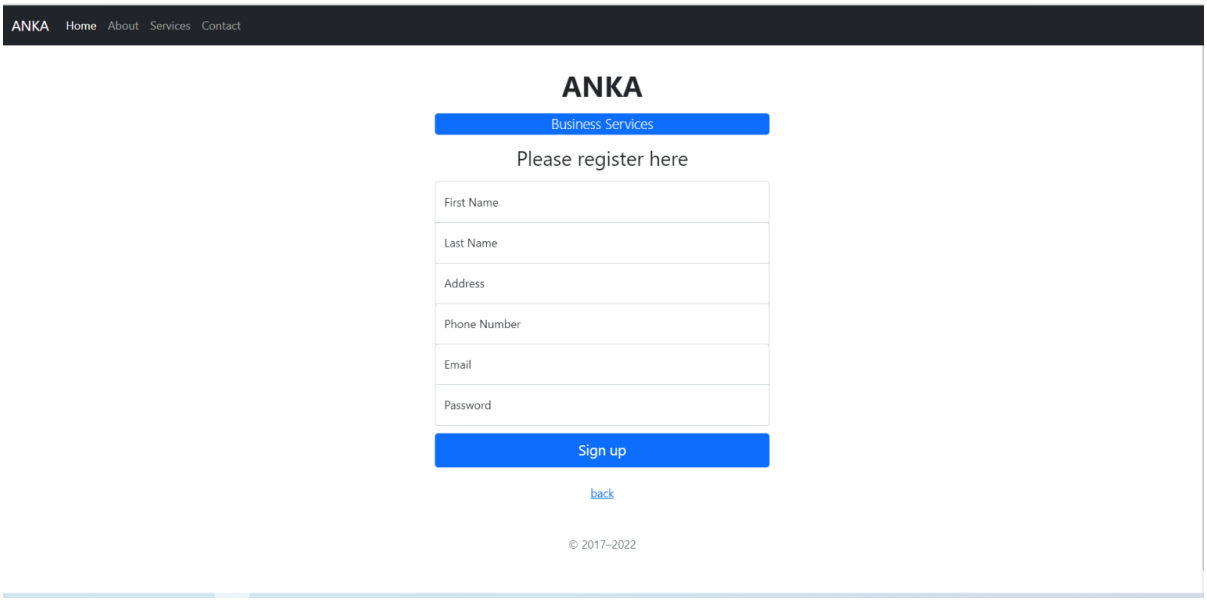

figure 6.2. 5login Screen for users to access the system via the web interface

Report viewing

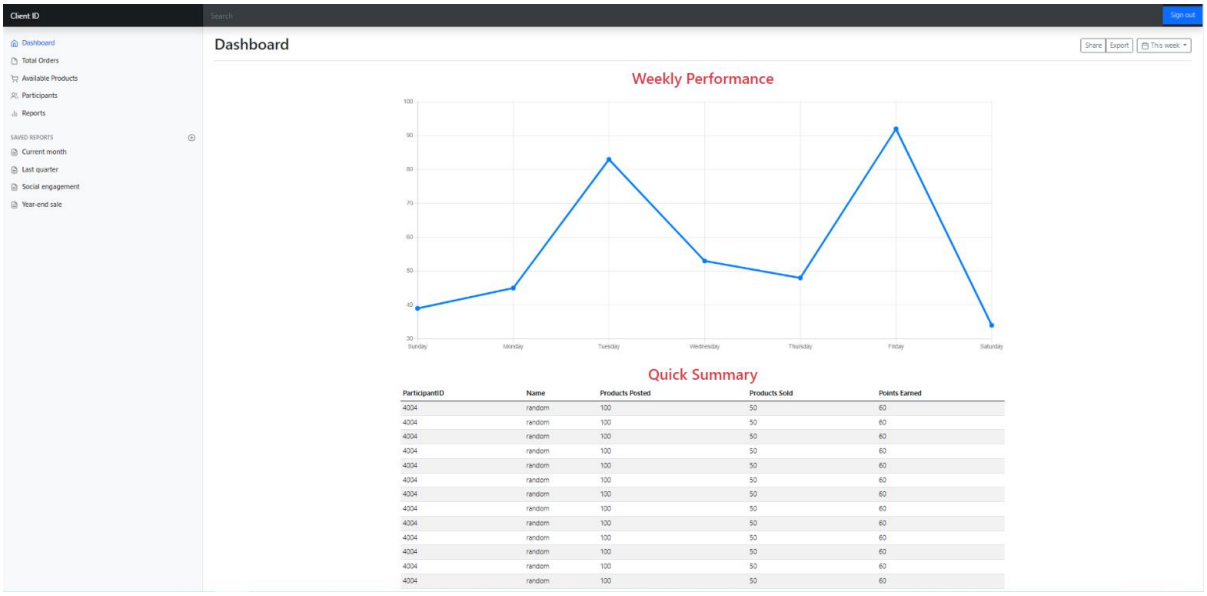

figure 6.2. 6Administrator Dashboard to view reports and award participants