

1.Introduction of the System

In our daily lives we all need some products or services in some way. In this consumption life, we all want to access these products or services in a cheap way. Large companies are applying many different advertising strategies to reach us. Due to these strategies, we can be aware of the campaigns and discounts of the big companies that reach us every minute, but it is not so easy to reach the campaigns and discounts of small businesses. In addition, we have another question to answer: Are big brands really discounting?

Discounts are something people use when they want to buy a particular product or service. Most discounts work on the principle of urgency; discounts are only available for a certain period of time. People think that if they don't buy the product now at a discounted price, they will miss this opportunity. Due to this principle of urgency, large firms are always influential on the psychology of customers. Mostly, the discounts made by large firms are not real. For example, the price of a product that is already 100 pounds, 200 pounds is shown by showing a 50% discount and the price is reflected to the customer again 100 pounds. Customers want to buy the product in a hurry to miss the principle of urgency and discount. This method, which is used mathematically by big firms, is deceptive and they even sell the product to customers for more money.

In addition, we can only see discounts from large companies in daily life, because these companies have a large budget for advertising. However, since small businesses do not have advertising budgets, people can only reach the campaign and discounts by chance. For example, suppose that a coffee shop in Kızılay, the center of Ankara, offers a 50% discount every weekday from 9 to 12 for coffees. The only way to be aware of this discount is to be a customer of that shop or to pass by that shop and notice the discount on that day.

The main purpose of this system is to avoid the misleading reductions mentioned above, to allow small businesses to advertise and to increase the competition in the market and mobilize the market:

- The normal price lists and discounted price lists of the enterprises in the system are followed with data analysis methods to prevent misleading discounts.
- Allow small businesses without advertising budgets to make their name known through promotions.
- To increase the competition in the market through the application and to ensure that prices are cheaper.

1.1. System/ Project Request Form

Request Date : 1.12.2019

Project Title : Data Based Campaign Tracking System

Project Owner : OFFERASTIC

Budget Amount: 250.000 \$

Project Sponsors :

- Bedirhan Hazar Hasgöl, Product Designer
- Nebi Kurtuluş , Customer Support Manager
- Onur Sıbıç , Operation Manager
- Berker Şahin , IT Manager
- Kemal Kağan Kural , Marketing Manager
- Alijon Fatoev , Human Resource Manager

Project Description (Business Needs)

The project will provide a platform for small businesses to make advertising and promotions, and will aim to increase operating and advertising costs and revenue.

Business Requirements :

Using our mobile or web application, customers will be able to benefit from the campaigns appropriate for them. The specific functionality that the system should have includes the following:

- Search campaigns
- See the features and score of the relevant store
- Purchase campaign from the application, etc.

Business Value:

We expect the app to be viral by using low-budget people such as students, offering users real and affordable discounts. In this way, as the scope of the application expands, enterprises will want to participate in the application and the company will increase its revenues by conducting all operations in areas such as advertising, membership etc.

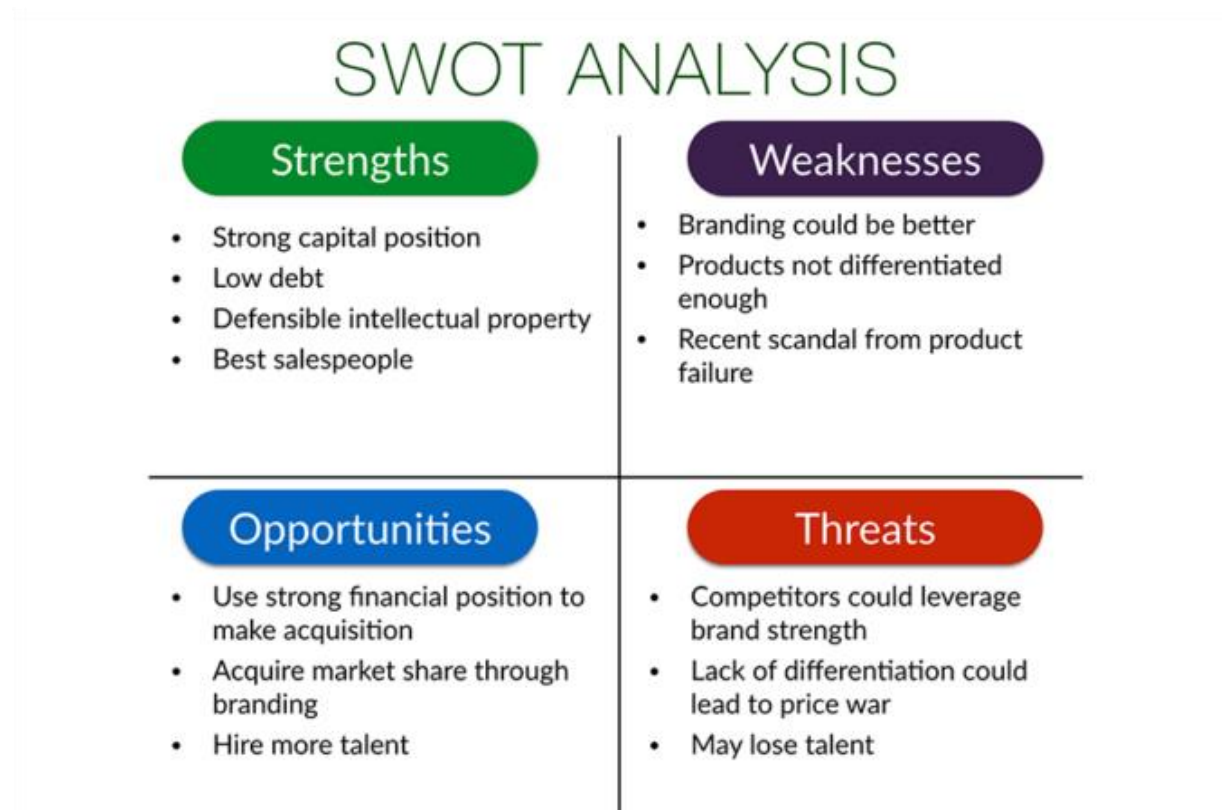
2. Analysis Strategy

2.1 Business Process Management

Processes involving more people to work together. We decided to work with cafe shops, restaurants and cinemas as well by using BPA, in which it can make the project more efficient. BPA projects spend a significant time understanding the current as-is system before moving on to improvements and to-be system requirements. Problem analysis and root cause analysis are two popular BPA. Our goal for using BPA is that, process management tries to reduce the friction in the process to zero. It wants things to happen faster and more efficiently all the time, including identifying opportunities for automation. Data in process management software moves automatically. No one needs to push the data; it just flows on its own. Data on the process can also be gathered and analyzed to determine how well the process is functioning.

	Task Management	Project Management	Process Management
Goal	Productivity	Transparency	Efficiency
Key Features	Easy organization	Flexibility, Quick Actions	Intelligent Design, Integration
Examples	Any.do, Todoist, Wunderlist	Trello, Basecamp, Wrike, Asana	KISSFLOW, Process Street, ProcessBuilder
Built for	Individuals	Teams	Companies
What happens to data	Data is stationary	Data moves manually	Data moves automatically

To get where you want to go, you first need to understand where you are. In our Project we use Strategic analysis tool to map out our current positions before we develop strategic plans for future direction and growth. There are many ways to perform a strategic analysis – but the most common for our Project as well is a SWOT analysis – which considers our project's strengths, weaknesses, opportunities and threats.



The use of SWOT analysis lets us to improve the whole project where better efficiency can be gained. It also mitigates risks associated with the tasks and optimizes the whole process. The team members get to do more with less. Because of the nature of the analysis, it is important to conduct the SWOT analysis during the startup phase. It can provide a solid backbone to our project plan.

2.2 Feasibility Analysis

2.2.1 Executive Summary

This project works for students and other people to get discounts at the stores and businesses where they go. Thanks to the discounts, it enables them to increase the revenue of both stores and businesses. We think it will also encourage people to travel, because when they go out, they will look at the practice and know that they will get a discount and they will spend less on their pockets and spend less on their money. Especially students think we will use more. We think at first practice in some cities in Turkey. Those cities are Istanbul, Ankara, Izmir and Bursa, because those cities have more population than other cities. As we mentioned before, our other target is stores and businesses because we want stores and businesses to make more profits with these discounts and special offers. The number of people coming to stores and businesses in this application will increase thanks to this application. And as the income of those stores and businesses increases, so does our profit.

2.2.2 Market Analysis

- Industry Overview
- Target Market
- Competition
- Pricing and Forecast

Step 1 : Industry Overview

Our application is linked to the consumption industry. Also The consumption sector continues to increase with each passing day. For this reason, we tried to provide the same service by considering the share of the consumer in this increase. We observed that the number of stores and businesses in the cities where our application will be used is more than 1 million. That was one of the factors in our selection of cities.

Step 2:Target Market

Our goal is actually everyone, but our priority is students. Because it is seen that the students go to cafes to socialize. In addition, such applications are more popular among students. For this reason, we think that the students who will make our application popular will be the students.

Step 3:Competiton

Direct competition:We have some competitors in this sector,but they don't make same event,because we use GPS and we give direct discount.Also our application will show you the most suitable stores and businesses for you at that moment.

Indirect competitor: Our indirect competitors are actually hand brochures distributed by stores and businesses, because the brochures show the discounts and allow them to get discounts. In addition, our other indirect competitor is gift vouchers, because gift vouchers allow them to receive discounts.

Step 4:Pricing and Forecast

For pricing we think as follows. We are thinking of getting a share of a certain pioneer in sales of stores and businesses that work with us. In addition, people using the application can pay through our application,so we will take our share while paying the working businesses with us, after that we will pay to the businesses. So we win while they win.

2.2.3 Marketing Strategy

This section provides a high-level description of how the organization will market its product or service. Some topics which should be included are: how does an organization differentiate itself from its competitors; types of marketing the organization will utilize; and who the organization will target. Marketing efforts must be focused on the right target groups in order to yield the greatest return on investment.As a marketing strategy, we think to use social media. Because social media is the biggest advertising space of today. The number now using social media, Turkey's population is approaching in a way. Therefore, when we advertise our application on social media, we think that the

chances of people not seeing it will be very low. We will also work with famous names in social media and encourage you to use our application.

2.2.4 Technology Considerations

The technological aids used in making our application are as follows. Those are Big Data, Java, AI, GPS, Oracle RMS, Big Data Policing, Red Sigma, Cloud Based System, PHP

- **Big Data:** Definitions of Big Data vary considerably, and industry experts have yet to reach a consensus on the topic.¹ However, nearly all definitions refer to an analytical process in which a large number of basic units (data points) are processed to produce a finished product. The purpose of this product is to answer questions, solve problems and tell stories. ‘Big’ data cannot be defined purely in terms of the size of a dataset, but rather the ‘capacity to search, aggregate, and cross- 25 | Page reference large data sets’.² In other words, big data analytics (advanced analytics) becomes necessary when data is collected on such a large scale that it cannot be analyzed with traditional data-management tools and methods.

- **JAVA:** We use java, because application was created with java. Also java is used every platforms that are android, ios, microsoft. Also we wanted our application to be accessible on every platform side.

- **AI (Artificial Intelligence):** A key feature of advanced analytics is the use of algorithms, which increasingly incorporate Artificial Intelligence (AI) methods underpinned by machine learning. As AI entails that the machine processing the data learns new rules through experience, the processing methods and calculations involved are often opaque to a human observer.

- **GPS (Global Positioning System):** GPS navigation systems use big data to provide drivers with real-time traffic information, and even to predict flows of traffic using deep learning methods.

- **Oracle RMS (Relational Database Server):** Create a Solid Merchandising Foundation. Manage, control, and perform seamless execution of day-to-day merchandising activities, including purchasing, distribution, order fulfillment, and financial close.

-**Big Data Policing:** The Rise of Big Data Policing shifts our frame of reference on modern policing from the celebration of aggressive patrol tactics to urgent questions of the role new police technologies in the production of security, the risks to freedom, and the levers of social control in the expanding surveillance state. Andrew Ferguson opens a window to define, categorize, understand, and showcase the transformation and digital deregulation of policing, and its implications for liberty and security. Ferguson teaches us not only the fault lines in how police watch us, but how we can turn the tables to use new algorithms to watch the police. At stake is nothing less than individual liberty and the democratic control of policing.

- **Red Sigma:** A cloud-based platform replacing multiple fragmented software systems, making it quicker and easier for officers to enter information and access data.

- **Cloud Based System:** Durham and Cumbria Constabularies recently adopted a cloud-based platform, Red Sigma, to replace the multiple fragmented software systems previously used to perform routine policing tasks.¹² Stuart Grainger, then head of ICT at Durham Constabulary, explained how the new system has reduced data overlap and duplication, making significant time savings.¹³ Crucially, Durham Constabulary's strategy did not require any formal training for officers, but focused instead on making the technology intuitive and easy to use.

- **PHP:** Hypertext Preprocessor (or simply PHP) is a general-purpose programming language originally designed for web development. It was originally created by Rasmus Lerdorf in 1994; the PHP reference implementation is now produced by The PHP Group. PHP originally stood for Personal Home Page, but it now stands for the recursive initialism PHP: Hypertext Preprocessor.

PHP code may be executed with a command line interface (CLI), embedded into HTML code, or used in combination with various web template systems, web content management systems, and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in a web server or as a Common Gateway Interface (CGI) executable. The web server outputs the results of the interpreted and executed PHP code, which may be any type of data, such as generated HTML code or binary image data. PHP can be used for many programming tasks outside of the web context, such as standalone graphical applications.

3.PROJECT PLANNING

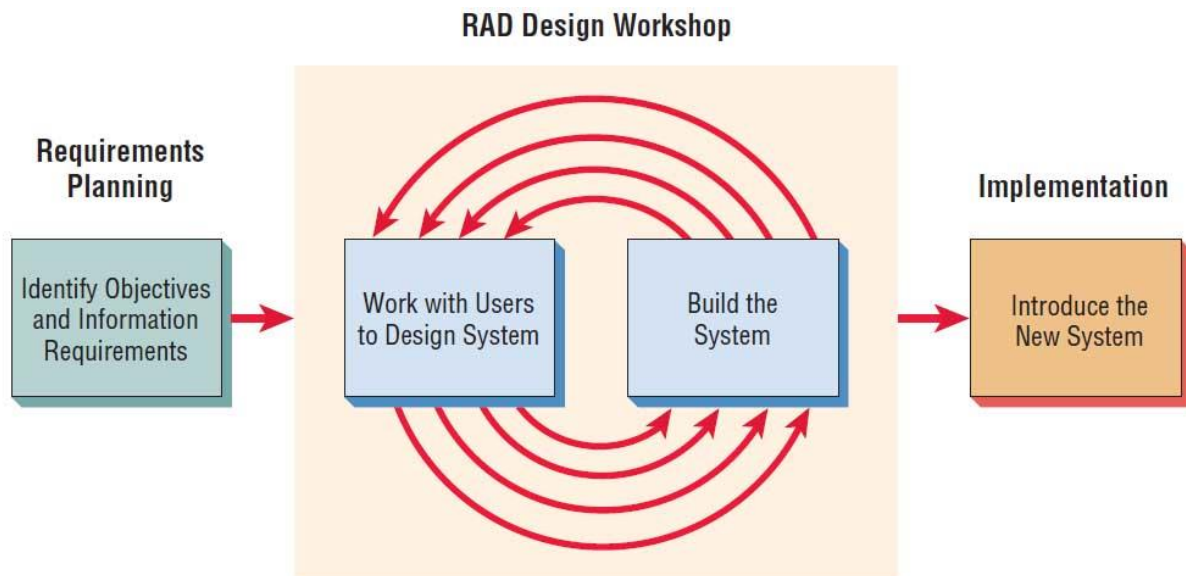
3.1 Project Methodology

3.1.1 System Development Methodology

Identifying the needs of the users in customizing the product for optimal user experience. Using user and users' analysts' feedback, there has been some developments and new features that allows both rear-view & forward analysis of market and can be used to identify missed opportunities in market statistics analysis, track effectiveness, and get the most out of market analysis predictions.

Rapid application development (RAD) is an object-oriented approach to systems development that includes a method of development as well as software tools. Some developers are looking at RAD as a helpful approach in new e-commerce, Web-based environments in which so-called first-mover status of a business might be important. In other words, to deliver an application to the Web before their competitors, businesses may want their development

team to experiment with RAD.



In order to achieve our goals, we should use Rapid Application Development method which is a software development methodology based on the most quick software development method. It helps us to make quick decisions. At the same time, compliance with the principles of the project;

- easy to change,
- increase communication within the team,
- delivery of piece by piece software,
- development of test-oriented software,
- and compatible planning etc.

3.1.2 Principles

- Because of its development, it gives consumer loyalty.
- Changes can be made at every stage of the project.
- Quality software deliveries are made at short intervals.
- All team members interact with each other.

- The team was given face-to-face communication for quality information flow.
- The motivation of the team members was kept high.
- Methodology was given importance to develop as fast as possible, sustainable.
- Strong technical infrastructure and design agility have been increased.
- The principle of simplicity was provided in every stage as much as possible.
- At certain intervals, the team gathered and exchanged ideas about their methods.

3.1.3 Advantages & Disadvantages of the Methodology

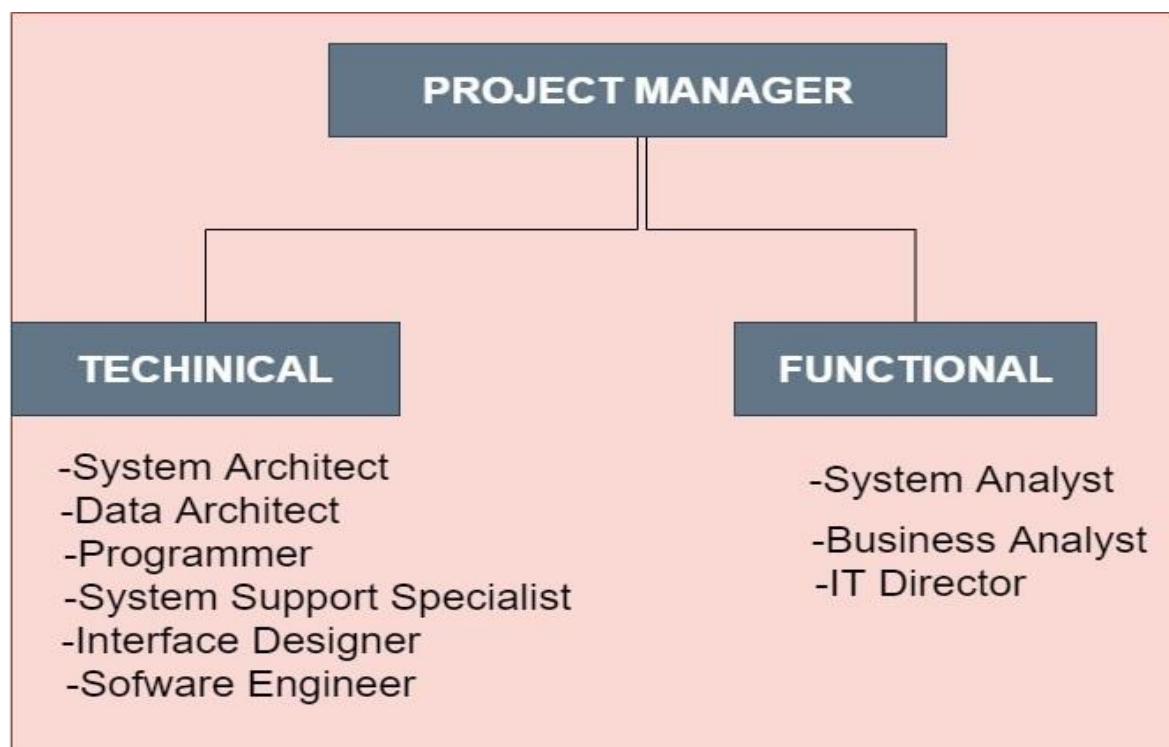
In the positive aspects of RAD model according to the present requirement of the software developer industries includes that RAD model has no detailed pre-planning that makes it easier to incorporate the changes within the development process.

RAD model enables rapid delivery as it reduces the overall development time due to provide functionality to reuse the prototype or components as well as enables the parallel development. RAD projects follow iterative and [incremental](#) model and have small teams comprising of developers, domain experts, customer representatives and other IT resources working progressively on their component or prototype.

On the other hand, the RAD model works well if and only if high skilled engineers and experienced developers and system analyst are available. In this model the customer is also committed to achieve the targeted prototype in the given time frame. If there is commitment lacking on either side the model may fail.

Pros of RAD Model	Cons of RAD Model
Requirements changes can be accommodated.	It is suitable for project requiring shorter development times.
Iteration time can be short with use of powerful RAD tools.	Dependency on technically strong team members for identifying business requirements.
Integration from very beginning solves a lot of integration issues.	Requires user involvement throughout the life cycle.
Productivity with fewer people in short time.	Only system that can be modularized can be built using RAD.
Increases reusability of components	Inapplicable to cheaper projects as cost of modeling and automated code generation is very high.
Progress can be measured.	It is suitable for systems that are component based and scalable.
Encourages customer feedback	Requires highly skilled developers/designers.
Quick initial reviews occur	High dependency on modeling skills.
Reduced development time	Management complexity is more

3.2.1.1. Task Definitions



Project Manager

- Project management is the practice of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria at the specified time.

Functional

- System Analyst: The system analysts carry the responsibilities of researching problems, finding solutions, recommending courses of actions and coordinating with stakeholders in order to meet specified requirements. They study the current system, procedures and business processes of this company and create action plans based on the requirements set.
- Business Analyst: The business analysis is the task of understanding business change needs, assessing the business impact of those changes, capturing, analyzing and documenting requirements and supporting the communication and delivery of requirements with relevant stakeholders.
- IT Director: The IT director is an external staff not related to the project's itself. The IT director will be the go-to person for possible issues on the system and will be the equivalent for project team's System Support Specialist.

Technical

- System Architect: The systems architect is a technology professional who develops and implements computer systems and networks for an organization. He or she defines the architecture of a system in order to fulfill certain requirements. Defining the architecture could mean breaking down the system into components, defining component interactions and interfaces, and/or deciding on the technologies and resources to be used in the design.
- Data Architect: The data architect is an individual who is responsible for designing, creating, deploying and managing an organization's data architecture. Data architects define how the data will be stored, consumed, integrated and managed by different data entities and IT systems, as well as any applications using or processing that data in some way.

- **Programmer:** The programmer creates the code for software applications and operating systems. After a software developer designs a computer program, the programmer writes code that converts that design into a set of instructions a computer can follow. They test the program to look for errors and then rewrite it until it is error-free. The programmer continues to evaluate programs that are in use, making updates and adjustments as needed.
- **System Support Specialist:** The system support specialists are responsible for all aspects of help desk support and technical assistance. They must address a wide variety of user issues, including software problems, hardware failures, and network issues. They are responsible for creating and maintaining user accounts and information.
- **Interface Designer:** The User Interface (UI) design is the process of making interfaces in software or computerized devices with a focus on looks or style. Designers aim to create designs users will find easy to use and pleasurable.
- **Software Engineer:** The software engineers apply the principles and techniques of computer science, engineering, and mathematical analysis to the design, development, testing, and evaluation of the software and the systems that enable computers to perform their many applications.

3.2.1.2. Task Identification

TASK ID	#1
NAME OF THE TASK	PRELIMINARY RESEARCH
START DATE	07.12.2019
COMPLETION DATE	07.01.2020
PERSON ASSIGNED TO TASK	Business Analyst
DELIVERABLES	Related Documents
PRIORITY	High
RESOURCES NEEDED	Sources

TASK ID	#2
Name of the Task	Resource Gathering
START DATE	29.12.2019
COMPLETION DATE	29.01.2020
PERSON ASSIGNED TO TASK	Business Analyst
DELIVERABLES	Data
PRIORITY	Medium
RESOURCES NEEDED	Sources

TASK ID	#3
NAME OF THE TASK	System Request Form
START DATE	11.01.2020
COMPLETION DATE	05.02.2020
PERSON ASSIGNED TO TASK	Business Analyst
DELIVERABLES	Request Form
PRIORITY	High
RESOURCES NEEDED	Business Needs

TASK ID	#4
NAME OF THE TASK	Analysis Strategy
START DATE	25.01.2020
COMPLETION DATE	25.02.2020
PERSON ASSIGNED TO TASK	Project Manager
DELIVERABLES	Decisions
PRIORITY	High
RESOURCES NEEDED	Computer System Documentation

TASK ID	#5
NAME OF THE TASK	Project Planning
START DATE	13.02.2020
COMPLETION DATE	07.03.2020
PERSON ASSIGNED TO TASK	Project Manager
DELIVERABLES	Project Plan
PRIORITY	Very High
RESOURCES NEEDED	Sources

TASK ID	#6
NAME OF THE TASK	Requirements Definition Forms
START DATE	16.01.2020
COMPLETION DATE	08.02.2020
PERSON ASSIGNED TO TASK	System Analyst
DELIVERABLES	System Requirement Documents
PRIORITY	Medium
RESOURCES NEEDED	-

TASK ID	#7
NAME OF THE TASK	Use Cases
START DATE	25.01.2020
COMPLETION DATE	25.02.2020
PERSON ASSIGNED TO TASK	System Analyst
DELIVERABLES	Process Model
PRIORITY	High
RESOURCES NEEDED	Functional Requirements

TASK ID	#8
NAME OF THE TASK	Context Diagram
START DATE	25.01.2020
COMPLETION DATE	13.02.2020
PERSON ASSIGNED TO TASK	Data Architect
DELIVERABLES	Process Scheme
PRIORITY	Medium
RESOURCES NEEDED	Use Case

TASK ID	#9
NAME OF THE TASK	Level 1 DFD
START DATE	20.01.2020
COMPLETION DATE	11.02.2020
PERSON ASSIGNED TO TASK	Data Architect
DELIVERABLES	Level 1 Data Flow Diagram
PRIORITY	High
RESOURCES NEEDED	Context Diagram

TASK ID	#10
NAME OF THE TASK	ER Data Model and Relationships
START DATE	25.01.2020
COMPLETION DATE	25.03.2020
PERSON ASSIGNED TO TASK	Data Architect
DELIVERABLES	Representation Model
PRIORITY	High
RESOURCES NEEDED	Use Case

TASK ID	#11
NAME OF THE TASK	Database Models
START DATE	25.01.2020
COMPLETION DATE	30.03.2020
PERSON ASSIGNED TO TASK	Data Architect
DELIVERABLES	ER Data Model
PRIORITY	High
RESOURCES NEEDED	ER Data Model

TASK ID	#12
NAME OF THE TASK	Architecture Design
START DATE	25.01.2020
COMPLETION DATE	25.07.2020
PERSON ASSIGNED TO TASK	Programmer
DELIVERABLES	Conceptual Model
PRIORITY	Medium
RESOURCES NEEDED	Software and Network Capabilities

TASK ID	#13
NAME OF THE TASK	Software and Hardware Specifications
START DATE	25.01.2020
COMPLETION DATE	12.02.2020
PERSON ASSIGNED TO TASK	System Architect
DELIVERABLES	System Structure
PRIORITY	Low
RESOURCES NEEDED	Architecture Design Specifications

TASK ID	#14
NAME OF THE TASK	User Interfaces Design
START DATE	25.01.2020
COMPLETION DATE	30.04.2020
PERSON ASSIGNED TO TASK	Programmer
DELIVERABLES	Coding Knowledge
PRIORITY	High
RESOURCES NEEDED	Programming Language

TASK ID	#15
NAME OF THE TASK	System Structure Chart & Module Specifications
START DATE	25.01.2020
COMPLETION DATE	11.02.2020
PERSON ASSIGNED TO TASK	Software Engineer
DELIVERABLES	System Structure Chart
PRIORITY	High
RESOURCES NEEDED	User & Functional Requirements

TASK ID	#16
NAME OF THE TASK	System Implementation
START DATE	25.07.2020
COMPLETION DATE	30.10.2020
PERSON ASSIGNED TO TASK	Project Manager
DELIVERABLES	Working System
PRIORITY	High
RESOURCES NEEDED	Computer

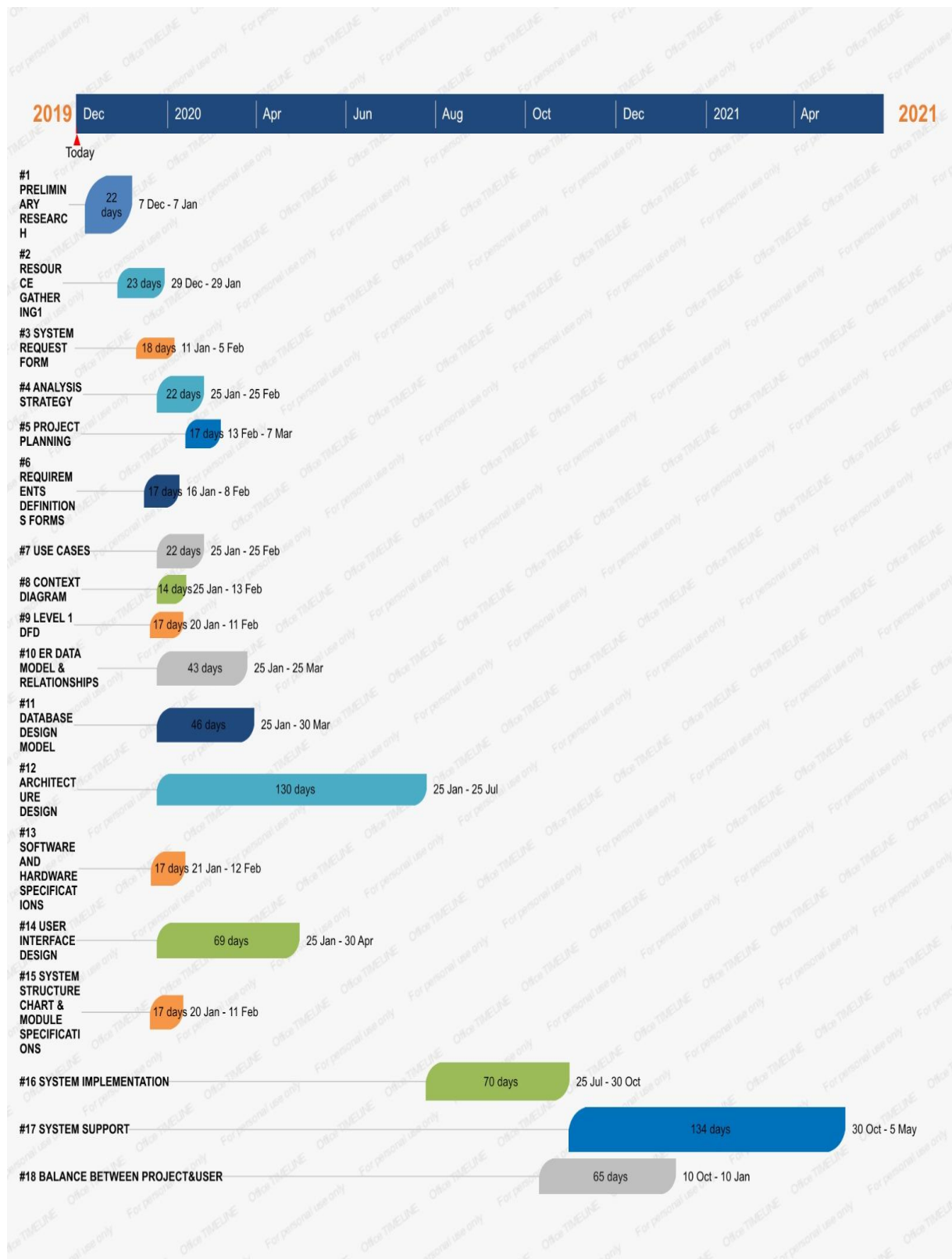
TASK ID	#17
NAME OF THE TASK	System Support
START DATE	30.10.2020
COMPLETION DATE	-
PERSON ASSIGNED TO TASK	System Support Specialist
DELIVERABLES	Keep the System Running and Updated
PRIORITY	-
RESOURCES NEEDED	Support Tools

TASK ID	#18
NAME OF THE TASK	Balance Between Project & User
START DATE	10.01.2021
COMPLETION DATE	-
PERSON ASSIGNED TO TASK	IT Director
DELIVERABLES	Data Readable by the System
PRIORITY	Medium
RESOURCES NEEDED	Sources

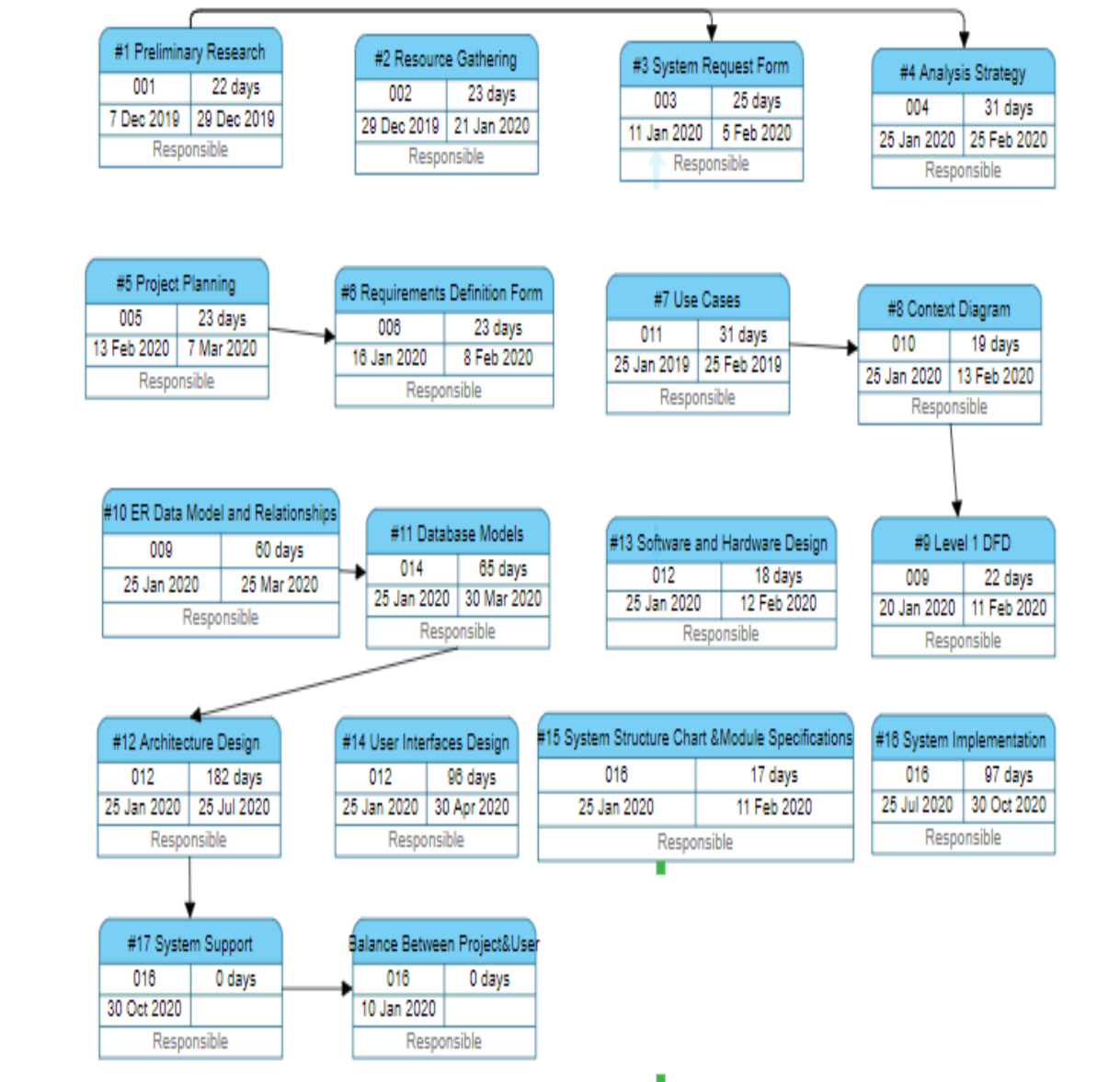
3.2.1.3 Work Breakdown Structure

WORK BREAKDOWN STRUCTURE				
TASK ID	TASK NAME	PERSON ASSIGNED TO THE TASK	DURATION (DAYS)	DEPENDENCY
#1	PRELIMINARY RESEARCH	Business Analyst	30	
#2	RESOURCE GATHERING	Business Analyst	30	
#3	SYSTEM REQUEST FORM	Business Analyst	25	#1
#4	ANALYSIS STRATEGY	Project Manager	30	#1
#5	PROJECT PLANNING	Project Manager	22	
#6	REQUIREMENTS DEFINITIONS FORMS	System Analyst	23	#5
#7	USE CASES	System Analyst	30	
#8	CONTEXT DIAGRAM	Data Architect	18	#7
#9	LEVEL 1 DFD	Data Architect	21	#8
#10	ER DATA MODEL & RELATIONSHIPS	Data Architect	60	
#11	DATABASE MODELS	Data Architect	65	#10
#12	ARCHITECTURE DESIGN	Programmer	180	#11
#13	SOFTWARE AND HARDWARE SPECIFICATIONS	System Architect	18	
#14	USER INTERFACES DESIGN	Programmer	95	
#16	SYSTEM STRUCTURE CHART & MODULE SPECIFICATIONS	Software Engineer	16	
#17	SYSTEM IMPLEMENTATION	Project Manager	95	#12
#18	SYSTEM SUPPORT	System Support Specialist	-	#17

3.2.1.4 Gantt Chart



3.2.1.5 PERT Chart



3.3 Budget Assessments

DATE	ITEM / TASK DESCRIPTION	BEST-CASE	MOST LIKELY / REALISTIC	WORST- CASE	WEIGHTED AVERAGE
07-Dec-19	#1 PRELIMINARY RESEARCH	\$1000	\$1200	\$1500	\$1250
29-Dec-19	#2 RESOURCE GATHERING1	\$2000	\$2200	\$2500	\$2150
11-Jan-20	#3 SYSTEM REQUEST FORM	\$500	\$650	\$700	\$625
25-Jan-20	#4 ANALYSIS STRATEGY	\$5000	\$6000	\$6450	\$5780
13-Feb-20	#5 PROJECT PLANNING	\$35000	\$45000	\$50000	\$42500
16-Jan-20	#6 REQUIREMENTS DEFINITIONS FORMS	\$4500	\$5200	\$5950	\$4750
25-Jan-20	#7 USE CASES	\$22000	\$24500	\$27000	\$24250
25-Jan-20	#8 CONTEXT DIAGRAM	\$3150	\$3200	\$3500	\$3295
20-Jan-20	#9 LEVEL 1 DFD	\$4250	\$4300	\$4950	\$4390
25-Jan-20	#10 ER DATA MODEL & RELATIONSHIPS	\$4300	\$4350	\$5000	\$4450
25-Jan-20	#11 DATABASE DESIGN MODEL	\$4500	\$4600	\$4750	\$4650
25-Jan-20	#12 ARCHITECTURE DESIGN	\$7150	\$7300	\$7500	\$7275
21-Jan-20	#13 SOFTWARE AND HARDWARE SPECIFICATIONS	\$5150	\$5200	\$5300	\$5240
25-Jan-20	#14 USER INTERFACE DESIGN	\$32500	\$35000	\$39000	\$36000
20-Jan-20	#15 SYSTEM STRUCTURE CHART & MODULE SPECIFICATIONS	\$24000	\$26000	\$29000	\$26000
25-Jul-20	#16 SYSTEM IMPLEMENTATION	\$46000	\$51000	\$54000	\$51000
30-Oct-20	#17 SYSTEM SUPPORT	\$-	\$ -	\$-	\$-
	TOTAL	\$198800	\$223250	\$237100	\$223605

3.4 Risk Assessment

3.4.1 Risk Identification

- 1. **Cost risks:** typically, escalation of project costs due to poor cost estimating accuracy and scope creep.
- 2. **Schedule risks:** the risk that activities will take longer than expected. Slippages in schedule typically increase costs and, also, delay the receipt of project benefits, with a possible loss of competitive advantage.
- 3. **Performance risks:** the risk that the project will fail to produce results consistent with project specifications.
- 4. **Governance risks:** relates to board and management performance regarding ethics community stewardship, and company reputation.
- 5. **Strategic risks:** result from errors in strategy, such as choosing a technology that can't be made to work.
- 6. **Operational risks:** includes risks from poor implementation and process problems such as procurement, production, and distribution.
- 7. **Market risks:** include competition, foreign exchange, commodity markets, and interest rate risk, as well as liquidity and credit risks.
- 8. **Legal risks:** arise from legal and regulatory obligations, including contract risks and litigation brought against the organization.
- 9. **Risks associated with external hazards:** including storms, floods, and earthquakes; vandalism, sabotage, and terrorism; labor strikes; and civil unrest.

3.4.2. Risk Management

1. Since some of the activities in the project lasted longer than expected, there has been a timing issue, so it was necessary to accelerate other activities. In this way, the project was completed with the result of a short delay.
2. Weekly regular evaluation meetings were held against the risk of the project going beyond the determined scope of the project. At every stage, project team were at communication with the customer, and when necessary, rapid arrangements and returns were made.
3. In terms of the required budget and resources, the board has done its best to make the project progress faster and healthier.
4. Since the system is a first in the market, competition is beside the mark. However, due to fast developing technology, its competitors are expected to arise in the market soon. Therefore, a system that is high-quality and open new technological developments has been built.
5. Every stage of the project was made in accordance with the rules of law and importance was given to the creation of necessary permits and documents. Especially because the system will be used by law enforcement officers and because it contains of the criminal and offence information, high security and legal law measures have been taken. At the same time, necessary security measures were taken in for the possible cyber-attack situations.

3.4.3. Other Risk Factors

1. There is an issue with the system's decision mechanism. System tends to be biased and racist in proportion with the users' bias and racism. This problem currently has no tactile solution.
2. 2. The system may not be comprehensible and the new employee who will replace the employee may not understand the system's working mechanisms. With the proper, well-designed documentations and change-logs these can be avoided.

4) REQUIREMENTS DEFINITION FORM

4.1 User, Functional & Non-Functional Requirements

User Requirements

- System should provide location and the current promotions.
- Users should turn on their locations in order to see closer promotions to them.
- Users should be able to interact with the application to add possible promotions.
- System should be user friendly so that everybody can use the system without getting into complex details.
- System should track the promotions to not give any false information.
- Businesses will have business account which can act as a intranet and modify their business page and promote their offers.

Functional Requirements

- Users can register the system.
- Users can login or log out the system.
- Users can search a place such as a restaurant, theatre or etc..
- Users can comment a place.
- Users can like or dislike a place.
- Users can review a place.
- Users can add a place.
- Users can add pictures to added places.
- System should separate the offers depending on the distance.
- User can look for any offers in the application or turn on their location to see which one is the nearest.
- Offers should be accurate and up to date to don't have any misinformation.
- System should arrange time-location well to provide the offers if that offer is available for each week for certain times.
- System should track which offer is the most popular to select best offer of the week.
- Program should support at least 10.000 people's use concurrently.

Non-Functional

- System should be easy to use for everybody.
- System will work on iOS 12, Android Lollipop and Web.
- System should update the offers when new promotions are added.
- Accessible for everybody so it's free to use.
- System should be available 24/7 and 365 days.
- System should convert currencies for foreign users.

4.2. Detailed System Requirements

4.2.1 Major System Capabilities

- System must be accessible by all mobile devices.
- System must be available 7/24 to users.
- System must available on the Internet.
- System sends alert message in case of lost connection.
- System should provide a secure connection.
- System provides reports (which offer is most used, which location is most preferred.)
- System provides administrators to add, delete and edit the offers available.
- System uses data encryption.
- System uses DRM.
- Modify user operation, the UI shows the user any modifications performed on the user's profile
- Operation add new user, if user is already registered, the system shows message that the user is already registered and should contact the administrator

- System send notifications to the users for specific fields of interest
- System allows contact the user with administrator
- Generate an advice to the user depending on users past locations and trends on where to go.
- System detects regions and analyzed regions
- System will artificially make suggestions depending on the data it collected.
- System will store it's data to be able to use those data afterwards.

4.2.2. Major System Conditions

- System must use Enterprise GIS Framework
- System must use Enterprise Document Management System
- System must use GPS (Global Positioning System).
- Measures must be taken for any kind of new offers.
- All roles and tasks must be clearly stated.
- A feedback system should be created for each step.
- A performance management system should be created for each step.
- Process design should be determined.
- And others; management information, performance management systems, structure, information technology, management behavior, regulation, inspection and so on.

4.2.3 System Interfaces

AI (Artificial Intelligence) : AI will analyze the data that are being held and make insights from the data that are used. It could give advice to the users to a certain location based on their habits, and also it can advice to the business owners to arrange their pricing policy and offer times depending on when the customers visit the most.

GPS (Global Positioning System) : A GPS navigation system is a GPS receiver and audio/video (AV) components designed for a specific purpose such as a car-based or hand-held device or a smartphone app. The global positioning system (GPS) is a 24-satellite navigation system that uses multiple satellite signals to find a receiver's position on earth.

Forms Based Interfaces

A forms-based interface displays a form to each user. Users can fill out all of the form entries to insert a new data, or they can fill out only certain entries, in which case the DBMS(Database Management System) will redeem same type of data for other remaining entries. This type of forms are usually designed or created and programmed for the users that have no expertise in operating system. Many DBMSs have forms specification languages which are special languages that help specify such forms.

Menu-Based Interfaces for Web Clients or Browsing

These interfaces present the user with lists of options (called menus) that lead the user through the formation of a request. Basic advantage of using menus is that they removes the tension of remembering specific commands and syntax of any query language, rather than query is basically composed step by step by collecting or picking options from a menu that is basically shown by the system. Pull-down menus are a very popular technique in Web based interfaces. They are also often used in browsing interface which allow a user to look through the contents of a database in an exploratory and unstructured manner.

Graphical User Interface –

A GUI typically displays a schema to the user in diagrammatic form. The user then can specify a query by manipulating the diagram. In many cases, GUI's utilize both menus and forms. Most GUIs use a pointing device such as mouse, to pick certain part of the displayed schema diagram.

4.3. Policy and Regulation Requirements

4.3.1. Policy Requirements

Although there are regional structures and partnerships in place, the wide variation in the level of technological development makes it difficult for forces to collaborate when designing new technology. It is imperative that national policies and strategies are developed to create coherence between forces seeking to implement new technologies.

4.3.1. Regulation Requirements

- The system will limit access to authorized users.
- The system will extract data from other databases.
- The system will have a relational database.

4.4. Security Requirements

- Protection of systems from unauthorized access
- Managing physical access to the system center
- Restriction of access to systems via computer networks
- System administrator and operator assignment procedure
- Managing user IDs of authorized personnel and secure logon procedure
- Record management and separation of tasks
- Operating procedures, roles and responsibilities
- Management of system maintenance
- Managing security of application software
- Backup system center, procedures and tests
- Information Systems Security Manager and Personnel Employment
- Documentation

4.5. Requirements Elicitation Techniques

We have used 3 requirements elicitation techniques. First of all, we asked students who are one of our target audiences by asking them some questions about this system. We gathered information about the features of the system and outlined our system.

In the second phase, JAD session were conducted with staffs , as well as five experts from the technology sector and academia. All were conducted on a confidential basis, allowing respondents to speak openly about sensitive or contentious issues.

For the third stage of our research, we have gathered the requirements by observing the operational processes of our competitors currently in the market.

5.Use Cases

5.1 User Perspective

Use Case Name:	Sign Up	ID:	UC - 1	Priority:	HIGH
Actors:	User				
Description:	User may create an account using the application				
Trigger:	Click on Sign up Button	Type:			External
Preconditions:	<ol style="list-style-type: none">1.The users has application or web url2. The users has E-mail3. The users has phone number				
Normal Course:	<ol style="list-style-type: none">1.The user open application2.User fill the related fields with personal information and set password3. Users enter valid e-mail and phone number.4. Users click on sign up button.5.System send verification mail6. Users verify their accounts				
Alternative Course:	<ol style="list-style-type: none">1.Users may create account with using their social media accounts such as Facebook and Google				
Postconditions:	<ol style="list-style-type: none">1.Users have verified account2.Users has access to log in system				
Exceptions:	<p>E1. Users may not have an E-mail or phone number.</p> <ol style="list-style-type: none">1. System allows the users sign up with one of them <p>E2. Verification mail may not reach to users.</p> <ol style="list-style-type: none">1. Users may ask verification mail again.				

Use Case Name:	Login to the system	ID:	UC - 2	Priority:	HIGH
Actors:	User				
Description:	Users may log into the system with using a verified account.				
Trigger:	Click on Login icon	Type:		External	
Preconditions:	1.Users have verified account 2.Users has access to log in system				
Normal Course:	1.Users fill related fields such as e-mail or phone number 2.Users enter password 3.Users click on login button 4. System send a request and take respond from database and check the users information 5.System allows the users log in to the system.				
Alternative Course:	1. Users may use already logged account or open and valid social media accounts. 2. System send a request and take respond from database and check the users information 5.System allows the users log in to the system.				
Postconditions:	1.Users logged into the system successfully				
Exceptions:	E1. Users may not have verified account. 1.System displays a error message. E2. Users may enter their data and password wrongly 1.System will displays a message saying that “Invalid accounts credentials”				

Use Case Name:	Login to the system	ID:	UC - 3	Priority:	HIGH
Actors:	User				
Description:	Users may forget their password so they can change their password with using this feature.				
Trigger:	Click on Forget Password button	Type:			External
Preconditions:	1.The users have account 2. The users forgot their password.				
Normal Course:	1.Users click on forget password icon 2.Application ask from users to fill e-mail or phone number 3.System send a resetting password steps to users. 4.Users follow these steps and reset their password.				
Alternative Course:	N/A				
Postconditions:	1.The users have new password. 2. The users have access to log into system.				
Exceptions:	E1. Users can not reach resetting password steps. 1. Users may asks steps again with using “send again” button.				

Use Case Name:	Search	ID:	UC - 4	Priority:	HIGH
Actors:	User				
Description:	Users search related offers and they can choose a offers according to their needs				
Trigger:	Click on Search buttpn	Type:		External	
Preconditions:	1.Users have verified account 2.Users has access to log in system				
Normal Course:	1.Users logged into search page 2. Users can filter the search by location, type, time etc. 3.System displays the related and filtered results to users 4. Users can choose a offer.				
Alternative Course:	1.Fast search results displayed by system to users related to users historical behaviors or chooses. 2.Users choose an offer from fast search results				
Postconditions:	1.Users attend a offer.				
Exceptions:	E1. Filtered searches may not have results. 1.System displays a no result message. 2.System displays other related offers related to users.				

Use Case Name:	Search Assistant	ID:	UC - 5	Priority:	HIGH
Actors:	User				
Description:	User may use virtual search assistant by talking to application				
Trigger:	Click on Voice search button	Type:		External	
Preconditions:	1.Users have verified account 2.Users has access to log in system				
Normal Course:	1.Users click on voice search icon. 2. Search assistant open and make a sound in order to user understand the assistant is available 3. Users talk to application about their needs 4. Search assistant analyze the users voice and filtered related results. 5.Search assistant will display the related results				
Alternative Course:	N/A				
Postconditions:	1.Users attend a offer.				
Exceptions:	E1. Due to technical problems search assistant may not analyze the users voice. 1. Search assistant says a message about voice problem. 2. Search assitant adress the users to normal search page				

Use Case Name:	Selecting offers	ID:	UC - 6	Priority:	HIGH
Actors:	User				
Description:	Users may select and attend a offer from search results.				
Trigger:	Click on Attend	Type:		External	
Preconditions:	1.Users has access to log in system 2.Users must made a search				
Normal Course:	1.Users see listed results. 2.Users choose and click on one offer 3. Users see offer details 4.Users click on Attend icon 5.System send related information to both database and facility.				
Alternative Course:	N/A				
Postconditions:	1.Users attended a offer successfully				
Exceptions:	E1. While users are trying to attend a offer , offer time may out of expiry. 1.System displays a warning message				

Use Case Name:	QR Code	ID:	UC - 7	Priority:	HIGH
Actors:	User				
Description:	After the users have attended to offer they will take QR code				
Trigger:	Click on QR button	Type:	Temporal	External	
Preconditions:	1.Users attended a offer successfully				
Normal Course:	1.Users click on QR button. 2.System creates a QR code for users related to offers.				
Alternative Course:	1.Users may attend a offer without using QR code				
Postconditions:	1. The users bonus gained from offers will upload to users account.				
Exceptions:	E1. System may not create a QR code successfully 1. System will try to create a QR code until it succeed. 2. System will send a notification to users about QR code				

Use Case Name:	Feedback	ID:	UC - 8	Priority:	MEDIUM
Actors:	User				
Description:	User may give feedback after they attend a offer about offer, facility etc.				
Trigger:	Attending a offer	Type:		External	
Preconditions:	1.Users must attend a offer				
Normal Course:	1.System sends a notification about feedback 2.Users go into feedback page. 3. Users make a comment 4. Users upload a photo from facility 5. Users give a star between 1-5 to offer 6. System upload bonus to user’s account				
Alternative Course:	1. Users do not anything.				
Postconditions:	1.Users gained bonus from offer in order to use these bonus to another offers.				
Exceptions:	N/A				

Use Case Name:	Customer Ranking	ID:	UC - 9	Priority:	HIGH
Actors:	Users				
Description:	In application, while users are using the system they will gain bonus and rank from offers and they can earn additional bonus for offers.				
Trigger:	Using the system	Type:		Temporal	
Preconditions:	1.Users must used the system				
Normal Course:	1.System analyze and count the users attendance. 2. System list the top ten users 3.System will display top ten users 4. System will upload extra bonus to top ten users. 5. System send notification to users about bonus				
Alternative Course:	N/A				
Postconditions:	1.Users gained extra bonus				
Exceptions:	N/A				

Use Case Name:	Settings	ID:	UC - 10	Priority:	LOW
Actors:	Users				
Description:	Users may change application settings				
Trigger:	Click on settings	Type:		External	
Preconditions:	1.Users logged into the system.				
Normal Course:	1.Users Click on setting button 2.Users change the related settings such as notifications 3. Settings updated by the system				
Alternative Course:	1. Users do not anything 2. System Synchronized the settings to users phone automatically				
Postconditions:	1.System updated new settings for users				
Exceptions:	E1. Users phone may crashed with new settings. 1.System directly synchronized the settings in order to run application.				

5.2 Cooperation Perspective

Use Case Name:	Facility Owners Login	ID:	UC - 11	Priority:	MEDIUM
Actors:	Facility Owners				
Description:	Facility Owners will login to the system.				
Trigger:	Facility Owners' Login Icon	Type:	Temporal	External	
Preconditions:	<ol style="list-style-type: none"> 1. Facility Owners should have account. 2. Facility Owners should have Tax ID Number 				
Normal Course:	<ol style="list-style-type: none"> 1. Facility Owners download the application or access the internet URL. 2. Facility Owners should enter their ID or Tax ID number and password to the login interface. 3. Facility Owners can use the system when they logged in. 				
Alternative Course:	<ol style="list-style-type: none"> 1. Facility Owners can also login with their specified phone number. 				
Postconditions:	<ol style="list-style-type: none"> 1. Facility Owners will use their account. 				
Exceptions:	E1 Facility Owners may enter their informations wrong to the system. <ol style="list-style-type: none"> 1. System displays a message that saying "Access Denied." 2. Facility Owners can try to login the system after a waiting period. 				

Use Case Name:	Facility Owners Forget Password	ID:	UC - 12	Priority:	HIGH
Actors:	Facility Owners				
Description:	Facility Owners can not access their account due to forgotten password				
Trigger:	Forgetting Password	Type:	Temporal	External	
Preconditions:	<ol style="list-style-type: none"> 1. Facility Owners may have forgotten their password. 2. Facility Owners should know their ID or tax ID number. 				
Normal Course:	<ol style="list-style-type: none"> 1. Facility Owners open the application or access the internet URL. 2. Facility Owners should click "I forgot my password." link. 3. System will send a form that it will fill by Facility Owners 4. Facility Owners fill the form and send to the Customer Support Department. 5. System will analyze the problem and will take communication with users to solve the problem. 				
Alternative Course:	<ol style="list-style-type: none"> 1 The system can also send a employee to solve the problem in complicated scenarios. 				
Postconditions:	<ol style="list-style-type: none"> 2. Facility Owners' problem will be solved. 				
Exceptions:	N/A				

Use Case Name:	Add/Update/Delete Offers	ID:	UC - 13	Priority:	HIGH
Actors:	Facility Owner Users				
Description:	Facility owners will add, delete, update the offers in the application.				
Trigger:	Editing offers section	Type:	Temporal	External	
Preconditions:	1.Facility owners have to have an account. 2.Analyzing the data's to make an edit.				
Normal Course:	1. Facility owner will open up editing offers section. 2. Owner will add a new offer. 3. Owner will update an existing offer. 4. Owner will delete an offer. 5. The final outcome will be displayed.				
Alternative Course:	1.User can participate for the offers by sending a request.				
Postconditions:	1.The finalized offers will be displayed in the app.				
Exceptions:	E.1 : The offer will not be finalized if the prices are not appropriate. 1. System will deny the offer. 2. System will display a message saying to change the offer. 3. Offer will be fixed.				

Use Case Name:	Measuring the Occupancy Rate	ID:	UC - 14	Priority:	Medium
Actors:	System and Facility Owner				
Description:	The system will analyze the data put in from facility owner and calculate the occupancy rate.				
Trigger:	Data entry	Type:	Temporal	External	
Preconditions:	<ol style="list-style-type: none"> 1. Facility owner will open data entry page. 2. Facility owner will enter the data. 				
Normal Course:	<ol style="list-style-type: none"> 1. Data will be analyzed by the system. 2. The occupancy rate will be calculated by mathematical equations and the result will be shown. 3. System will display the occupancy rate at every facilities page. 4. Users will be able to see these rate and decide which facility is most appropriate for them. 				
Alternative Course:	N/A				
Postconditions:	1.The occupancy rates of each facility is shown in the application.				
Exceptions:	<p>E.1 : Data is entered wrongly</p> <p>The results will be wrong.</p> <p>Facility owner will have to change it manually.</p> <p>System cannot detect this error.</p>				

Use Case Name:	Customer Notifications	ID:	UC - 15	Priority:	HIGH
Actors:	Customer Notification Page				
Description:	System will display the customer info when the customer has already attend to offers.				
Trigger:	Customer take QR code	Type:	Temporal	External	
Preconditions:	1.Customer must logged into system. 2.Customer must attend a offer 3.Facility must logged into system.				
Normal Course:	1.Customer take QR code. 2.Customer information will shown to facilities which customer is attend that facility's offer.				
Alternative Course:	1. Customer may attend offer without QR code. 2. System will not display the customers information to facility.				
Postconditions:	1.Facility will be informed about customers.				
Exceptions:	E1. There might be lack of information about customers. 1. System fill empty fields with N/A E2. Customer attend offer without QR 1.System will send code by SMS				

Use Case Name:	QR Code Reader	ID:	UC - 16	Priority:	HIGH
Actors:	Facility owner users				
Description:	The facility must read the QR code in order to make offer true and also upload the customers bonus				
Trigger:	Taking QR Code	Type:		External	
Preconditions:	1.Facility will be informed about customers.				
Normal Course:	1. User shows the QR code to facility. 2.Facility Users Click on QR code button 3. Facility Users Read the QR code 4. System send the related informations to related database.				
Alternative Course:	1.User attend without QR code 2.User will use SMS code instead of QR 3.Facility use that code to send informations.				
Postconditions:	1.Users bonus will be updated.				
Exceptions:	E.1 Device camera may not work. 1.Customer may take sms code with using related button				

5.3 System Perspective

Use Case Name:	Store the Customer Information	ID:	UC - 17	Priority:	HIGH
Actors:	System and User				
Description:	The system will store the customer information in systems databases.				
Trigger:	Adding new customers	Type:	Temporal	External	
Preconditions:	1.User has to create an account. 2.System has to hold the information.				
Normal Course:	1. The user will create an account. 2. Account information will be held in system databases. 3. Customer Information could be reached by the system to see customer information. 4. System will use these information to validate whenever a user tries to sign in.				
Alternative Course:	N/A				
Postconditions:	1.Database will hold customer information to use it to validate.				
Exceptions:	E.1 Data Loss 1. Data will be lost by technical problems. 2. Customers information will be deleted by the system. 3. Customer will have to create a new account once the system is fixed.				

Use Case Name:	Store the Facility Information	ID:	UC - 18	Priority:	HIGH
Actors:	Facility Owners and System				
Description:	System will store facility information.				
Trigger:	Adding New Facilities	Type:	Temporal	External	
Preconditions:	1. Facility need to create an account. 2. System has to hold information.				
Normal Course:	1. Facility will create an account. 2. Account information will be held in the databases. 3. Information about the occupancy rate, most sold item, most used offer will be analyzed from the database. 4. System will use this information to allow Facility owners to sign in.				
Alternative Course:	N/A				
Postconditions:	1.Facilities information will be held in the database.				
Exceptions:	E.1 Data loss 1. Data will be lost by a technical problem. 2. Facility information will be deleted from the database. 3. Facility Owner will contact administrators to re-create the account.				

Use Case Name:	Process Data	ID:	UC - 19	Priority:	HIGH
Actors:	Team of Data Scientists and Managers.				
Description:	Occurs when data is collected and translated into usable information. Usually performed by a data scientist or team of data scientists, it is important for data processing to be done correctly as not to negatively affect the predictions.				
Trigger:	User Feedbacks	Type:	Temporal	External	
Preconditions:	1. All the data and informations should be stored.				
Normal Course:	1. Data and informations gathers from the databases. 2. Data Analysts analyze the datas. 3. Some bugs and problems will be solved by the data analysts. 4. Database will be updated.				
Alternative Course:	N/A				
Postconditions:	1. Output and interpretation is the stage where processed information is now transmitted to the user. 2. Data, instruction and informations will be reusable in the future				
Exceptions:	E1 Misleading result. 1. Analyzing data that has not been carefully screened for problems can produce highly misleading results that are heavily dependent on the quality of data prepared.				

Use Case Name:	Offer Inspection	ID:	UC - 20	Priority:	HIGH
Actors:	System				
Description:	The system will observe the offers and deny the ones that are not appropriate.				
Trigger:	Creating an offer	Type:	Temporal		External
Preconditions:	1.Offers have to be displayed in the application.				
Normal Course:	1. System will observe the offers. 2. System will make a price range based on the products. 3. System will detect the offers that are not in this range. 4. System will send a warning message to the facility. 5. If the facility does not update the offer, the offer will be deleted by the system.				
Alternative Course:	1. Users will make a complaint about an offer. 2. The system will manually evaluate the offer. 3. The decision will be given by the administrator.				
Postconditions:	1.The offers will be listed properly.				
Exceptions:	N/A				