Software Project Management Plan (SPMP)
for
Karlskrona Restaurant Network Website Project

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Revision History

Version	Date	Description	Participants
1.0	2014-11-17	First submission	Navneet Chamala, nach14 Hamid Arsalan, haar14 Uday Majeti V N Anjanaya, vnma14 Waleed Anwar, waan14 Frédéric Moreira, frmo14 Helen Wilhelmsson, hevi10 HUANYU ZHI(Kevin), huzh14 CE ZHOU(Philip), cezh14

Preface

The following Software Project Management Plan (SPMP) describes the overall management plan of the project Karlskrona Restaurant Network (KRN). It is a student project for the course PA2534, Applied Software Management given at Blekinge Institute of Technology. This SPMP is intended to be a guideline for readers to see the flow of the product processes. It shall also be used by the team as a plan throughout the development of the product and by project participants as a reference to project plans and processes.

Table of Contents

1. Overview

The purpose of this document is to give a detailed description of the SPMP for "Karlskrona Restaurant Network" website. In this section, the main details of the product, the scope, assumption and constraints, will be described and listed. The product's objective, deliverables and more related details will also be expounded.

1.1 Project summary

1.1.1 Purpose, scope, and objectives

This project will develop and deliver a new website named "Karlskrona Restaurant Network" (KRN). This website is aiming to collect and exhibit information about restaurants in Karlskrona, which want to join the network and put their products on display to hook the attention of viewers. Restaurants will register to the website and add/ update information about their popular dishes, menu and special offers. Visitors will be able to be the members of website by registration and can search and add ranking and reviews for their favourite food and restaurants. Certainly the customers will be able to log on to KRN anywhere, but the location of participating restaurants information is restricted to Karlskrona.

As a visitor, there are no restrictions to have access to the information about the restaurants. When users browse the KRN, nevertheless, if users want to add rankings the restaurants or share it to other social-networking with their friends, they will be supposed to register the KRN and become a member first. Administrator will be able to delete any account and assign privileges to the members & Restaurant owners.

In order to meet the goals for the project, there is a list of some essential parts of the project scope as follow:

1. Product plan (start-up plan, work plan and control plan, etc.)
2. Website design (database, interface and functions, etc.)
3. Implementation (coding rules, developing the website, etc.)
4. Quality and risk management
5. Acceptance criteria
6. Testing for website (usability test)
7. Training for techniques (tools and programming languages, etc.)
8. Daily scrum and meeting
9. Individual Report
10. Project Presentation

All activities not directly related to the purposes are considered to be out of scope. As a student project, we neglected the financial budget and sponsorship. This will not be included in this project's scope.

As mentioned above the main objectives of this project is to deliver a network where users can rank and search their favourite foods and restaurants. It is also a convenient platform for restaurants to attract new users and get a sound reputation. In this project, we will only deliver a network for all users (restaurants in Karlskrona, visitors and members) on any operating system. The users will be able to use it on any device.

1.1.2 Assumptions and constraints

The project will be planned with the following assumptions:

1. This project is a completed project
2. This project will deliver all necessary materials, the plans, website and reports.
3. The product will be a website.
4. Staff training is necessary for all of the team members, everyone need to learn the new language and techniques.
5. In this project an agile software development approach is going to be implemented for the development of the product.

The project will be planned with the following constraints:

1. Budget

   No budget or sponsorship regarding monetary funds is going to be used in this project, because it is a student project.

2. Time

   Eight students, each person has 200h, in total: 8×200=1600h

   a) Course related tasks**:** 672h

   1. Lectures: 240h
   2. Project plan: 240h
   3. Project Review: 16h
   4. Project Presentation: 16h
   5. Individual Report: 160h

   b) Total time for implementation: 324h

   1. Create database: 8h
   2. Implementation: 295h
   3. Usability test: 20h

   c) Meeting and training: 426h

   1. Sprint meetings: 128h
   2. Daily scrum: 50h
   3. Extra meetings: 64h
   4. Training: 184h

d) Other time: 179h for expand the project in practice

For a more detailed description, see Section 4.1 and Attachment 1.

3. Staff

Eight students from Blekinge Institute of Technology.

The project team has been divided into four development teams. The details of the roles and responsibilities of each development team will be listed in the project organization section.

4. Techniques

a) ASP.NET with razor syntax for server side scripting
b) HTML, JavaScript and CSS for Client side scripting
c) JQuery (a JavaScript Library) for Client side scripting
d) SQL (Structured Query Language), it is a standard language for accessing databases.
e) AJAX (Asynchronous JavaScript and XML).for exchanging data with a server, and updating parts of a web page.
f) Microsoft Word, Microsoft Visio, Microsoft Project and Google Documents
g) Microsoft Web Matrix 3 Integrated Development Environment (IDE)
h) GitHub (a Git repository web-based hosting service)
i) Microsoft IIS (will be used as local host server)

5. Users

Users of the network are restaurant visitors, restaurants and administration.

The restaurants listed in the network are restricted to Karlskrona.

6. Functions

A draft of the functions, layout and pages in the KRN can be found on:

Attachment 2: Features

Attachment 3: Database Layout

Attachment 4: Use Case

Attachment 5: Design KRN

1.1.3 Project deliverables

Item	Date	Media
SPMP	2104-11-17	Document
Project Plan presentation	2014-11-25	Power Point
Code	2015-01-15	

Test result	2015-01-15	Document
User manual	2015-01-15	Document
Project presentation	2015-01-15	Power Point
Individual Report	2015-01-15	Document

2 Definitions

Term	Definition
FCIL	Facilities Available
FLEX	Development Flexibility
IEEE	Electrical and Electronics Engineers
KRN	Karlskrona Restaurant Network
KLON	A Thousand Lines Of Code.
LOC	Line Of Code
PDIF	Platform Difficulty
PERS	Personal Capability
PH	Person*Hour
PM	Person*Month
PMAT	Process Maturity
PREC	Precedentedness
PREX	Personal Experience
RCPX	Product Reliability And Complexity
RESL	Architecture/Risk Resolution
RUSE	Reuse Required
SCED	Schedule Pressure

SPMP	Software Project Management Plan
SRS	Software Requirements Specification
SCM	Source Control Management
IDE	Integrated Development Environment
TBD	To Be Decided
TEAM	Team cohesion

3. Project organization

The SPMP will define the different stakeholders involved in the project and their interaction with the Scrum Development Team, both external and internal processes. Section 3.1 describes the different external processes including roles and responsibilities Section 3.2 describes the different internal processes including roles and responsibilities

3.1 External processes

The parent organization related to this project is Blekinge Institute of Technology. There is no real client, but the assignment initiator is the Department of Software Engineering, with Simon Poulding as responsible for the course PA2515 Ht 14 Applied Software Project Management. There will also be a Scrum team consisting of the Product owners, the Scrum Master and a Scrum development team.

Communication between the Scrum Development Team and the course responsible will be performed via email and in person during the lectures. Communication within the Scrum team will be performed via weekly meetings and by email or instant messages.

All changes to the initial scope and description must be agreed upon between the Scrum Master, Scrum Team and the initiator.
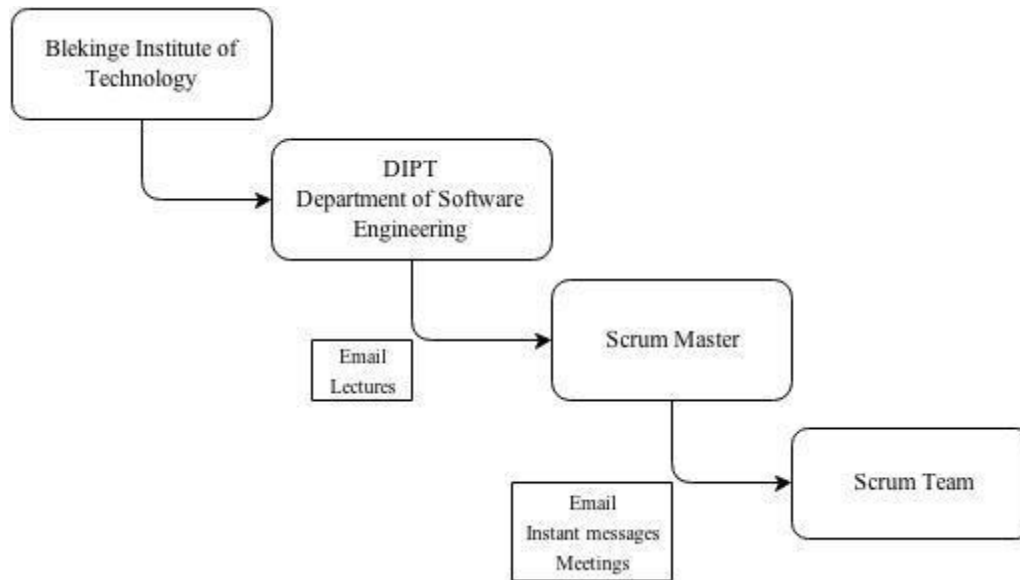
Figure (1): External Organization Structure

Role	Responsibilities
Blekinge Institute of Technology	School the development team are attending
DIPT Department of Software Engineering	The department the course PA2515 Ht 14 Applied Software Project Management belongs to at Blekinge Institute of Technology
Scrum Master	Lead the development process of KRN
Scrum Development Team	-A team of 8 students at BTH enrolled in the course; PA2515 Ht14 Applied Software Project Management -Involve in the development of KRN

3.2 Internal structure

The internal structure consists of a Scrum Master and a Scrum Development team. In this project the Scrum Master will also take part as a member of the Scrum Development Team. The developers will be divided into teams of two, where each team are responsible for the development of the chosen function from the Sprint Backlog. All team members are responsible for contribution to the project. Each team member can contribute with input to the decisions made throughout the development.

The Internal organization is structured as follows:
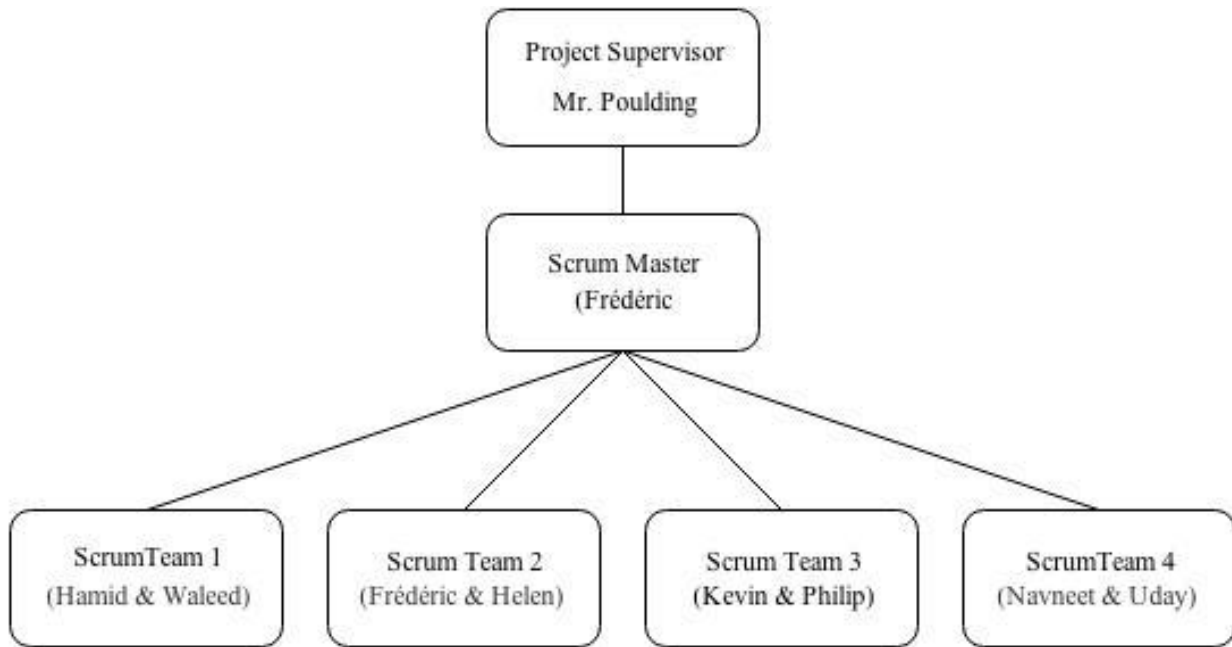
Figure (2): Internal Organization Structure

3.3 Roles and responsibilities:

Project Supervisor: Mr. Simon Poulding

Scrum Master: Frédéric Moreira

Development Team 1: Hamid Arsalan , Waleed Anwar

Development Team 2: Helen Wilhelmsson, Frédéric Moreira

Development Team 3: CE ZHOU(Philip), HUANYU ZHI(Kevin)

Development Team 4: Navneet Reddy, Uday Majeti

Role	Responsibilities
Project Supervisor	-Supervise the project
Scrum Master	-Organize sprint meetings -Organize and monitor the work conducted by the Scrum team. -Review and approve requirements, designs, codes, test scripts, and test reports -Monitor the development of project goals and measurements. -Monitor project plan and processes. -Monitor work progress and work status. -Calculate earned value for the tasks. -Involve in the development, review, and approval of documents. -Manage releases.

Scrum Development Team	-Responsible for the chosen function from the backlog -Create use-case, requirement specification, design, code and test log for chosen function from the backlog -Maintaining and updating of the status of their tasks in order to create an up to date burn down chart.

Previous knowledge amongst in the internal organization

Name	Skill	Level
HelenWilhelmsson	Java, SQL	Low
Frédéric Moreira	PHP SQL HTML CSS JS	Intermediate
Hamid Arsalan	Asp.net Web Pages, SQL	Low
Waleed Anwar	Asp.net, SQL,C, C++	Low
CE ZHOU(Philip)	C#, C++, C	Low
Uday	HTML, CSS,C	Low
Navneet	Asp.net, HTML,CSS, SQL	Low
HUANYU ZHI(Kevin)	C++,HTML	Low

4. Managerial process plans

4.1 Project start-up plan

4.1.2 Estimation plan
As a student project, the project members come from different countries, have different skills and experience. The project is under influence of many factors, such as Product Reliability and Complexity (RCPX), Personal Experience (PREX), Precedentedness (PREC) and so on. The time estimation has been base on the COCOMO II model and the "gut feeling". The "gut-feeling" estimation can be found in attachment TBD.

4.1.2.1 Size estimation
The project consists of the task to complete a restaurant ranking network. The information needed have been found on similar websites on the internet and one of our members had done a website before so we choose the analogous method to estimate the size.

ID	Name	Function	LOC

1	Homepage	Main page of the website, shows the main functions to users.	250
2	Login page	Users can login in this page.	95
3	Create account page	Users can create account in this page	210
4	FB box	In this page, users can login with Facebook account.	100
5	Edit profile page	Users can edit profile in this page.	65
6	Restaurant page	In this page, users can find the information of the restaurant, including map and rating.	200
7	Edit restaurant page	Restaurant users can edit their pages.	80
8	Followers box	Followers are shown in this box.	70
9	Account edit page	Account can be edited in this page.	120
10	Change profile image	Profile image can be changed.	50
11	Change password page	Password can be changed in this page.	100
12	Create restaurant user page	Restaurant users can be created in this page.	80
13	Backoffice	Backoffice is in this part including reports, user, restaurant, comments.	60
14	Reports	Let a Webmaster know about unauthorized behaviours from others Registered User.	80
15	User	Used to manage user.	70
16	Restaurant	Used to manage restaurant, edit it's profile, or delete it.	80
17	Comments	Used to let the users be able to leave a common about the restaurant they visited. Webmaster can manage these commons.	70
Total			1780

Then the size of project is estimated as 1780LOC (1.78KLOC).

4.1.2.2 Effort estimation
Based on the COCOMO II, we know that

$$Effort = A(SIZE)^{(sf)} \times (em_1) \times (em_2) \times (em_3) \cdots \qquad (1)$$

$$sf = B + 0.01 \times \Sigma \qquad (2)$$

Based on the property of our project, we choose A=2.94, B=0.91. Other parameters are showed in the following table:

Driver	Very low	Low	Nominal	High	Very high	Extra high
PREC	6.20	4.96	3.72	2.48	1.24	0.00
FLEX	5.07	4.05	3.04	2.03	1.01	0.00
RESL	7.07	5.65	4.24	2.83	1.41	0.00
TEAM	5.48	4.38	3.29	2.19	1.10	0.00
PMAT	7.80	6.24	4.68	3.12	1.56	0.00

PREC (Precedentedness): Degree to which there are past examples that can be consulted.

Our project is about the restaurants in Karlskrona. It is simple and there are many similar website and open resource on the internet, so we choose very high level (score 1.24).

FLEX (Development flexibility): Degree of flexibility that exists when implementing the project.

As a student project, the functions and requirements are defined by our team members, so the flexibility is high level (score 2.03).

RESL Architecture/risk resolution): Degree of risk and uncertainty about requirements.

This is the first software project should be completed just by ourselves, we have no experience to solve the risk we facing. So we choose low level (score 5.65).

TEAM (Team cohesion) :Degree of the abilities about cooperation in the team.

There are eight members coming from five countries in our team and we don't know each other before. As a result of that, we have difficulties in communicating and we need time to make our team more cohesive. TEAM is low level (score 4.38).

PMAT (Process maturity): Degree of the members' maturity about the project.

No one of us has the experience about this project, we all do this project based on the lectures. So the PMAT is very low (score 7.80).

Then based on the formula (2) and the parameters chosen, sf can be calculated:

$$sf = 0.91 + 0.01 \times (1.24 + 2.03 + 5.65 + 4.38 + 7.80) = 1.121$$

Drive	Extra low	Very low	Low	Nominal	High	Very high	Extra high
RCPX	0.49	0.60	0.83	1.00	1.33	1.91	2.72
RUSE			0.95	1.00	1.07	1.15	1.24
PDIF			0.87	1.00	1.29	1.82	2.61
PERS	2.12	1.62	1.26	1.00	0.83	0.63	0.50
PREX	1.59	1.33	1.12	1.00	0.87	0.74	0.62
FCIL	1.43	1.30	1.10	1.00	0.87	0.73	0.62
SCED		1.43	1.14	1.00	1.00	1.00	

RCPX: Product reliability and complexity.
Our project is a website ranking the restaurants in Karlskrona, it is simple actually. But we lack experience of this kind of project, we choose the low level (score 0.83).
RUSE : Reuse required.
Webpages of our project are similar in the style and layout, so some codes can be reused. RUSE is high level (score 1.07).
PDIF : Platform difficulty.
There are many similar website and open resource, so the difficulty of platform is low (score 0.87)
PERS : Personal capability.
Our team members are good at java, C++, C# but few of us knows ASP.NET, we have to learn ASP.NET and improve HTML, SQL, CSS, GitHub. PERS is very low level (score 1.62).
PREX : Personal experience.
Most of team members haven't done any project like this, and we lack of work experience. PREX is very low (score 1.33).
FCIL : Facilities available.
We can find some open resource, software which is free for students and workplace provided by BTH.
FCIL is normal (score 1.00).
SCED : Schedule pressure.

We are all students and we have more free time than employees, so SCED is low level (score 1.14).

Then based on the formula (1) and the parameters choosed, Effort can be calculated:

$$Effort = 2.94 \times (1.78)^{(1.121)} \times 0.83 \times 1.07 \times 0.87 \times 1.62 \times 1.33 \times 1.14 = 10.65pm = 1618.8ph$$

4.1.3 Staffing plan

According to the size of our project and number of members, we organize our team following the Scrum model. We have eight developers including a Scrum master. The following table shows the number, responsibility, effort, working period, skills needed and rate of different roles.

Staff Type	Number	Skill Needed	Work (hrs)	Project Phases	Period (m/d/y)	Rate
Scrum master	1	Prestigious or experienced among the developers. Having the ability to organize daily work and upload backlog. Be familiar with the languages (ASP.NET,HTML,CSS,SQL) and tools (GitHub,Web Matrix 3). Having the ability to participate in all project phases including plan & requirement phase, product designing phase, coding phase and testing phase. Be responsible, patient and cooperative。	200	All project phases including plan& requirement phase, product designing phase, coding phase and testing phase.	11/04/2014 to 1/15/2015	0
Developer	8	Be familiar with the languages(ASP.NET,HTML,CSS,SQL) and tools(GitHub,Web Matrix 3). Having the ability to take participate in all project phases including plan&	1600	All project phases including plan&	11/04/2014 to 1/15/2015	0

		requirement phase, product designing phase, coding phase and testing phase. Be responsible, patient and cooperative. Be able to assist Scrum master and make recommendations.		requirement phase, product designing phase, coding phase and testing phase.		

4.3.4 Resource acquisition plan

In this project, the human resource includes eight students from the course PA2515 Ht14 Applied Software Project Management at BTH, their roles and responsibilities can be seen in Section 4.4. All non-human resource is listed in the table blow. This project is a student project, the resource we used are either what we have or open resource software, so there is no cost.

Category	Name	Source	User	Cost
Hardware	Computers	All Members	All Members	None
Software	Web Matrix 3	http://www.microsoft.com/web/webmatrix/	All Members	None
	Vision 2013	https://www.dreamspark.com/	All Members	None
	Google Drive	www.Google.com	All Members	None
Facility	Meeting Room	BTH	All Members	None
	Personal Workplace	Member	Member	None
Training Resource	Teaching Resource	www.w3school.com	All Members	None

4.3.5 Project staff training plan

The project team members are not well-trained in their respective disciplines and few of the members have experience in working in a project. As a result, we have to learn how to build and work on our project. The following chart specifies what is needed to learn, how long, the cost, entry criteria, exit criteria and level of difficulty.

Language	Exit Criteria	Staff	Level Of Difficulty (Low, Normal, High)	Time (person*hour)	Method	Exit Criteria

ASP.NET	Minority of us learnt ASP.NET before, others know nothing about it.	Scrum master, all developers	High	8	lectures, mentoring	Staff should know how to use ASP and be able to find errors.
HTML	Majority of us know the basic knowledge of HTML and minority are good at it.	Scrum master, all developers	Normal	4	mentoring, computer-assisted training	Staff should be able to create a webpage including image, sound, video, hyperlinks title, symbol.
CSS	Majority of us know the basic knowledge of CSS, some have to learn from scratch.	Scrum master, all developers	Normal	4	mentoring, computer-assisted training	Staff at least be able to create a pattern with CSS.
SQL	Some of us are good at it, others need improve.	Scrum master, all developers	High	6	mentoring, computer-assisted training	At least staff could complete a sample database system by himself.
GitHub	Majority of us don't know it and should learn it from scratch.	Scrum master, all developers	Low	1	mentoring, computer-assisted training	Staff should know how to create a website with GitHub.

4.2 Work plan

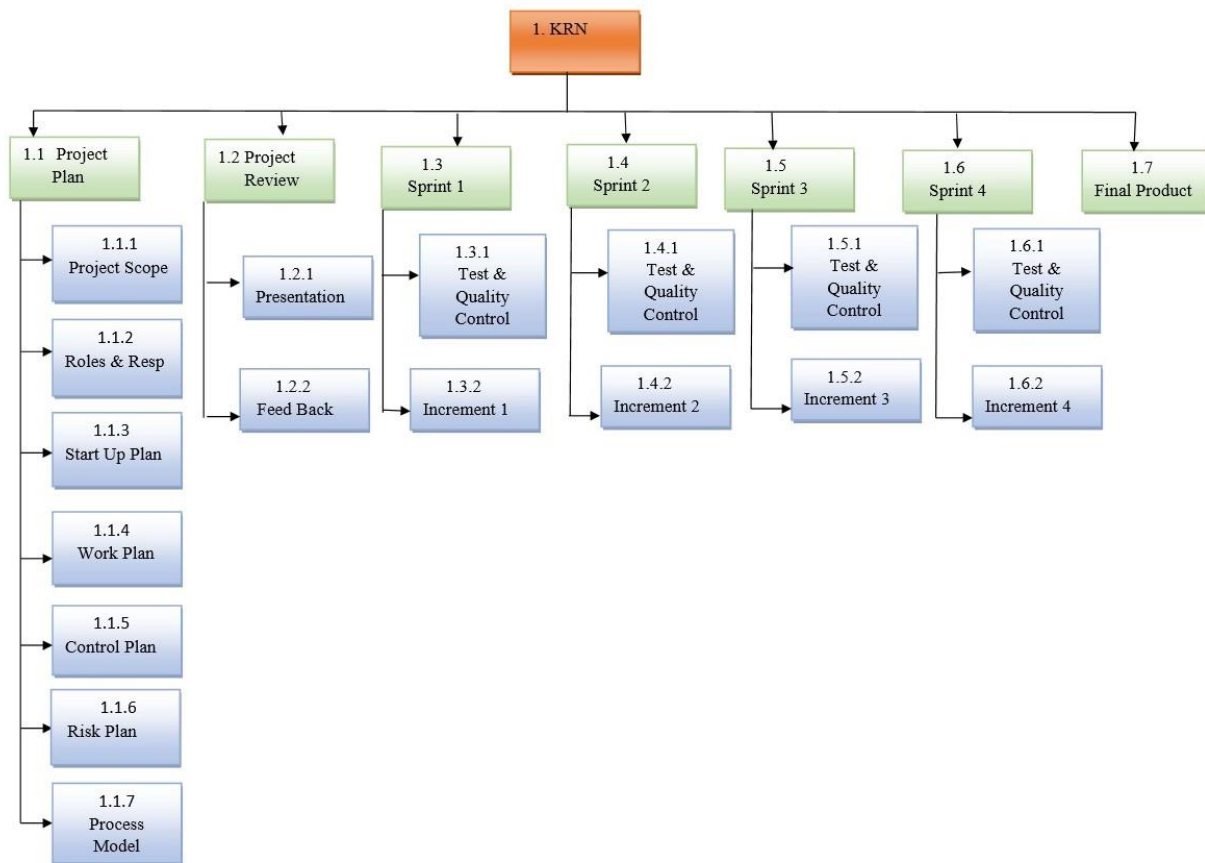### 4.2.1 Work Break down Structure

Figure (3): Work Breakdown Structure for KRN

Description of the WBS

Sr. No	WBS Element	Description
1.	KRN	The project being developed
1.1	Project Plan	To give detail description of KRN website
1.1.1	Project Scope	The scope of this project is to deliver a website to users based on ranking and search their favourite foods
1.1.2	Roles & Responsibilities	The roles and responsibilities allocated to team members.
1.1.3	Start-up Plan	specifies the estimation plan, staffing plan, resource acquisition plan, and training Plan.
1.1.4	Work Plan	It consists of all the work activities, schedule, resources and budget details of project Plan.

1.1.5	Control Plan	It specifies the metrics, reporting mechanisms, and control procedures necessary to measure, report, and control the product requirements, the project schedule, budget, and resources, and the quality of work processes and work products
1.1.6	Risk Plan	It specifies the risk management plan for identifying and analysing the risk factors related to project plan.
1.1.7	Process Model	It specifies the model which was selected to our project
1.2	Project Review	Reviewing the project Plan
1.2.1	Presentation	Presenting our Project Plan
1.2.2	Feed Back	Feedback of our Plan by Supervisor
1.3	Sprint 1	The increment Products of our project are discussed in the sprint meetings. The test and quality control of every sprint product is tested by the scrum teams.
1.3.1	Test &quality Control	
1.3.2	Increment 1	
1.4	Sprint 2	
1.4.1	Test &quality Control	
1.4.2.	Increment 2	
1.5	Sprint 3	
1.5.1	Test &quality Control	
1.5.2	Increment 4	
1.6	Sprint 4	
1.6.1	Test &quality Control	
1.6.2	Increment 4	
1.7	Final Product	Required product of our project

4.2.2 Schedule Allocation

The allocated schedule for this project is shown below in the table

Start Date	End Date	Mile Stones
Nov04, 2014	Nov 17, 2014	Project Plan and Product Backlog
Nov 18, 2014	Nov 24,2014	Sprint 1 (Product Increment 1)
Nov 25, 2014	Dec 01, 2014	Sprint 2 (Product Increment 2)

Dec 02, 2014	Dec 08, 2014	Sprint 3 (Product Increment 3)
Dec 09, 2014	Dec 15, 2014	Sprint 4 (Product Increment 4)
Dec 16, 2014	Dec 18, 2014	Closing of Project Development
Dec 19, 2014	Jan 11, 2015	Individual work and Vacations
Jan 12, 2015	Jan 14, 2015	Group Preparation of Project Presentation
Jan 15, 2015	Jan 15, 2015	Project Presentation

4.2.3 Resource Allocation

Sr. No	WBS Element	Resources Allocated
1.1	Project Plan	● Communication through Skype, Google Hangouts ● Project Team Members ● Meeting Rooms
1.1.1	Project Scope	
1.1.2	Roles & Responsibilities	
1.1.3	Start-up Plan	
1.1.4	Work Plan	
1.1.5	Control Plan	
1.1.6	Risk Plan	
1.1.7	Process Model	
1.2	Project Review	● Project Supervisor ● Team Members ● Class Room
1.2.1	Presentation	
1.2.2	Feed Back	
1.3	Sprint 1	● Library rooms for sprint meeting ● Laptops with required software tools ● Web Matrix 3 ● GitHub ● Scrum Team Members ● SQL SERVER ● ASP.NET
1.3.1	Test &quality Control	
1.3.2	Increment 1	
1.4	Sprint 2	

1.4.1	Test &quality Control	
1.4.2.	Increment 2	
1.5	Sprint 3	
1.5.1	Test &quality Control	
1.5.2	Increment 4	
1.6	Sprint 4	
1.6.1	Test &quality Control	
1.6.2	Increment 4	
1.7	Final Product	Required product of our project

4.3 Control Plan

The Control Plan is maintained and recycled throughout the product life cycle. .The product life cycles primary purpose is to document and interconnect the initial plan for process control. Afterwards, it monitors manufacturing in how to control the process and ensure product quality.

4.3.1 Requirements control plan

Spreadsheet is a tool that will be used during the project to trace requirements from their initial entry through each of the phases through to delivery. All work effort must be related to a traceable requirement, in order to limit unnecessary work and ensure integrity of the product requirements. When a requirement is entered into the system, it is assigned a priority, as follows: [1]

> 3 = mission critical (product must have)
> 2 = important (should exist, but not absolutely necessary)
> 1 = nice to have (should be present if time permits, but is optional)

A requirement's priority will affect the care it receives when trade-offs become necessary, and when changes to requirements are requested. In conjunction with the above, a requirement change priority will also be used to rate the priority of incorporating change to the requirement, as follows:

> 3 = critical (change must be made to requirement)
> 2 = important (change should be made, but not absolutely necessary)
> 1 = nice to have (change should be made if time permits, but is optional)

4.3.2 Product requirements change control

The first thing is that requirements changes with the passage of time and customers continuously change the requirement. As we know that time, cost and scope and inter related with each other so if any of the thing is affected the remaining two will have an impact on them. As the development team is working on agile development So, first thing development team will do is to baseline the requirements from customers by specific time frame, baseline the requirement means that the changes in the requirement can only be welcomed for the specific period of time and there will be the meeting with the Scrum Master and the development team

to check and validate the requirement whether to accept or reject the requirements change. It depends on the type of requirement whether it is minor or major that can affect the overall project scope.

4.3.3 Schedule Control Plan

Critical Path is powerful tool that help you to schedule and manage complex projects. It is commonly used with all forms of projects, including construction, aerospace and defence, software development, research projects, product development, engineering, and plant maintenance, among others. Here we will use the critical path method as a tool to schedule our activities because during management of a project, it allows us to monitor achievement of project goals. It will also help as to see where remedial action needs to be taken to get a project back on course. So to use a critical path method first of all, the activities in a project are listed:

Task	Earliest Start	Length	Type	Dependent on
1-Project Plan	Nov04, 2014	2 weeks	Parallel	
2-Product Backlog	Nov 04, 2014	2 weeks	Parallel	
3-Sprint 1	Nov 18, 2014	1 week	Sequential	1, 2
4-Sprint 2	Nov 25, 2014	1 week	Sequential	3
5-Sprint 3	Dec 02, 2014	1 week	Sequential	4
6-Sprint 4	Dec 09, 2014	1 week	Sequential	5
7-Closing Project development	Dec16	3 days	Sequential	6

4.3.3.1 Critical Path Diagram

After listing the activities, the activities are plotted as a circle and arrow diagram. Here circle shows the events within the project such as start and finish of a task and the arrow shows the dependency of tasks on each other to complete the task.
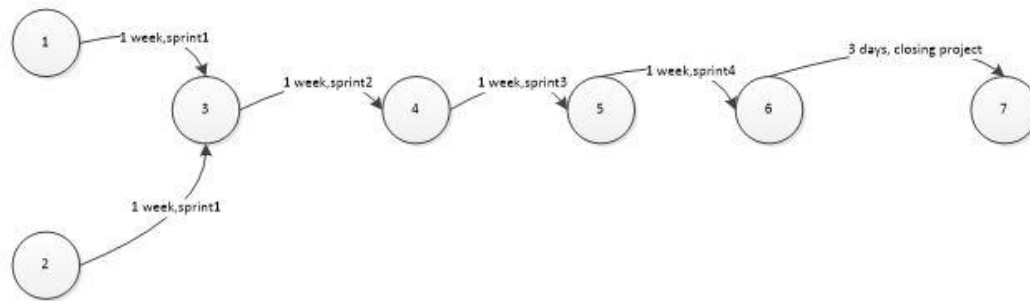
Figure (4): Critical Path Diagram

4.3.4 Quality Control Plan

This will describe the mechanisms development team will use for measuring and controlling quality of work processes and products. For controlling the quality these 3 mechanisms will be used.

4.3.4.1 Meeting

There will be the daily meeting with the pair programmers where they will develop and share the problems they are facing in developing the software to check, test the product and share the ideas to ensure the quality of product.

4.3.4.2 Reviews

There will also be the meeting with the scrum teams/pair programming teams where the teams will review the work of other teams, give them suggestions and help to complete the task with minimum timeframe to achieve the desired quality of product.

4.3.4.3 Defect/issue tracking

Defect /issue tracking will be done by the pair programming teams by themselves by giving the inputs to the system to check whether it responds correctly to particular input or not .If we give 10 inputs and the system responds to every input perfectly then the system is free of defect. If it does not responds to every 10 inputs then it might need a little fix. But if it exceeds to more than wrong 5 inputs then there is a serious issue need to be resolved by the team.

Quality Metric	Trigger
Lines of Code	N/A
Comment Percentage of source code	<5%

4.3.5 Reporting Plan

It will describe the project stakeholders involved and the performance reporting data of project.

4.3.5.1 Stakeholders

The stakeholders in our project are as follows.

1- Mr Simon

2- Scrum Team (Our Team 8 Members)

3- Restaurants

4- Restaurant Visitors

4.3.5.1 Performance Reporting

The project will report performance to plan with the following metrics:

Requirements: Requirements Change Count.

Earned Value: 1-Schedule Control plan

·   Product Increments

·   Sprint Backlogs

2-Effort in Budget Control Plan

Quality: 1-Lines of Code

2-Comment Percentage

Risks: 1-Risk exposure

2- Top 7 Risks

3- Weekly Risk Change

This information will be available electronically in a format accessible by a web browser supporting the HTTP protocol.

4.3.6 Metrics collection:

This section describes the metrics that will be collected during the project and the methods used to collect them. The metrics collected generally fall into one of the following three categories:

1-Effort

2-Reviews

3-Change Requests

4.3.6.1 Effort

Effort metrics will be collected by having project team members fill out timesheet on google drive we created as they work on the project. Each team member will go to the timesheet allocate time that he spent on project. There will be the meeting between team members to tell what he does on that time and what problems he is facing. The team will then sits down and try to solve the problem if he is not able to solve it alone to save time.

4.3.6.2 Reviews

Review metrics will be collected from review of pair programmers which will identify each of the reviewed difficulties as either "errors" or "defects". It will be the concern of pair programmer team to identify each revised problem.

4.3.6.3 Change Requests

Change request metrics will automatically be composed as they are entered into the project's change management database, which is wherever changes are triaged and considered for implementation. As our team is working on scrum so the change requestors will just tell us the changes through email or skype and by looking at the change request whether it is Corrective, adaptive, preventive or perfective the team will accommodate the change.

4.4 Risk management plan:

The process of identifying, analysing and further taking necessary precautionary steps to avoid risks in the course of developing a project is called risk management [2]. Risks like cost over-run, delay in delivery of the project etc., are identified and possible mitigation strategies are planned. Some of the risks are identified at an early stage of the project and some are realized at a later stage. Risk management plan gives a clear overview about the potential risks identified, the likelihood of the occurrence of the risks, the impact on the project, the avoidance and the mitigation policies that we would adopt [3].

In this section of the document we present a list of probable risks that we could identify at the initial stages of our project. The tabular form also holds information pertaining to the effect, likelihood, avoidance and mitigation strategies. The likelihood and the impact of the risks are categorized into high, medium and low categories. Based on the team member's previous experience of working in their student projects, each scrum team underwent a brainstorming session and have come up with the possible risks. The initial set of risks that are identified are presented in this document.

Table: Risk Registry

ID	Identified risk	Likelihood	Impact	Effect	Avoidance strategy	Mitigation strategy	Status
R01	Huge scope	Medium	High	Would require extra effort and time to complete the tasks and might also reduce the quality of the website. It might also result in delaying the	Estimate time and effort appropriately in accordance with the time we have. The effort and time estimates should also include the time and effort needed for activities like	Reduce the scope of the product by reducing certain features of the product and keeping them for future work.	

				delivery of the website.	training and documentation etc. accurately.		
R02	Lack of experience in developing	High	High	None of the members of the team have extensive experience in the developing side. This would probably give a low quality website.	A couple of team members were well versed with the programming language we chose and they are capable of training and helping the rest of the team members to learn the language and code efficiently.	The team members who are experienced and efficient with the programming language should be able to take up the responsibility in solving the issues because it is important to deliver a quality product in time.	
R03	Unavailability of team members	Medium	High	Other team members will have extra work to do resulting in extra effort and might also lead to a delay in delivering the product	All the team members will clearly state their available time throughout the course of the project. If there is any change in the schedule, the member should give prior information to	In case of sudden or unavoidable circumstances, the members should be able to make up for the unavailable time by working from home or assigning the work to	

					the rest of the team.	another team member, provided the other member has the time and willingness to perform the task.	
R04	Issues in team dynamics.	Medium	Low	Since all the members of the team are from different backgrounds, there might be issues like difference in opinion and communicatio n gap.	Any decision about the product will be taken with the consent of all the team members.	The team will collectively decide and deal with any internal issues that could pop up among the team.	
R05	Missing out on regular scrum calls or scrum meetings.	Low	Low	Missing scrum calls and meetings would have an impact in tracking the progress of the project.	Scrum calls and meetings will not be missed by having strict time dedicated for those activities.	The scrum master should make sure that the missed scrum meetings are rescheduled to keep track of the progress.	
R06	Incorrect time or effort estimation	High	High	Incorrect time or effort estimation might lead to delay in delivering the project or	The estimation is done based on experience of the members in their student projects they have done previously.	The team members should identify this at an early stage of the project and make	

				result in extra effort.		necessary changes to the estimates.	
R07	Delay in finishing a task.	High	Medium	Certain tasks depend on the completion of a few other tasks. Delay in completion of a task might lead to delay in beginning and finishing the subsequent iteration and eventually leading to delay in project.	Identify delay in completion of an activity at an early stage. Estimate time needed for each task accurately and include some grace time for each task which can be utilized in case of delay.	Putting in extra effort and extra time to resolve the tasks at an early stage so that the next iteration is not affected.	
R08	Change in requirements			Requirements are subject to change and a change might introduce several changes to the whole project.	The architecture and the process models adopted are flexible to accept changes at any stage of the project.	The changes introduced should be within scope. If not, the change in requirements should be kept for a later version of the product.	

4.4.1 Risk Management

We have adopted the agile scrum model to develop our website. Since scrum is an iterative incremental model, we have risk management included in it. At the end of every sprint all the team members will try to identify the possible risks. All the team members are involved in identifying the risks. The identified risks are first assessed. The risks are assessed based on their likelihood and the impact levels. Then we shall have a respond to avoid or mitigate the risks. Along with the

mitigating strategy we will also retrospect and track down the status of the risks identified in the previous iteration and further act in accordance with the project plan. The risks are resolved based on their impact levels. The ones which would have a high impact on the project will be resolved first and subsequently the medium and low categories of risk. Any new risks that are identified during the course of the project are included in the identified risks table and their likelihood and impact are stated. We shall have another column to track the status of the risk identified. The status tells us whether the risk is solved or not.

Like mentioned previously, we have divided the team of 8 members into 4 teams of two members each to facilitate pair programming. At the end of each sprint every team will exercise the following activities as a part of risk management.

Table: Activities of Risk Management

Activity	Description	Team members responsible
Risk Identification	Risks might change drastically over the course of the project. At the end of each sprint all the team members should have brainstorming sessions discussing the probable risks that might arise.	All 8 members of the team.
Risk Assessment	The identified risks are assessed and its impact and likelihood are defined by discussing with the rest of the team.	All 8 members of the team.
Risk Avoidance/ Mitigation	The assessed risks are avoided or mitigated based on the order of priority or impact.	All 8 members of the team.
Risk Retrospection	All the previous risks and their status are also checked at the end of each sprint.	All 8 members of the team.
Update Risk register	After finishing the above phases of the risk management plan the	All 8 members of the team.

	members will have to update the risk register indicating the status of the risk so that the rest of the team are also aware of the risks.	

The above defined activities are executed at the end of every sprint. The activities are defined in synchronisation with our process model. At the end of each sprint all the activities mentioned above are carried out. This is done at regular intervals to keep track of the risks and to identify the risks that can creep up along the course of the project. As we are using an agile model to develop the website, there can be risks arising at the end of each increment. Thus, this is how we plan to tackle and mitigate the risks in our current project.

5 Technical process plans

5.1 Selected Process Model

It is planned to use Agile Software development approach to develop the project, Scrum software Development with pair programming technique will be used to develop the project.

As illustrated in the Figure (), the project has been started with developing the product backlog (i.e. a set of required product features and functions). After preparing the product backlog, project development will be started in the form of Scrum sprints. It is planned to complete the project development in 4 scrum sprints, each sprint will be of 1 week duration. There are 8 team members, it is planned to make 4 scrum teams having 2 team members in each team. On the start of each sprint, a meeting between Scrum Master and Scrum teams will be held to make the sprint backlog (by selecting required product features and functions from product backlog) and divide the work among the scrum teams. Every scrum team will be responsible for its own management and will use the pair programming technique in order to complete its work in efficient way. The Sprint will end with an increment to the project development. In upcoming sprint meetings, previous sprint work will also be reviewed in order to learn from mistakes and get new experiences. At the end of 4th sprint, the project development is planned to be completed.
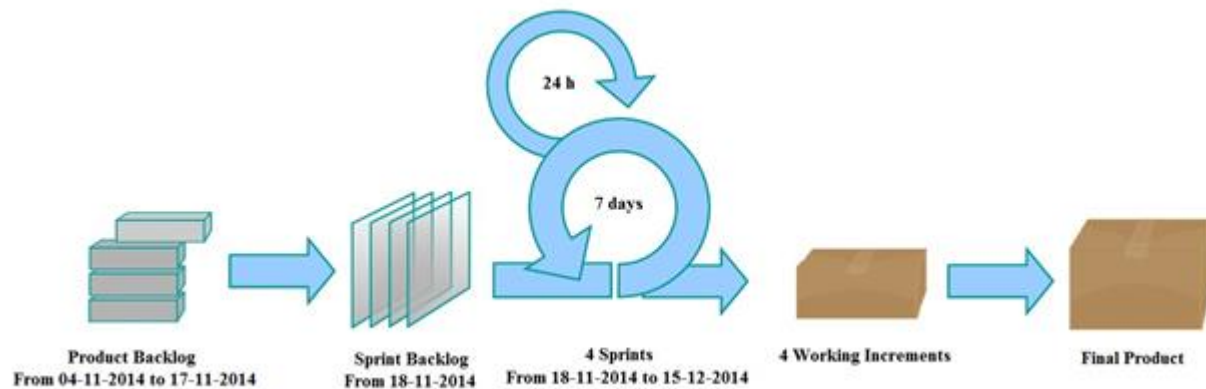
Figure (5): Selected Development Model

Motivation behind Selection of Scrum Development Model with Pair Programming:

The main reason behind selecting the Scrum development model is that it allows the development team to review each sprint before moving to the next, so testing is conducted throughout the process, which allows the team to change the scope or direction of the project at any point. Scrum also provides flexibility for scrum teams to distribute the tasks of sprint backlog according to their capabilities. The pair programming technique within the scrum team will allow the developers to share programming experiences and learn from each other. Every scrum team has members with similar cultural values so it will increase the cohesiveness of the scrum teams.

Other Process Models:
- We are not using Waterfall Model because in this model, the requirements cannot be changed easily during development process and it is based on traditional management style whereas we want to distribute management functions to the whole team.
- In the Incremental Model, the work is also completed and tested in increments same as the sprints in Scrum process but we are not using it because it is a traditional development model so it does not distribute the management functions to the development teams.

5.2 Methods, tools, and techniques
5.2.1 Programming Languages
Following programming Languages have been selected for website development:
- **ASP.NET:** It is a development framework for building websites with server side scripting, the asp.net webpages method has been chosen to develop the website.
- **HTML:** It stands for Hyper Text Markup Language, it is a markup language for describing web documents.

- **JQuery:** It is a JavaScript Library, it greatly simplifies JavaScript programming, and JavaScript is a Client side scripting language used in websites.
- **CSS:** It stands for Cascading Style Sheet, Styles in CSS files define how to display HTML elements on the webpages.
- **AJAX:** It stands for Asynchronous JavaScript and XML, it is not a new programming language, but a new way to use existing standards. It is the art of exchanging data with a server, and updating parts of a web page - without reloading the whole page.
- **SQL:** It stands for Structured Query Language, it is a standard language for accessing databases.

5.2.2 Tools and Techniques

● Microsoft Word and Google Documents has been used to create the documentation of the project.
● Microsoft Web Matrix 3 Integrated Development Environment (IDE) will be used as a Stand-alone IDE for code editing, webpage designing, database management and version control system management.
● GitHub (a Git repository web-based hosting service) will be used for distributed revision control and source code management (SCM) functionality.
● Microsoft IIS will be used as local host server to check/ test the functionality of the website during development and before publishing the website.

5.2.3 Resources

Every team member has a laptop with Windows Operating system and an internet connection of 10Mb bandwidth. Web Matrix 3 is a free IDE and it is also installed on every Laptop for project development. Team is able to conduct meetings in the BTH library rooms. Other sources of communication between team members are Mobile phones, Google Hangout and Skype. We are using Google Drive to view and edit project documentation.

References

[1] http://www.projeegitimmerkezi.com/userfiles/file/detailed.pdf

[2]   G. Stoneburner, A. Goguen, and A. Feringa, "Risk management guide for information technology systems," Nat. Inst. of Stand. & Technol., USA, USA, 2002.

[3]   W. R. Duncan, "A guide to the project management body of knowledge," 1996.
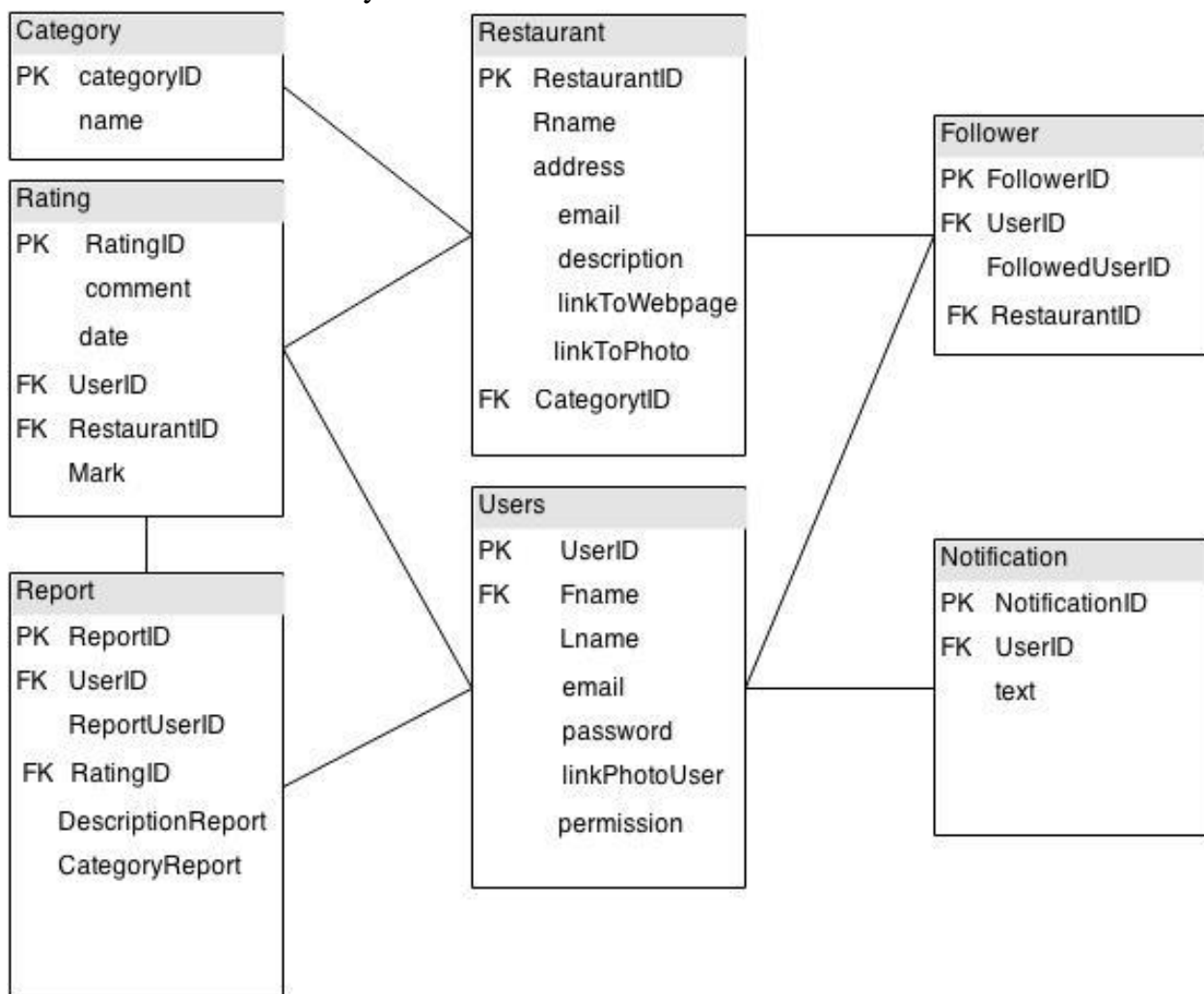
Attachments

Attachment 1 Time estimation based on "gut-feeling"
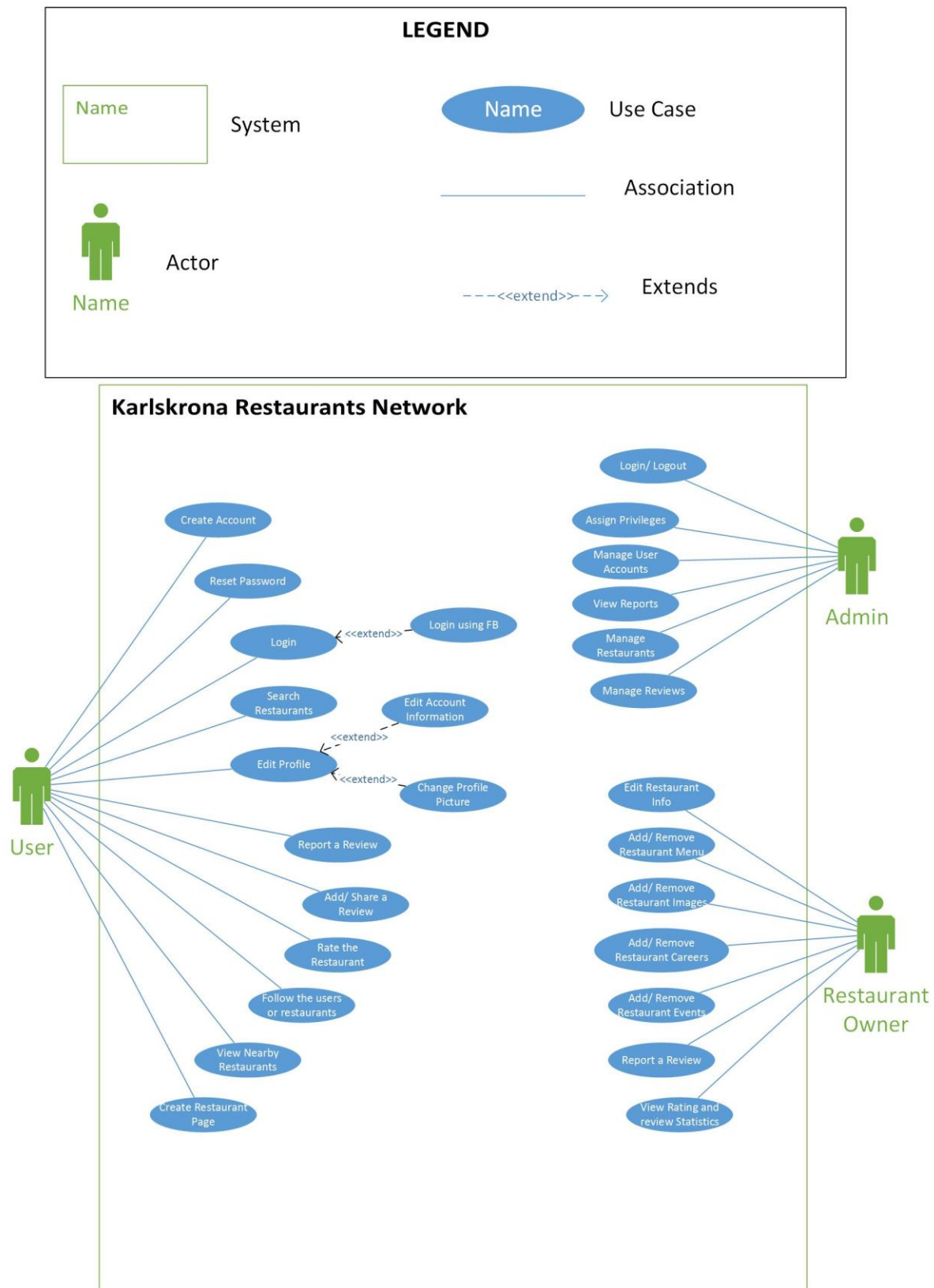See attached PDF document

Attachment 2 Features in KRN
See attached PDF Document

Attachment 3 Database Layout

Attachment 4 Use Case

Attachment 5 Design KRN