Social Media in the Process Automation Industry

Distributed Software Development
Project Plan   Version 1.0

In co-operation with:

Title:
 Social Media in the Process Automation Industry

Course:
 Distributed Software Development

Document:
 Project Plan

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Date:
 January 13, 2013

Revision History

Initials	Action	Date	Version
RG, DP	Created a skeleton and filled in all sections	22.10.2013.	0.01
MM, MMi, DP	Revised the skeleton and improved it further	22.10.2013.	0.02
RG	Fixed comments on the document	23.10.2013.	0.03
MM, MMi	Proofreading revision	24.10.2013.	0.04
DP	Revised, fixed activity plan, added Gantt chart	25.10.2013.	0.05
MMi	Proofreading revision	26.10.2013.	0.06
RG	Added milestones and deliverables	28.10.2013.	0.07
DP	Added a section regarding activity, updated and commented the Gantt chart	28.10.2013.	0.08
DP	Fixed the document according to the comments by the supervisor	28.10.2013.	0.09
DP, RG, MMi, MM	Document revision, visual finalization for v0.1 version	28.10.2013.	0.10
MM	Overall Review	13.1.2014.	1.0

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Introduction   1

1.1   Purpose of this document

This document lists and provides a detailed description of requirements that will be useful in the software implementation process, which will take place from 04/11 till 26/12. Requirements are categorized and prioritized by the requirement team. Moreover, this document includes use-case diagrams used to describe them. The purpose of these diagrams is to give a clear overview of the interaction of users and other actors with the system. Additionally, they can be used for verifying all the specified functions are implemented in accordance to the requirements.

1.2   Intended Audience

The project team members should use this document as a reference for decisions made during the initial stages. It states the workload of each team member, team organization and timeline to determine the current project status. This document is also intended for the team leaders so it can serve as a tool for decision making during the next weeks.
It is also intended for the supervisor who can use this document for checking the planned project development.

1.3   Scope

This document gives a brief overview of the project. It describes details about team organization, like the project roles of each of the team members and the way how communication between distributed team members should be handled. Furthermore, it states the deliverables, milestones and the development process in general. However, the document does not state the requirements analysis and system design or some other details related to the project.

1.4   Abbreviations

In this section, we provide short explanations for each of the abbreviations that have been used and mentioned in this document in order to make sure that every abbreviation used here will be properly understood by everyone who will read the document.

Abbreviations	Explanation
MDH	Mälardalen University, Västerås, Sweden
FER	Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia
ABB	(Asea Brown Boveri) A multinational corporation with focus on robotics, power technology and automation
Mng	Manager
PM	Project Manager
App	Application
DSD	Distributed Software Development
ER	Entity Relationship

Table 1. *Abbreviations*

Background and Objectives 2

2.1 Customer

The customers are Aneta Vulgarakis and Jonas Bronmark from ABB, which is one of the largest engineering companies in the world. It is based in Switzerland, with headquarters also in Sweden. The main focus of the company is on power and automation energy, but it involves robotics as well. A very important advantage for the team members is that ABB has its own branch in Västerås. Having more than half of the team members situated in the same town as the customer facilitates the communication and makes it possible to have meetings in person with the customer, especially when requirements are to be defined or stakeholder's expectations are not clear to the project team.

Website: www.abb.com
Contact: Aneta.Vulgarakis@se.abb.com

2.2 Supervisor

Federico Ciccozzi, PhD - Mälardalen University
Contact: Federico.Ciccozzi@mdh.se

2.3 Project vision

The project vision implies building a desktop and a device application that would practically have the features of social media for communication within a factory. The purpose of building this application is to facilitate the communication between the small factory employees as much as possible. The benefits of it are multiple, and they involve facilitating the process of stating different technical or professional issues in the company, reporting them to other colleagues and trying to provide and agree on reasonable solutions.

Regarding characteristics, features and functionalities that this social media should have and provide, the team may be able to get inspiration by investigating other existing social media while working on the application. Additionally, it has to support troubleshooting and prescribed routines for certain issues that workers encounter (procedures during a certain type of maintenance, repair and so forth). Finally and most importantly, it should support the control and monitoring of workflow processes. Those include work orders, planning of shifts and so on.

Communication between the application users is expected to include several functionalities, such as the user must be able to make a post and other users must be able to make notes and comments related to that post in order to give feedback for a certain technical issue. It should be

possible to make personal and technical notes, and each user shall have its own profile page as in other existing social media solutions. All user accounts are predefined.

Information can be introduced by humans and machines as well, i.e. sensors that can report their status. An alarm can be activated when sensor parameters are either above or below the intended threshold. Users should have the possibility of reviewing data history in general. In particular, keeping a history of data related to sensors is very important.

Organization and Communication 3

Members of the project team are located at two different locations in Europe, Sweden and Croatia. Therefore, there will be one project leader in charge of driving the communication with the customers as well as between the two distributed teams. In the country where the project leader is not present, there will be a local team leader whom will collaborate with the project leader for communication issues and will be in charge of managing the team locally.
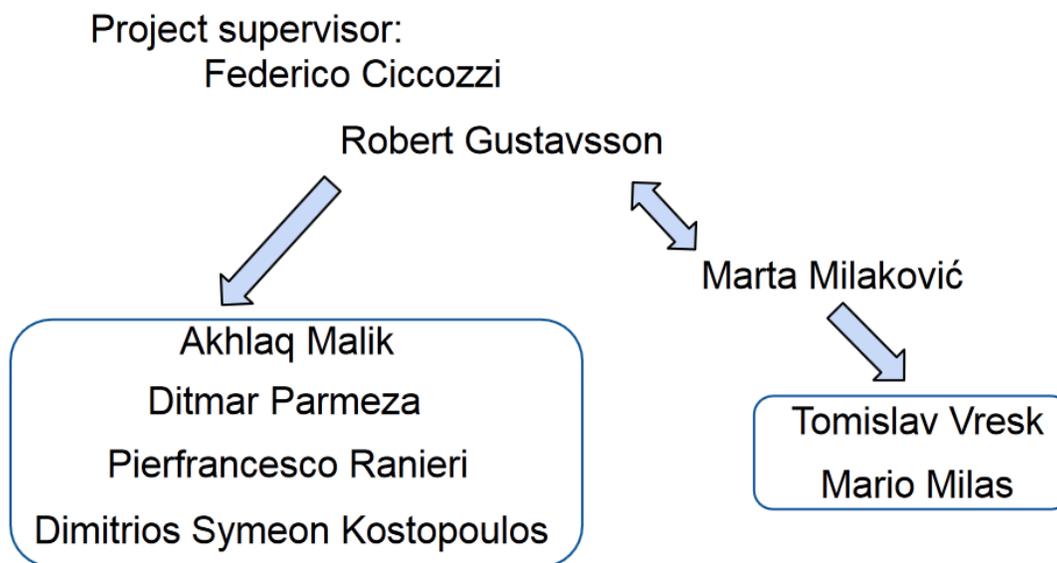

Diagram 1:   *Team organization*

3.1   Project group

The project group consists of eight members from two different countries. Five are from Mälardalen University in Sweden, and three are from University of Zagreb in Croatia. All members are in the 2nd year of master in computer related studies.

Name	Initials	Primary Roles	Secondary Roles	Contact
Robert Gustavsson	RG	Project Mng.	Integration Mng.	rgn09003*
Dimitrios Kostopoulos	DK	Requirement Mng.	Lead Developer	dks12001*
Ditmar Parmeza	DP	Testing Mng.	Team Leader (MDH)	dpa12001*
Akhlaq Malik	AM	Storage Content Mng.		amk13004*
Pierfrancesco Ranieri	PR	Database Mng.		pri13001*
Marta Milaković	MM	Team Leader	Lead Developer	marta.milakovic**
Mario Milas	MMi	Document Mng.		mario.milas**
Tomislav Vresk	TV	User Interface Mng.	Design Mng.	tomislav.vresk**

* @student.mdh.se, located in Västerås, Sweden.

** @fer.hr, located in Zagreb, Croatia.

Table 2.   *Project members, their initials, roles and contact information*

3.2   Roles Description

Project Manager

The project manager keeps control over the overall development process and guides the team to ensure that the project is going according to the plan. He is also responsible for providing work for the upcoming weeks throughout the project. Besides that, he is working as a preferred contact between the project team and both the customers and the supervisor.

Team Leader

The team leader will be the project manager's right hand on the Croatian side. She will lead the Croatian team and will be the main contact there.

Requirement Manager

The requirement manager will be the main responsible person for checking in each step of the development process if requirements are being fulfilled properly when it comes to design and implementation. He will make sure that the main functionalities covered by functional requirements have been designed and implemented according to the specifications in the requirement document.

Testing Manager

The testing manager will make sure that the tests which are going to be run are designed in accordance to the provided requirements. He will also be primarily responsible for the acceptance testing.

Storage Content Manager

The storage content manager will make sure that the rules are followed when it comes to the GIT storage and will also make sure that the content stored is relevant to the project.

Database Manager

The database manager will be the charge of for setting up the database and administrate it. He will also make sure that the actual implemented design is relying properly on the ER-chart.

Document Manager

The document manager will be responsible for the documents of the project. Responsibilities include proofreading the documents, as well as publishing them on the DSD page.

User Interface Manager

The user interface manager will be primarily responsible for the graphical user interface of the applications, and is especially focused upon usability.

Lead Developer

There will one lead developer in each country that is responsible for knowing the current state of the implementation, but also act as a development supervisor to ask questions to.

Integration Manager

The integration manager has the primarily responsible for the integration interfaces between components, classes and layers inside of the applications.

3.3   Meetings

The whole team will meet twice a week, on Mondays at 21:00 and during that meeting the time of second meeting will be decided. These meetings will contain status reports, common issues, upcoming activities, and so on. During these meetings a "minutes of meeting" document will be written, and the author of that document will vary throughout the project. After each meeting, the document will be published on the DSD webpage.

During the weeks there are also going to be meetings within the smaller groups which are working on a common problem. These meetings will focus on the current status, thoughts and problems about the current task. Notes during these meetings should also be taken to inform the rest of the team what has been decided, designed or implemented.

3.4   Weekly Reports

Every Sunday, each team member will fill in a weekly report and upload it to the team Google Drive. The weekly report should contain finished activities, hours spent on those, problems and other comments; and should follow the template given by the supervisor.

On Mondays, the project manager will summarize these reports into a document and publish it to the DSD webpage. Reports should contain completed activities, upcoming activities, actions, current milestones and working hours for all members. This document should follow the template for weekly summary given by the supervisor.

3.5   Communication

The main form of communication within the group will be Microsoft's **Skype[1]** . This will be used for voice meetings and also instant message chatting (**IM**). **In-person meetings** will be arranged as well, but only within the local teams.

Google Drive[3] will serve as the main communication tool regarding documentation. Each necessary document will be shared on Google Drive, and each team member will have the possibility to access them and contribute into writing, improving and keeping all the documentation up to date.

Moreover, **Google+[4]**   will be used for posting events such as meeting with the customer and discussing issues related to those meetings.

As for the coding part during the implementation phase of the project, **GitHub[2]** will be the main tool for committing source code files in the repository. This way, each file will be shared so each team member will have the chance to commit, view and give feedback for the code as well.

The customers and the supervisor will be contacted via **email** by the project manager.

Project Plan

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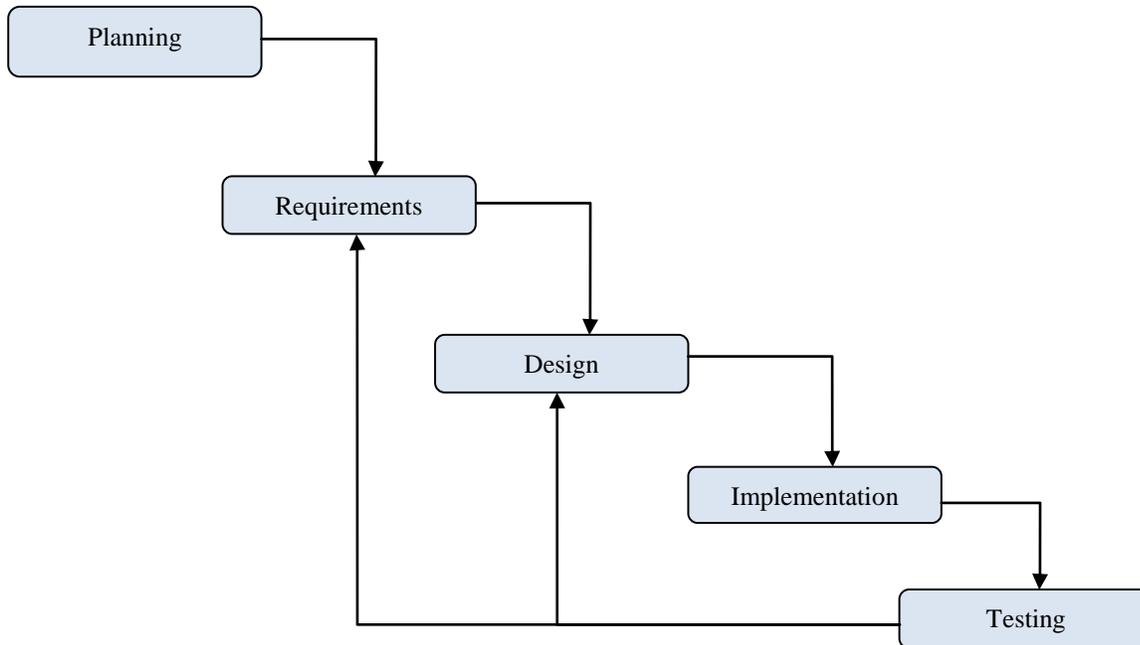
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4.1 Development process

Diagram 2: *Development phases*

The development process used in this project will be an incremental waterfall method. The project will be divided into two major phases, where the first phase uses overlapping waterfall method to establish good planning, requirements and a stable design. The second phase will then consists of an incremental development, where parts of the implementation will be selected during each iteration to gradually build the applications. The iterations will also contain reviewing and fixing the documents to keep them up-to-date.

4.2 Milestones

The table below represents important states in the project. Milestones are chosen as the endings of the phases inside the plan. The week number represents a deadline for each milestone. This means that by the end of that week each milestone should be done. The three first milestones mean the initial versions of the documents, and the final versions are then included inside of M07.

Internal

Internal milestones are minor milestones that when put together becomes an external milestone.

ID	Name	Responsible	Week	Delivered week	+ / -	Remark
MI01	Alpha: Device App	MM	48	48	0	-
MI02	Alpha: Web App	AM	48	48	0	-
MI03	Alpha: Simulator App	RG	48	48	0	-
MI04	Alpha: Database	PR	48	48	0	-
MI05	Alpha: Revised Docs	MMi	48	48	0	-
MI06	Alpha: Testing	DP	48	48	0	-
MI07	Beta: Device App	MM	51	51	0	-
MI08	Beta: Web App	AM	51	51	0	-
MI09	Beta: Simulator App	RG	51	51	0	-
MI10	Beta: Database	PR	51	51	0	-
MI11	Beta: Revised Docs	MMi	51	51	0	-
MI12	Beta: Testing	DP	51	51	0	-
MI13	Final: Device App	MM	03	02	-1	Done earlier
MI14	Final: Web App	AM	03	02	-1	Done earlier
MI15	Final: Simulator App	RG	03	52	-3	Done earlier
MI16	Final: Database	PR	03	52	-3	Done earlier
MI17	Final: Project plan	MMi	03	03	0	-
MI18	Final: Requirements Definition	MMi	03	03	0	-
MI19	Final: Apps Architecture	MMi	03	03	0	-
MI20	Final: Testing	DP	03	03	0	-

Table 3. *Internal Milestones*

External

ID	Name	Mandatory Milestones	Responsible	Week	Delivered week	+ / -	Remark
ME01	Project vision		DP	43	43	0	-
ME02	Project plan		RG	44	44	0	-
ME03	Requirements Definition		DK	45	45	0	-
ME04	Apps Architecture		MM	45	45	0	-
ME05	Alpha Stage	MI01-MI05	DP	48	48	0	-
ME06	Beta Stage	MI06-MI10	TV	51	51	0	-
ME07	Final Stage	MI11-MI13	RG	03	03	0	-

Table 4. *External Milestones*

4.3 Deliverables

The deliverables are the results of the project that will be delivered to **C**ustomer, **S**upervisor and/or the **T**eam itself. The table below represents all the expected deliverables of the project and the expected date that they should be handed over to the specified recipient.

ID	Deliverable	Recipient	Hand-in Date	Actual Date	+/-	Remark
D01	Project Plan document (v.1)	C, S, T	2013-10-28	2013-10-28	0	-
D02	GUI v.1	C,S,T	2013-10-30	2013-10-30	0	-
D03	Use-cases v.1	C,S,T	2013-10-30	2013-10-30	0	-
D04	Requirements document (v.1)	C, S, T	2013-11-06	2013-11-06	0	-
D05	Design document (v.1)	C, S, T	2013-11-06	2013-11-06	0	-
D06	GUI v.2	C,S,T	2013-11-06	2013-11-06	0	-
D07	Coding Policy	C,S,T	2013-11-08	2013-11-08	0	-
D08	GIT Policy	C,S,T	2013-11-08	2013-11-08	0	-
D09	Database Server	T	2013-11-12	2013-11-12	0	-
D10	Webserver	T	2013-11-12	2013-11-12	0	-
D11	Alpha: Device App	C,S,T	2013-11-28	2013-11-28	0	-
D12	Alpha: Web App	C,S,T	2013-11-28	2013-11-28	0	-
D13	Alpha: Simulator App	C,S,T	2013-11-28	2013-11-28	0	-
D14	Alpha: Database	C,S,T	2013-11-28	2013-11-28	0	-
D15	Requirements document (v.2)	C,S,T	2013-11-30	2013-11-30	0	-
D16	Design document (v.2)	C,S,T	2013-11-30	2013-11-30	0	-
D17	Beta: Device App	C,S,T	2013-12-19	2013-12-19	0	-
D18	Beta: Web App	C,S,T	2013-12-19	2013-12-19	0	-
D19	Beta: Simulator App	C,S,T	2013-12-19	2013-12-19	0	-
D20	Beta: Database	C,S,T	2013-12-19	2013-12-19	0	-
D21	Requirements document (v.3)	C,S,T	2013-12-20	2013-12-20	0	-
D22	Design document (v.3)	C,S,T	2013-12-20	2013-12-20	0	-
D23	Acceptance test plan	C, S, T	2013-12-31	2013-12-31	0	-
D24	Test Report	C,S,T	2014-01-08	2014-01-08	0	-
D25	Final Report	C, S, T	2014-01-13	2014-01-13	0	-
D26	Final version, plan document	C, S, T	2014-01-13	2014-01-13	0	-
D27	Final version, req. document	C, S, T	2014-01-13	2014-01-13	0	-
D28	Final: Device App	C,S,T	2014-01-13	2014-01-13	0	-
D29	Final: Web App	C,S,T	2014-01-13	2014-01-13	0	-
D30	Final: Simulator App	C,S,T	2014-01-13	2014-01-13	0	-
D31	Final: Database	C,S,T	2014-01-13	2014-01-13	0	-
D32	Final version, design document	C, S, T	2014-01-13	2014-01-13	0	-

D33	Final product	C	2014-01-13	2014-01-13	0	**-**
D34	Summary Week Report	S, T	-	-	-	R01
D35	Happiness Poll	S	-	-	-	R01
D36	Revision of documents	T	-	-	-	R02
D37	Minutes of meeting	S, T	-	-	-	R03

R01: Should be handed in every Monday 23:59.

R02: Revision of the documents should be done after major changes.

R03: Should be handed in after each full team meeting.

Table 5. *Deliverables*

4.4 Time schedule

The table below displays the working hours planned for all members in the team for the project. Weeks 47 and 48 have reduced total working hours invested because of exams FER part of the project team has to take. Week 52 is Christmas week; therefore the planned working hours are reduced to accommodate for personal time of team members in light of the holidays.

Initials	w42	w43	w44	w45	w46	w47	w48	w49	w50	w51	w52	w01	w02	Total
RG	6	18	20	18	18	18	20	18	20	20	4	10	18	**208**
DK	6	20	20	18	18	22	22	18	20	20	5	5	20	**214**
DP	6	20	20	15	12	22	22	20	22	23	6	10	20	**218**
AM	4	20	20	20	20	20	20	20	20	20	4	12	20	**220**
PR	0	20	20	20	20	20	20	20	20	20	4	10	20	**214**
MM	6	20	20	20	20	6	6	20	20	20	10	16	20	**204**
MMi	5.5	20	20	20	20	5	6	20	20	20	20	20	20	**216.5**
TV	6	20	20	20	20	20	20	20	20	20	8	16	20	**230**
Total	**39.5**	**158**	**160**	**151**	**148**	**133**	**136**	**156**	**162**	**163**	**61**	**99**	**158**	**1724.5**

Table 6. *Planned working hours for each member*

4.5   Project Activities Plan (Gantt chart)

The first project phases (Waterfall model)

The Gantt chart that includes all the activities and milestones related to the project is presented in Figure 1 and Figure 2. We present in Figure 1 all the activities and milestones related to project plan and revision, requirements definition and application architecture (design). Meanwhile, all the main phases regarding implementation are presented in the second part of the Gantt chart shown in Figure 2. An Incremental Waterfall method has been used for making the following project plan. The Waterfall model influence is present in the first phases shown in Figure 1 while the incremental one is more obvious in the last phases (Figure 2).
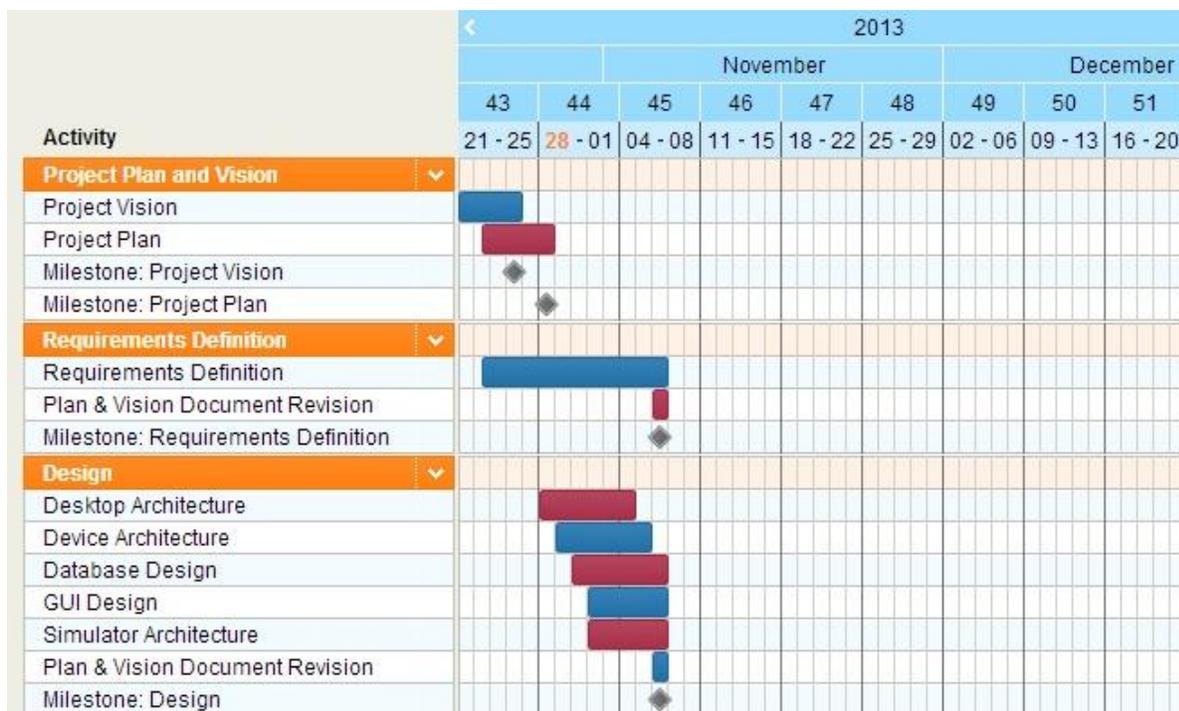
Figure 1:   *Activities for the first project phases*

Regarding the milestones, we already defined them and divided into internal and external. The internal milestones are represented by the red diamonds in the Gantt chart while the external milestones are represented by the gray one. Basically, external milestones are the official ones while internal milestones are related to specific characteristics of our project. For example, concluding the alpha stage is an external milestone. However, some internal milestones such as implementing the web application, device application, simulator and database (alpha version) must be all accomplished in order to fulfill the external milestone i.e., *Alpha prototype* in this case.

Document revisions have also been included as activities since some documentation related to requirements and design will need to be revised while implementing the application.

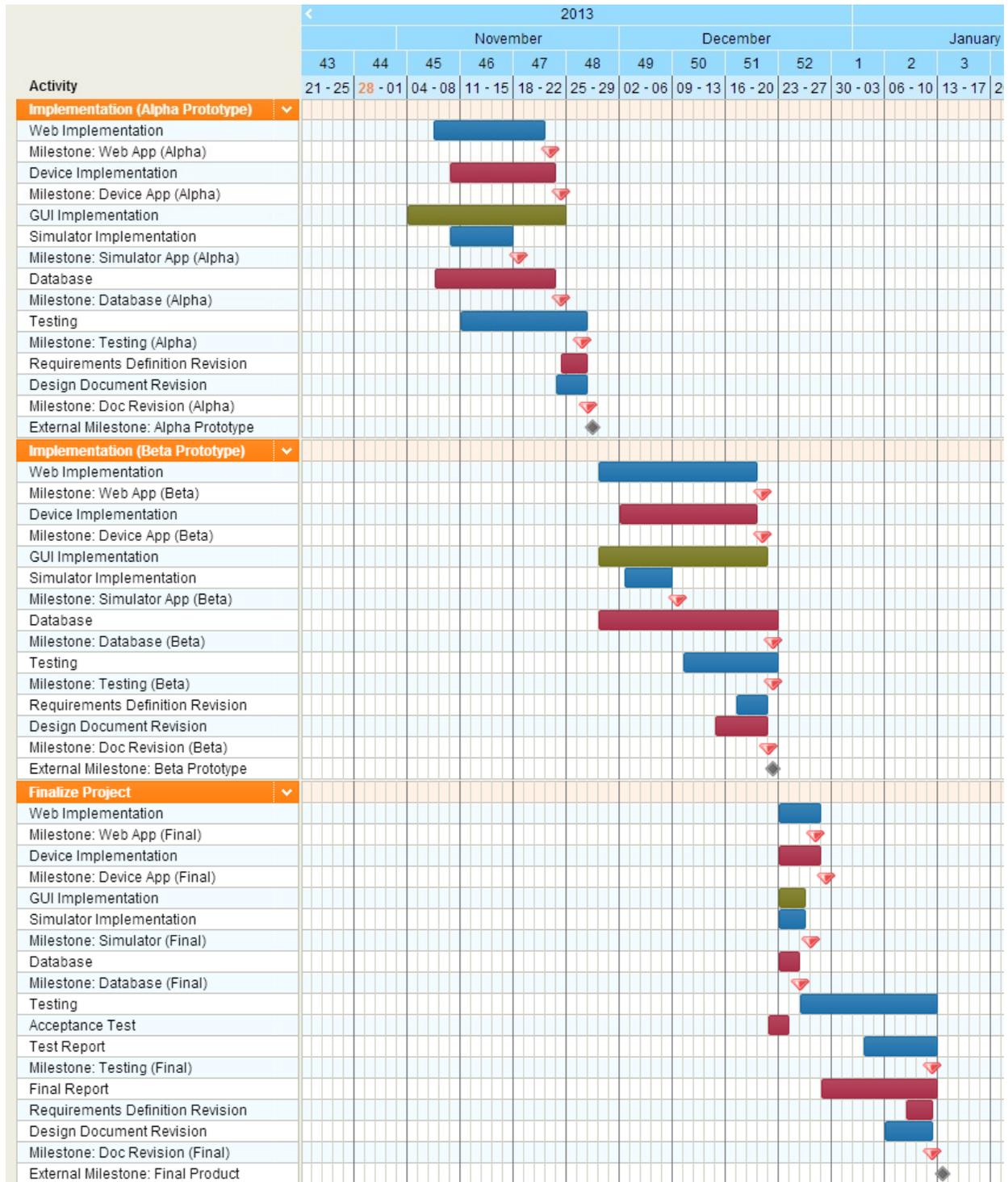## Project implementation phases (Incremental model)

Figure 2: *Activities for the project phases related to implementation*

Quality assurance 5

Primary roles (PM, Design Manager, Document Manager, Testing Manager etc.) have been already assigned to each of the eight team members. This was done in order to make sure that each important process and project development phase can be supervised by one responsible person. That does not imply that the responsible person will perform the whole task. His/her responsibility is related only to supervising continuously the status of the main process or development phase. Moreover, each member will have the opportunity to contribute on each phase of the project.

There will be weekly team meetings (at least twice a week) that will be attended by each team member in order to keep track continuously of the current status of the project.

Sub teams will be created in order to divide tasks e.g., half of members will work on the project plan and the other half will focus on requirements. In the end, members of one sub team can check and give feedback to the work performed by the other sub team. Doing so, the work can be distributed efficiently, meaning that different teams can work simultaneously on different tasks.

Documents will be revised before they are delivered in order to assure the documentation quality. One team member has the role of Document Manager during the whole development process so he can make sure that each document has been written according to proper standards.

The testing phase will be supervised by one team member, who will make sure that the application has been implemented according to the design document and requirements definition. Integration testing will take place in order to ensure that different parts of the application such as different components have been integrated properly in the system and that the system works as expected after those parts have been composited. Acceptance testing will be performed as proof for the customer that the implemented application meets the requirements.

GitHub [2] repository will be used for uploading and sharing source codes. One member is assigned as GitHub manager (or Storage Content Manager).

Project Risks   6

Nr.	Definition of Risk	Resolving the Risk	Possibility
1.	Miscommunication within the group	Improving Communication within the team	Medium
2.	Distribution issues between the group members	Often contacts and consistent communication between the two sides	High
3.	Misunderstanding with the customers	Considerable effort should be put on trying to understand properly the requirements given by the customer.	High
4.	Difficulties on choosing the used technologies	Trying to agree on a technology where most of the members feel confident	Medium
5.	Member(s) leaving project	Make a proper redistribution of the work	Medium
6.	Lack of Knowledge	Specify Learning Activities so each member will have the opportunity to get or improve his own knowledge related to some technologies.	High

Table 7. *List of aware project risks*

1. Miscommunication represents a general risk that influences teamwork in every project. Therefore, we aim to keep the communication between team members consistent and frequent in order to increase the level of cooperation in the team and have a positive impact in the quality of work.

2. The fact that the team members are distributed in two different countries (one in Västerås, Sweden and one in Zagreb, Croatia) has its own risks as well, since not all team members get to have real meetings (in person). However, this issue can hopefully be solved by having group meetings on Skype [1] or Google+ [4] as often as possible so both sides can give feedback for each other's work and get updated for anything that has been added or changed to the current status of the project.

3. Misunderstanding the customers and the requirements provided by them can often cause the failure of the project. Therefore, everything that is not clear regarding requirements should be clarified as soon as possible. This is done by managing to keep the communication with the customers as consistent as possible.

4. The technologies that will be used during implementation have been left as free choice by the customers. The team will choose the technology according to the skills and background of each member. This represents a risk since it is not easy for eight people to agree on selecting the most appropriate technology that should be used during the implementation phase.

5. Another possible risk would be the case when members would leave the group for some reason. This way, the responsibilities and tasks would have to be redistributed between the other members.

6. The potential lack of knowledge in some technologies and programming languages of some members represents another big problem. In this case, it would be better that members clearly specify the area where they do not feel confident. Afterwards, it would be easier for each team member to define the learning activities in order to obtain the necessary level of preparation needed for contributing effectively on the project work.

References 7

[1] Skype   www.skype.com/
[2] GitHub   https://github.com/
[3] Google Drive   https://drive.google.com/
[4] Google+   https://plus.google.com/

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