1. Introduction

1.1 Problem
I have already built a website for a restaurant called "British Dining". It allows customers to order online, and my plan for the future is to develop the same website for hundreds of other restaurants around the UK.
The restaurants have no means of marketing and distributing their food advertisement in a technological way. TV adverts and spreading leaflets fliers are very costly, and plus specific customers can't be targeted this way.

1.2 The Project Goals
My agreed project is based on creating a smart system that uses social media ID (#TwitterID) of every single user that has made an order to the restaurant, to advertise to them the relevant types of food that they might like, based on analysing their social network activities. This smart system will enable the restaurants to target specific customers for specific food advertisements and marketing, using social networks. Building a system like this is hugely relies on accessing social media libraries in order to fetch users posts and tweets. Therefore the problem of privacy may get in the way, however it will be dealt with in the users agreement.

1.3 Scope
The user of this system will be the restaurant and its consumers. This project is only focused on the marketing system of the restaurants businesses. Therefore it includes advertising through social media, launching social media campaigns, and to grow the marketing network. The scope of this project does **not** cover online ordering facility, or building website for the restaurants and takeaway shops. Payment processing is also considered to be **outside** the scope of this project.

1.4 The Project Changes
The main project aim agreed to be personalised promotion using social media, at first. However after having finished the background research, it has been agreed with the supervisor that the project should also include two types of social media marketing campaigns too. It was agreed because, as a result of background research, social media campaigns proved to be as successful way of social media marketing for small businesses.

2. Background Research

Despite the huge attention of restaurants businesses on engaging with their customers using social media, a lot of them have no online presence. Therefore they are left behind, when it comes to smart marketing, where use of mobile phones and grow of social networks have changed the way people and businesses interact [11]. It is reported that still 65% of the restaurants are not online, which means they not taking advantage of e-commerce, neither they make use of social media marketing [1]. Most of them are small, local takeaway shops, with no budget to invest in technology or in technological marketing. This has caused them to consequently miss the opportunity that social marketing brings to boost their sales [1]. This project will enable all of those restaurants businesses that are fallen behind, to catch up with today's modern technological way of marketing and engaging with the customers in a new way.

On the other hand almost all of the big businesses in fast food industry like Domino's Pizza, Pizza Hut, Papa Johns etc. have already started e-commerce from as early as 1994 [12]. In addition they also take advantage of social media marketing. Since technology is getting more advance every year, and mass distribution of smartphones and use of Internet is changing the way we live and do things, the big restaurants and fast food businesses have understood the importance of investing in e-commerce, as well as making use of social media marketing to run their businesses parallel with todays technology [13]. Domino's Pizza has reported that 75% of their sales in 2015 were online, and more than half of these sales have come through their mobile app [2].

2.1 Existing Attempts and Solutions

Having researched the use of social media for marketing prospective, it is found that already businesses are taking advantage of the mass amount of users social media have every minute. Fast food businesses and restaurants trying their bests to stay ahead of the game, and attract as many customers as possible, using social media marketing [14]. They have even tried to target relevant customers with the use of social media, because it has been known the most popular activity on the web [3]. On the other hand some third party aggregators such as Just-eat and Hungryhouse are also already dominant in terms of web presence, ordering faculties, and payment processing for the restaurants [15]. However they haven't touched the field of marketing to enable small brands to promote themselves.
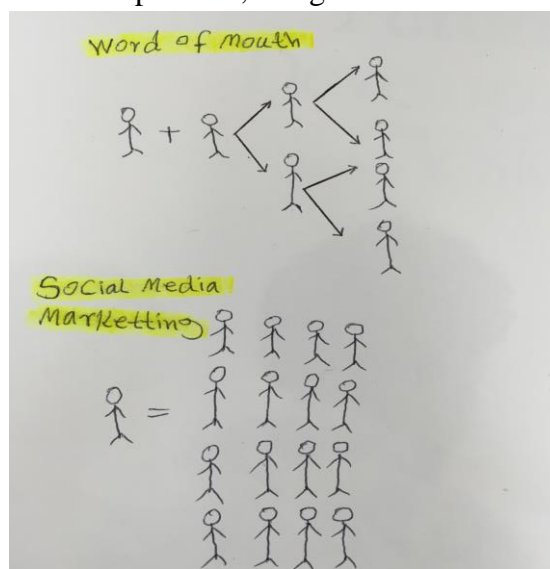

Figure 1 Word of mouth VS social media marketing

On April 2014 Qdoba (Mexican restaurant chain) opened a social media campaign that enabled Qdoba Queso sauce eaters to vote for their favorite Queso sauce [4]. A total of more than 30,000 voters participated in the campaign. **Figure 3** shows visualized information about the campaign result by Qdoba.
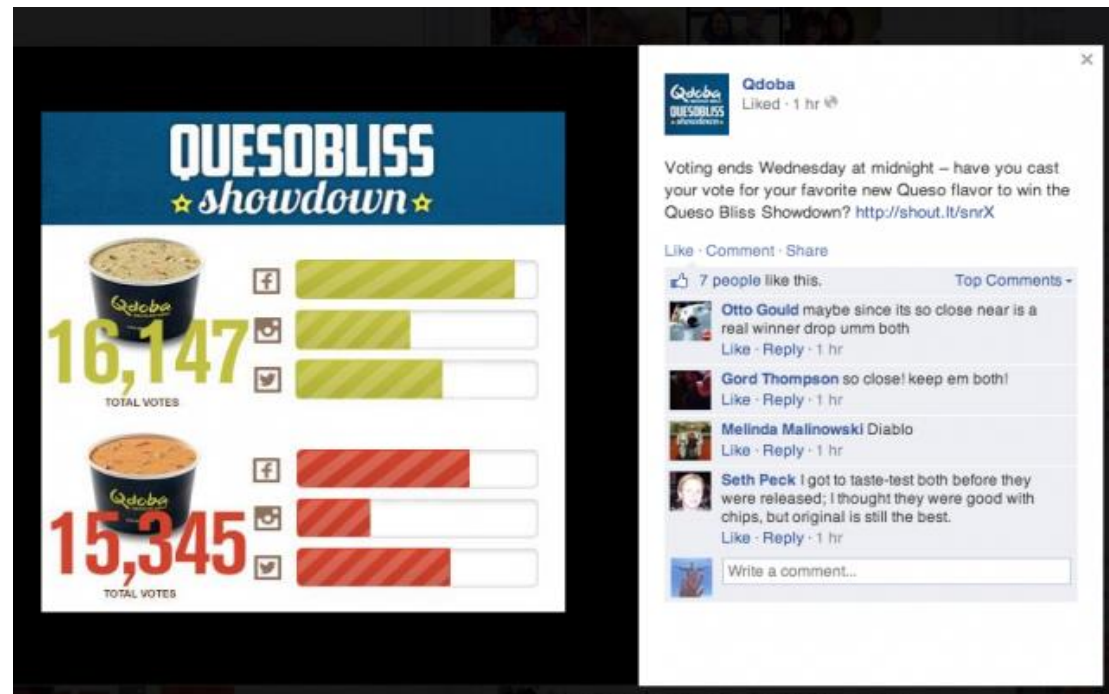

Figure 2 Qdoba Queso compaign screen shot

For Qdoba restaurant this is an official way of connecting customers with their products, and it means that, their voice gets heard by thousands of people out there. This has had a positive effect on their sales and building their brand image [10]. In addition to that, by analysing the customer's tweets and comments the restaurant can learn a lot about their customer's desires, and they can tailor their promotions according to their needs, which will result in huge success in the long run.

On Jun 2015 Havana Restaurant & Bar also held a Giveaway Campaign for the participants to win a free one-hour bar for the winner and nine of his/her friends. The participant were asked to like the restaurant Facebook page and write "Open bar" on their Facebook wall, following them on Twitter and tweeting name of the restaurant, as well as signing up for their emails [5]. Check **appendix 1** for more social media examples.

The two restaurants (Qdoba, Havana) both promoted their campaigns using Wishpond, which is a third party marketing platform, that runs, track, and manage different social media campaigns, not only for the restaurant firms, but also for any other brand [16]. **[Read more about Wishpond on Page 7]**

Qdoba and Havana restaurants social media campaigns are only two examples of how businesses bring awareness about their brands and promotions through Facebook and Twitter. Many restaurants have set up official accounts on social media, having tried different ways of marketing, from campaigns to offering discount for specific group

of followers, to engage with customers and learn as much as possible about their expectations.

2.2 Related Work

As the description clarifies, the aim of this project is to develop a smart system that enables restaurant businesses to analyse customers' activities through social media and subsequently target them for a specific products or promotions. Having researched the closest attempt for targeting relevant customers through social media marketing is done by Wishpond, which is a platform that provides businesses with social media campaigns, and many other marketing tools such as; website popups, online forms, marketing automation, email marketing, retargeting ads and marketing analytics [16]. They uses the power of social media to drive traffic to the advertiser's website. It uses Target Ads feature of Facebook to target customers in a specific geographical area [6]. However unlike the aim of this project Wishpond haven't gone that far to analyse customer's social media activity for personalised promotions targeting.

2.3 The Project Aims

Some high value fast food companies with big budgets, e.g. Domino's and Pizza-Hut are already dominant in terms of having established their own online-presence, e-commerce, and marketing. This project aims to build a social media-marketing platform that is focused on small restaurants and takeaway shops who have no investment in technology. This system will brings the marketing functions of big brands to the small restaurants and fast food businesses, using social media. It will advance the retails system of small businesses with small budgets in the fast food sector to take advantages of the same marketing intelligence as Domino's & Pizza-Hut, which is otherwise far less, affordable for them.

2.4 The Project Objectives

The objectives considered in this project are;

➢ Finding the right social media campaigns for small restaurants businesses, with small budget, and hyper local audiences
➢ Creating a platform for the relevant social media campaigns, and personal advertisement
➢ Evaluate the system by running a real campaign as a trial on one of the local restaurants in the town

Having revised the variety of social media marketing campaigns Wishpond offer to businesses, the restaurants targeted in this project suffer from having no online presence and no social media followers yet. Therefore this project will also focus on two types of social media campaigns that deliver the promoting voice of the restaurant businesses to as many customers as possible, while growing the marketing network at the same time, for sales improvements. This will enhance a big opportunity for the restaurants to introduce themselves and their product to the customers, as well as also learning about their customers' values and desires [8]. Hence it will result in a constant grow in their monthly sales [8]. According to the restaurants needs, the following types of social media campaigns are chosen for this project.

1. Recommend for Reward
2. Re-tweeting Promotion

Recommend for reward campaign is the idea of sharing a page in social media to be liked or registered for. For every respond the recommender will receive a reward, e.g points to be used as discount on meal order. It is a great persuasive technique to grow brand network and pump the promotion message into that network.

Re-tweeting campaign is also allowing the users to tweet a promotion and ask followers to re-tweet it back, and it goes down to followers of the followers to re-tweet it back. At the end of the campaign anyone who got most re-tweeted will win the prize, e.g a free meal for the winner and four of his/her friends. This campaign is chosen because it is also a really powerful technique to grow a marketing network [7].

In addition to providing social media campaigns, this project aims to provide restaurants with personal advertisement. According to the research no other tools have been ever developed that is smart enough to analyse customers social media activities & interests, and roots the advertisement traffic according to the customers desires. This feature of the system will be used mainly for targeting individual customers to be addressed with promotions that matches their personal eating desires.

3. The Requirements Gathering

Since small local restaurants are unable to invest in technology and online presence, like the big brands, I am building a marketing platform that uses social media to enable small firms to improve their branding and sales. The followings are lists of requirements for developing this system.

3.1 Functional and Non-Functional Requirements

The requirements are divided into two categories; functional requirements that relates to what the system should do, and non-functional requirement that refers to the system quality [9]. **Table1** bellow illustrates a list of requirements.

Table 1 List of Requirments

Category	Description	Priority
Functional	Perform analysis on customer's social media activities, and promote relevant product.	High
Functional	Auto promotions distribution to hundreds of customers by email	Medium
Functional	Set a Recommend for Reward social media campaign	High
Functional	Set a Re-tweeting Promotion campaign	High
Functional	Analyse and calculate the campaign result	High
Functional	Calculate the prize	High
Functional	View statistical information about the current state of a campaign	High
Functional	Users should be able to unsubscribe from the promotion emails	Medium
Non-functional	Providing usable and accessible interface	High
Non-functional	Assuring users about their privacy and data protection	High
Non-functional	Easy and clear instruction to participating in the campaign	Medium

4. The Project Plan

Prior to the project development, in this section of the report all the steps and methodology for implementation of the system are explained.

4.1 Initial Design

Figure 4 bellow illustrates the core architecture functionality design of the system, by using Christmas campaign as an example. It will explain how the system interconnected and how will it function.
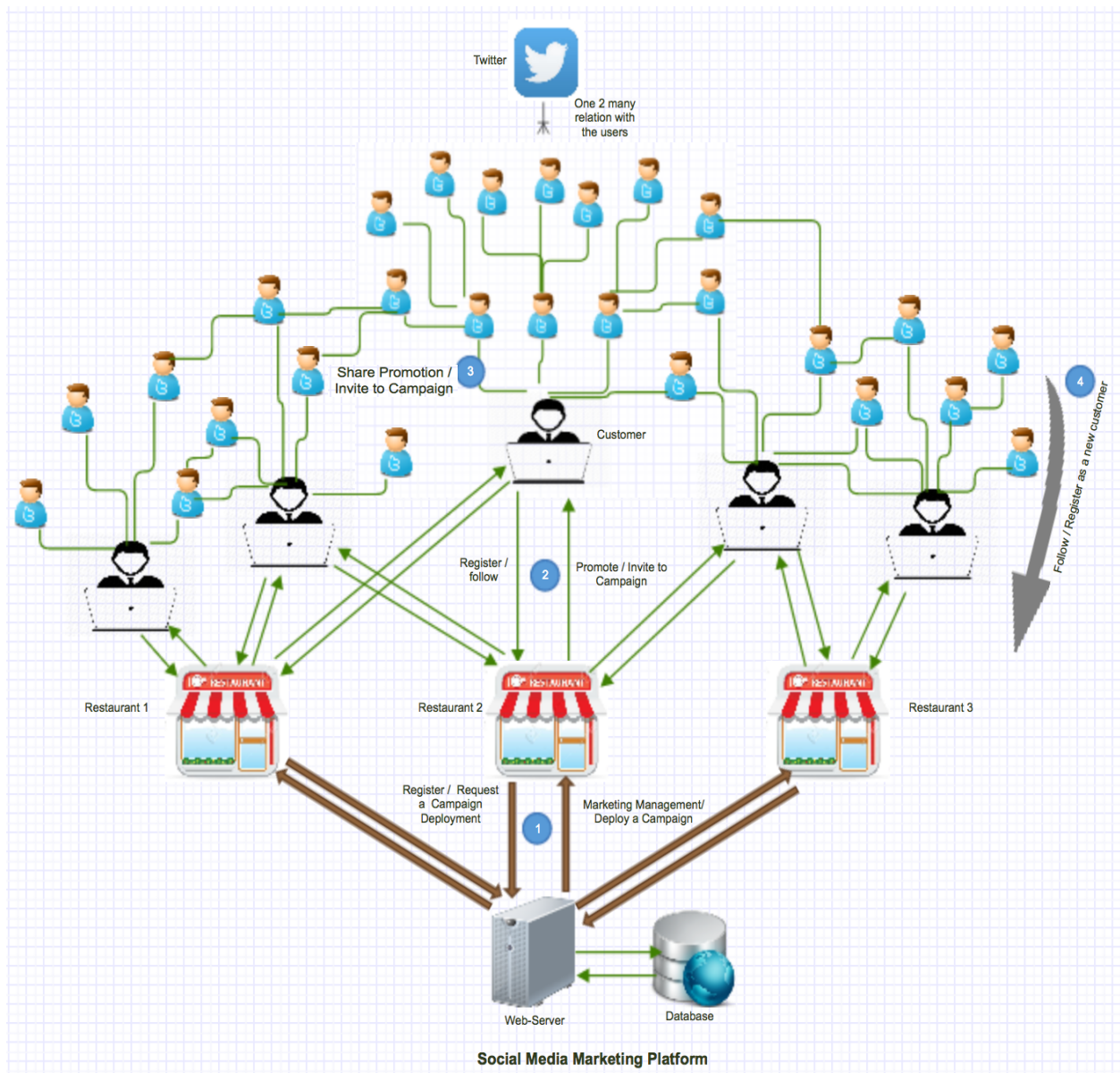

Figure 4 The System Architecture Design

4.1.1 Campaign Walkthrough

Assuming that at least one restaurant is registered with the system, and a few customers are following or registered within the restaurant website. The Christmas campaign is a Re-tweeting campaign that is either requested by the restaurant to be created or recommended by marketing management team to the restaurant and they have to confirm that, by providing some of the parameters needed to create the campaign, such as; start date and end date, the campaign hashtag, a set of offers to be promoted in the campaign, and the prizes for the winners. For this illustrative campaign these are

Restaurant:	British Dining
Campaign Type:	Retweet Competition (winner is person who gets most re-tweets for the restaurant)
Campaign Title:	Christmas Campaign
Start:	1/12/2015, End: 25/12/2015
Hashtag:	#ChristmasSurprise
Offers:	30% off Christmas menu for students
Prize:	Free Christmas dinner for winner

After the parameters are set, the campaign gets launched to the customers as illustrated in **step one** of the design, the customers will share the campaign with their friends and family, as shown in **step three** of the design. As the campaign gets shared and re-tweeted by more and more people the marketing management team will monitor and analyse its performance, and the information will be shared with the relevant restaurant for which the campaign is held. After the deadline the marketing system will summarise the result and calculate the winners. The winners will be notified by email and it will be shared among other users in the network to motivate them for participating in the next campaign. The users who responded to the campaign will now know about the particular restaurant and they might visit the restaurant and register as a new customer. Hence it will result in network growth.

4.1.2 Major Platform Functions

Restaurant Registration: store all restaurant details in database; choose standard website template and fill in details; create empty database of restaurant customers.

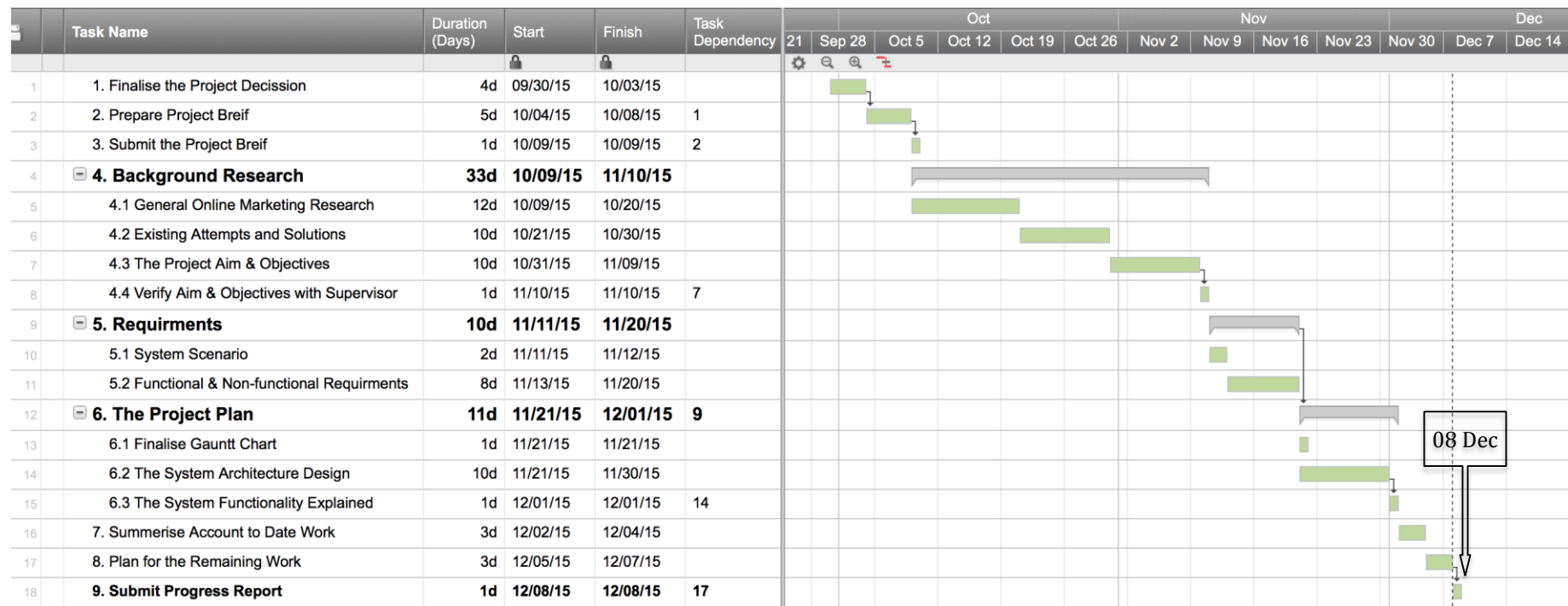*Customer Registration:* store all customer details in database including address info, demographic info, payment details, social media ids for Twitter, Facebook etc.

Campaign Management: create campaign, edit campaign, start campaign, report on campaign progress, halt campaign.

Social Media Management: send message to customers of restaurant, monitor mentions of restaurant, monitor mentions of campaign hashtags.

4.2 Gantt Chart

Figure 5 illustrates a schedule of this project. It represents a list of tasks with its duration in days, and its 'start date' & 'end date', over the first and second semester. Some tasks have dependency with another task, and it is represented under the column "Task Dependency". e.g it is compulsory to finish the requirement before starting the project plan. In the right hand side of the chart, each task is also represented graphically, and it shows any dependencies between tasks, with a drop down arrow.

	Task Name	Duration (Days)	Start	Finish	Task Dependency
1	1. Finalise the Project Decission	4d	09/30/15	10/03/15	
2	2. Prepare Project Breif	5d	10/04/15	10/08/15	1
3	3. Submit the Project Breif	1d	10/09/15	10/09/15	2
4	**4. Background Research**	**33d**	**10/09/15**	**11/10/15**	
5	4.1 General Online Marketing Research	12d	10/09/15	10/20/15	
6	4.2 Existing Attempts and Solutions	10d	10/21/15	10/30/15	
7	4.3 The Project Aim & Objectives	10d	10/31/15	11/09/15	
8	4.4 Verify Aim & Objectives with Supervisor	1d	11/10/15	11/10/15	7
9	**5. Requirments**	**10d**	**11/11/15**	**11/20/15**	
10	5.1 System Scenario	2d	11/11/15	11/12/15	
11	5.2 Functional & Non-functional Requirments	8d	11/13/15	11/20/15	
12	**6. The Project Plan**	**11d**	**11/21/15**	**12/01/15**	9
13	6.1 Finalise Gauntt Chart	1d	11/21/15	11/21/15	
14	6.2 The System Architecture Design	10d	11/21/15	11/30/15	
15	6.3 The System Functionality Explained	1d	12/01/15	12/01/15	14
16	7. Summerise Account to Date Work	3d	12/02/15	12/04/15	
17	8. Plan for the Remaining Work	3d	12/05/15	12/07/15	
18	**9. Submit Progress Report**	**1d**	**12/08/15**	**12/08/15**	17

The Gantt chart continues….

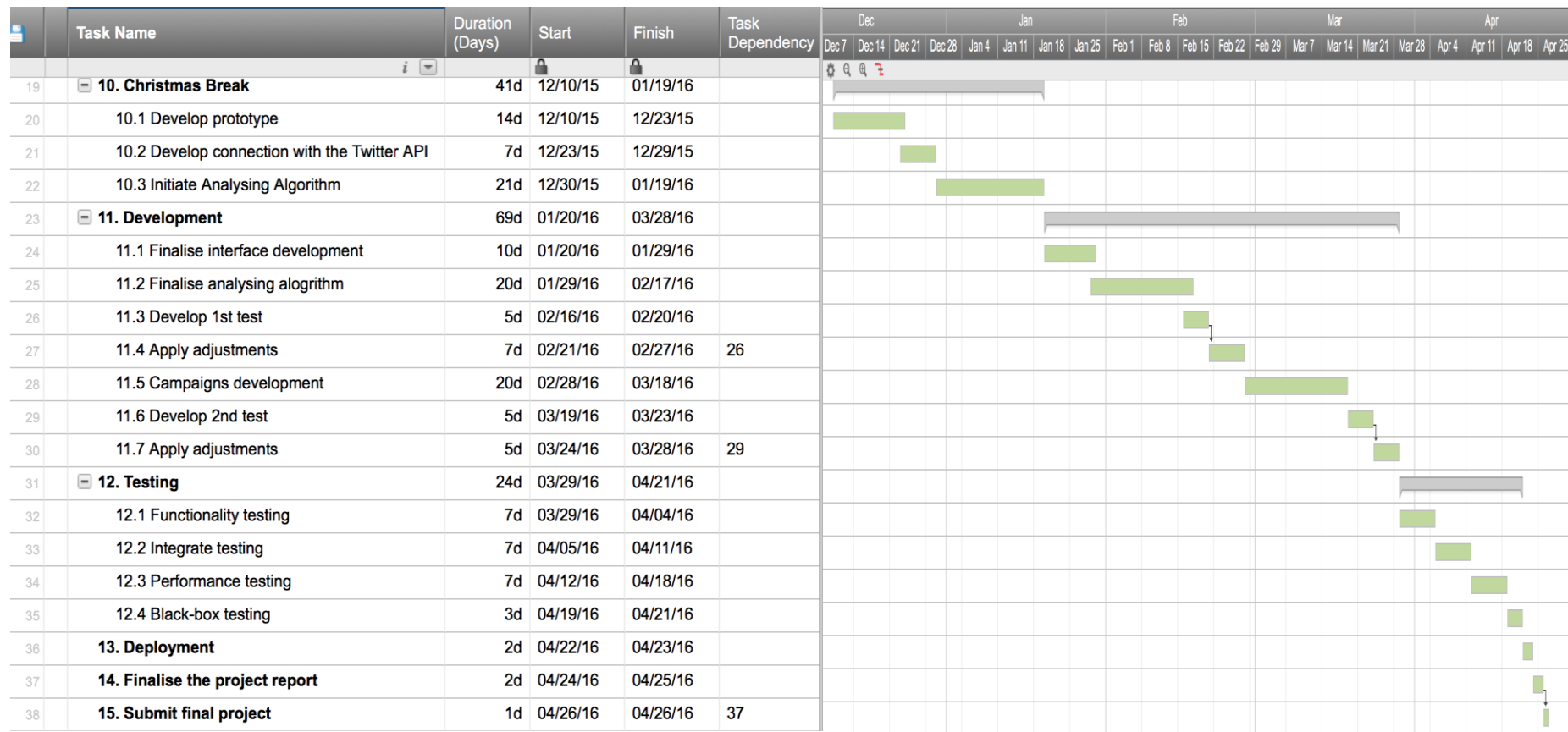|	Task Name	Duration (Days)	Start	Finish	Task Dependency
19	⊟ **10. Christmas Break**	41d	12/10/15	01/19/16	
20	10.1 Develop prototype	14d	12/10/15	12/23/15	
21	10.2 Develop connection with the Twitter API	7d	12/23/15	12/29/15	
22	10.3 Initiate Analysing Algorithm	21d	12/30/15	01/19/16	
23	⊟ **11. Development**	69d	01/20/16	03/28/16	
24	11.1 Finalise interface development	10d	01/20/16	01/29/16	
25	11.2 Finalise analysing alogrithm	20d	01/29/16	02/17/16	
26	11.3 Develop 1st test	5d	02/16/16	02/20/16	
27	11.4 Apply adjustments	7d	02/21/16	02/27/16	26
28	11.5 Campaigns development	20d	02/28/16	03/18/16	
29	11.6 Develop 2nd test	5d	03/19/16	03/23/16	
30	11.7 Apply adjustments	5d	03/24/16	03/28/16	29
31	⊟ **12. Testing**	24d	03/29/16	04/21/16	
32	12.1 Functionality testing	7d	03/29/16	04/04/16	
33	12.2 Integrate testing	7d	04/05/16	04/11/16	
34	12.3 Performance testing	7d	04/12/16	04/18/16	
35	12.4 Black-box testing	3d	04/19/16	04/21/16	
36	**13. Deployment**	2d	04/22/16	04/23/16	
37	**14. Finalise the project report**	2d	04/24/16	04/25/16	
38	**15. Submit final project**	1d	04/26/16	04/26/16	37

Figure 5 The project Gantt Chart

5. Summary of Work to Date

The project started first by agreeing the project brief with the supervisor as shown to be the first task in the (**Figure 5 Gantt chart**). After submitting the brief, the first part of this report focuses on the background research about the social media marketing and e-commerce in general. The existing solutions, that provides similar services to this project discussed in this section too. The aims and objectives of the project are justified in respect to the awareness of the current online marketing and existing solutions.

The report continues analysing the requirements, prioritising and categorising them into functional and non-functional requirements. After requirement analysis, the project plan starts by designing the architecture design of the system. It illustrates how the system will function and how inter-communications take place between the stockholders. This has been explained by giving Christmas campaign as an example, and a list of major functions.

This progress report gets finalised by including the Gantt chart used to manage and keep track of the list of tasks subtask for the progress of this project.

6. Plan for the Remaining Work

Before the end of the first semester the goal is to prepare a prototype model of the system. The system interface design will be first drawn as wireframe, and it will be used to develop the system interface. The prototype will establish a basic connection to the Twitter API and tries to extract relevant information, to help the system target different users with personal promotions. In the start of second semester the main development will begin. The iteration of development will be undertaken by the spiral methodology, and relevant adjustment will be made after each cycle of iteration. The complete development may take 6-8 weeks (4-5 iteration cycle). The project progress will get discussed weekly with the supervisor.

Following the development completion the testing and evaluation phase will take place. This will include black box testing, functionality testing, performance testing, as well as unit testing. The testing will include running a promotion campaign for one of the local restaurants and evaluate the process and the out come of it, therefore in this process support and participation of a local restaurant is needed. The whole testing process will approximately take up to four weeks.