Project Management Plan for Mobile Banking Application

PA2513-Advanced Software Project Management

The group member's participation in idea creation and report writing is with the following amount of involvement:

Group Member	Idea Creation	Report Writing
Sai Krishna Chaitanya Kotla	33.34%	33.34%
Sai Srilakshmi Kanumuri	33.33%	33.33%
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Table 1: Group member's contribution

1. INTRODUCTION

The demand for smart mobile devices has been tremendously increasing in the past few years. With their most desirable features of virtually instant availability and long battery life, smart phones have emerged as replacement tools for laptops and personal computers [2]. Also, it is very well known that these smart phones, being easy-to-carry, find applications in both work stations and everyday life of people [2]. This revolution in this area of mobile devices has led to growing interest on the part of businesses, where the banks being majorly attracted towards investments in mobility.

This interest of banks towards mobility has led to the emergence of mobile banking. Increasing the customer fidelity and reaching out to large number of potential customers are the main objectives of mobile banking [2]. To achieve these objectives, many banks are launching "Mobile banking applications" into the market. These mobile banking applications, with their exceptional increase in usability, are being recognized as emergent killers in the field of m-commerce applications [3].Most of the banking services are being provided to the customers through the mobile banking applications and the customers can make use of those services by downloading the application and connecting to internet. So, the users do not need to visit the bank necessarily every time, if they require any particular information regarding their bank accounts. Instead, they can retrieve it through the mobile application. Consequently, personal interaction between the customers and bank employees has been greatly reduced [2]. Some of the banking services that can be acquired through mobile banking applications are [1]:

- Bill payments
- Fund transfers
- Remittance
- Mobile balance recharge
- Balance enquiry
- Mini bank statements
- Check book request
- Locate ATMs
- PIN change
- Online shopping and donation

Ease of access to these services through mobile banking applications has greatly reduced the burden of performing transactions. They enable the customers to retrieve the information about their accounts anytime and anywhere irrespective of geographical location [6]. Irrespective of these exceptional benefits, mobile banking applications are still not accepted by many customers. The reason being that these applications are more prone to security issues and they are unable to meet the requirements of the customers. So, there is a need that has to be confined in increasing the adoption of mobile banking applications among the customers.

2. SCOPE

Previous research showed that there are several risks associated with mobile banking applications. Some of them are lack of accuracy, security, reliability, flexibility and uniqueness of existing applications. More specifically, unauthorized access to customer accounts in case of device theft is the major problem while using mobile banking applications. This is the main reason why most of the customers are still not willing to switch to mobile banking applications. As a result, customer trust on mobile banking applications is greatly compromised. On the other hand, there is no mobile banking application which meets the basic requirements of all types of customers and which provides access to all the necessary information. Instead, they are designed and developed to satisfy traditional customers. So, the scope of this project lies in building a mobile banking application which allows all kinds of customers to access, protect and control their accounts as firmly as possible. The features of proposed mobile banking application are designed by collecting the feedback on "customer requirements" from the corresponding stakeholders. The proposed banking application is then developed using scrum agile software development method within the planned duration.

3. OBJECTIVES

The main objectives of this project are:

- Building a mobile banking application which reaches the customer expectations using scrum methodology.
- To identify the features that need to be developed by gathering customer views and their priorities, in order to increase the efficiency and usability of developed application.
- Depending upon task complexity and customer value, estimating the effort required to add each feature using the method of "planning poker".
- Based on the effort that is estimated, divide the tasks into feasible sprints and form the sprint backlog.
- To prepare a project plan which includes the resource allocation strategy and a Gantt chart for developing identified features within the sprints.
- Designing a good quality management plan, so that our mobile application is of acceptable quality to the users.
- To identify the potential risks, their probability of occurrence and their impact on the project. To mitigate the identified risks using mitigation strategies.

In this project, we intend to meet the above set of objectives using "scrum". It is an iterative and incremental agile methodology which uses iterations of fixed duration.

Motivation

The reason behind choosing scrum over other software development methodologies is that, scrum, unlike other traditional software development life cycles (SDLCs) like waterfall model, spiral model, helps the developers in adjusting the scope of the project [7]. Many banks aim to produce the software with minimal costs [5]. But, with frequent change in customer requirements, developing the software using traditional SDLCs has become very difficult [5]. The problems with these traditional models are solved by scrum, which enables us to change the project plan, in order to satisfy the customer requirements. Also, unlike other models where the flaws in the project are identified and rectified at the end, it allows the developers to identify and fix the problems at any particular stage of software development. This reduces the complications involved in developing the software, which thereby helps us in delivering the product within the estimated time. On the other hand, there are several studies which revealed the success of scrum in mobile application development and they have also been the inspiration behind using scrum as our software development method [4].

There are three major roles involved in software development using scrum, they are scrum master, product owner, development team [8]. Since there are only three members available for our project we have divided these roles among ourselves such that each of us will play multiple roles as shown in the table.

Role	Members
Analyst, Tester	Chaitanya
Product owner, Designer	Praneeth
Scrum master, Developer	Sai Srilakshmi

Table 2: Role division among team members

Assumptions

The following assumptions are made before developing the proposed mobile banking application.

- The proposed mobile banking application contains all the features of existing applications like Bill payments, Fund transfers, Remittance, Mobile balance recharge, Balance enquiry, Mini bank statements, Check book request, Locate ATMs, PIN change, Online shopping and donation.
- The proposed mobile banking application confirms to ISO 25010 qualities [11].
- All the team members have previously worked on developing mobile banking applications.
- The proposed mobile banking application can be downloaded from the internet for free.
- There are five working days per week and each day is an eight hour working day. And all the team members follow this work scheme.
- All the necessary resources of the project are available till the completion of the project.
- The restrictions on project budget are minimal.
- The hardware used is reliable and secure.

Work break down structure

A work break down structure is designed to identify the major elements of our project. This work break down structure helps us in deciding whether sufficient estimates are provided at each level of our project and to identify constituent components of the deliverables. It also helps us in verifying the correctness of our project decomposition.

4. STAKEHOLDERS

The identified stakeholders of the mobile banking application are the banks, mobile operators, effective users (who use the banking application very frequently) , naive users, traditional users, payment card networks, mobile device manufacturers, hardware vendors, software development team comprising of requirement analysts, developers, testers, designers, Telecom operators, OS providers, legislative bodies, project management team comprising of project managers, higher management like business executives etc. The identified stakeholders are prioritized and the expectations of key stakeholders along with their potential influence on the project are presented below:

Stakeholder	Description	Expectations	Potential Influence
Effective users	Users who use banking applications very frequently to make mobile payments and access their account information.	Enable the users to personalize the application according to their priorities.	Positive: Adoption and usage of mobile banking application will be greatly increased.
Traditional Users	Users who use mobile banking applications only to make routine payments like monthly bills, mobile recharge etcetera.	They expect the application to have simple structure and limited features.	Negative: They do not use many features provided by the mobile banking application. Due to which, the resources allocated for providing those services are wasted.

Naive Users	Users who does not have basic knowledge about using the application.	Expects the feature of customer guidance which helps them in using the application.	Negative: Improper usage of application may lead to severe financial loss from the user accounts.
Payment card network operators	Dictate whether the debit/credit cards can be used to facilitate the payment process between card users and the banking application.	The mobile banking application should be able to direct the merchant's processor to card operator to proceed with mobile payments.	Positive: Provides easy transfer of funds to the customers. Negative: Failure in identification of card issuer may lead to unsuccessful transactions.
Banks	Organisations which offer mobile banking applications to provide access to their services in an easy way.	Increase in customer fidelity and achieve expected return on investment by launching the mobile banking applications.	Positive: Banks with good reputation helps in increasing the usability of developed product. Negative: If the resources are not sufficiently provided the resultant application may not contain expected features.
Handset manufacturers	Organisations which manufacture the mobile devices and its components.		Positive/Negative: The quality of hardware used in building mobile devices influences the efficiency of resultant application.
Telecom operators	Network providers for the mobile devices in which the application is installed.		Positive/Negative: Strength of the network signal affects the usage and performance of the mobile banking application.
OS providers	Development teams working on different operating systems like android, iOS, blackberry etcetera.		Negative: The mobile application should follow all the guidelines and limitations imposed by the OS providers.
Legislation bodies	Legal representatives and government agencies.	The application should follow the legal norms imposed by the legislative bodies.	Expected features that are not authorized by the legislative bodies cannot be developed.

Table 3: Stakeholders

5. PRODUCT BACKLOG

After determining the objectives of our project and before beginning to develop the software, it is necessary to identify the features that are to be added to the product. These features form our project's product backlog and they are

identified by collecting information about the customer requirements and their priorities. Some of the identified features are enriched communication, compatibility, personalization of application, manage personal information, alerts, manage cards, security, pervasive transaction capabilities and customer support.

It is not possible to build the mobile banking application that contains all these features within the estimated time. So we have prioritized the identified features that are of highest customer importance and decided to work on five main features. These prioritized features are presented to the scrum development team as user stories during sprint planning. The product backlog of our project, representing the description of user stories along with the motivation behind their inclusion is shown below:

Features	Requirement	Description
Security	The users generally like to ensure that their transactions and their information is safe with them.	We have made it, at most importance to ensure the safety of the customers. So in order to ensure the safety of the customers we have added a layer apart from the one-time password. This layer contains finger print scanner. A third layer is also being added to it. In this third layer we ensure that we add the feature of voice recognition. So in order to login to the account it is safer to access this way. Hence we ensure that a maximum security is being maintained for the users.
Compatibility	The customers wants the application to be compatible on all devices.	We make sure that the application is available on all mobile platforms. This mobile application was not only compatible to only certain mobile platform like android, iOS. Instead, it was developed to work on all mobile platforms like blackberry, windows, Firefox etcetera.
Alerts	The user wants to be notified about the new updates in a bank.	We have made it a point to alert the users regarding the new services provided by the bank. We also try to alert them regarding the balance available in their accounts and availability of loans. We also see that an alert is being generated every time a withdrawal is being done.
Managing lost cards	The user wants to manage the lost cards immediately from the application.	If the user tends to lose his debit or credit card, he can directly block the card from the developed application. Instead of going through the long process of calling the bank employees and blocking the card. He can easily block it by logging into the application on the phone. This way the user can save a lot of time.
Customer support	They expect the application to be user friendly.	We try to take the feedback of the customers on our application so that we can constantly update the application according to the needs of the user. We have also added a separate column which helps the user in using the application. So this way there is a constant scope for improvement in this application.

Table 4: Product Backlog

Furthermore, all the above user stories are divided into subtasks as shown in work break down structure (WBS) presented in Appendix B. The scheduled plan for completing these sub tasks is represented in the form of Gantt chart in Appendix C.

6. SPRINT BACKLOG

The developed mobile banking application with the designed product backlog is released in three sprints. The features in the product backlog are distributed between these three sprints depending on the priority of stakeholders and the effort required. The available human resources of the project are allocated the roles of developer, designer and tester. The resource allocation for all the three sprints is presented in Appendix A [10].

Sprint 1

Sprint planning

In this phase, the scrum development team performs effort estimation for all the user stories. The effort is estimated as number of person hours using the method of planning poker [13]. The key factors that are taken into consideration while estimating the effort are level of complexity of each user story and its corresponding customer value. The members of the project are each assigned the roles of representing the designer's, developer's and tester's perspectives and resultant effort is estimated for each user story.

The following table represents the effort estimated for each user story:

User stories	Complexity	Customer value	Estimated Effort(Person-Hours)
User story – 1	HIGH	HIGH	187
User story - 2	HIGH	MEDIUM	146
User story – 3	MEDIUM	HIGH	115
User story – 4	MEDIUM	MEDIUM	100
User story – 5	LOW	MEDIUM	85

Table 5: Estimated Effort using Planning poker

One of the major features of agile software development methodologies is identifying the features that are of maximum complexity and deliver them as quickly as possible [7]. This is because of the reason that, failure in delivering these features may lead to budget over runs and thereby causing customer dissatisfaction. So, depending on the estimated efforts for all the user stories, user stories 1 and 2 are selected to be developed in the first sprint. These user stories focus on providing maximum security to the customer accounts and increasing the compatibility of developed mobile banking application. This sprint starts on October 17 2016 and ends on November 6 2016.

The following schedule represents the plan for the current sprint

- Planning sprint schedule – 1 day.
- Designing and Developing User story 1- 3days.
- Designing and Developing User story 2- 3 days.
- Testing done on User story-1 and User story-2 – 3 days.
  Integration – 2 days.
- Quality assurance – 2 days.
- Sprint Review and Sprint Retrospective meetings - 1 day.

Due to high level of complexity and high customer value, the user story 1 is developed first which is then followed by development of user story 2. The number of working days for this sprint are 15 days, excluding 6 days for the weekends.

Daily scrum meetings

A meeting is being held at the end of each day for 15 minutes. In this meeting we try to solve the issues that have arisen during that day and we try to modify the plan if necessary for the coming days. We also try to ensure that we are on time for delivering the product. We make sure that we note down the progress we have made during that day and accordingly prepare the burn down chart which is presented in Appendix D [9].

Sprint Review meetings

At the end of each sprint we organize a meeting so that we come to know how far we have come in developing our product. In this meeting the customer representatives, stakeholders and product owner are involved. We try to show them how far the progress has been made in developing the product. We also take opinions from the people present in that meeting and try to improve on them.

Sprint retrospective meetings

After every review meeting we organize a self-analysis meeting. The product owner and the scrum development team are involved in this meeting. The shortcomings of the current sprint are analysed and changes will be proposed to increase the efficiency of activities involved in the next sprint.

Sprint 2

In this sprint, the user stories 3, 4 and 5 are selected to be developed. These user stories focus on informing the customers regarding various bank services in the form of alerts, allowing them to post their feedback on the application and manage their lost cards in case of theft.

With this, the planning for sprint 2 comes to an end and the implementation of three-week sprint 2 begins. This sprint starts on November 7 2016 and ends on November 27 2016.

The following schedule represents the plan for the current sprint

- Planning sprint schedule – 1 day.
- Designing and developing User story 3 – 2 days.
- Designing and Developing User story 4 – 2days.
- Designing and Developing User story 5 – 3 days.
- Testing is done on User stories 3, 4 and 5 – 2 days.
- Integration – 2 days.
- Quality assurance – 2 days.
- Sprint Review and Sprint Retrospective meetings – 1 day.

Depending upon the level of complexity and customer value for the user stories, user story 3 will be developed first, followed by user stories 4 and 5. Like sprint 1, the number of working days for this sprint are 15 days, excluding 6 days for the weekends.

The Daily scrum meetings, Sprint review meetings and Sprint Retrospective meetings follow the same structure they are held in sprint 1.

Sprint 3

This is a two-week sprint which starts on November 28 2016 and ends on December 9 2016. The number of working days for this sprint are 10 days, excluding 4 days for the weekends.

In this sprint, all the developed user stories are tested to verify if they are working as expected or not. All the bugs in the developed user stories are fixed and the developed application is tested for quality.

The following schedule represents the plan for the current sprint

- Re-evaluating User stories – 5 days
- Quality assurance – 3 days
- Final Sprint Review meeting – 1 day
- Release of the product – 1 day

The Daily scrum meetings, Sprint review meetings and Sprint retrospective meetings follow the same structure they are held in Sprint 1 and Sprint 2.All the flaws identified during these meetings are rectified and the developed mobile banking application is released on the planned date.

7. GANTT CHART

The timeline which we have set for the three sprints involves lot of functioning like developing, designing and testing. We develop a prototype for the users and make sure that it satisfies the users according to their needs. This prototype is being designed according to the user story priorities which we have set.

User story-1: Security
-- Initial layer consists of one-time password.
-- Secondary layer consists of finger print scanner.
-- Third layer consists of voice recognition.
User story-2: Compatibility
-- We ensure that it is compatible on all mobile platforms.
-- If we tend to see bugs in the application we try to fix them and make it compatible on all platforms.
User story-3: Alerts
-- The users will be notified about the transactions being carried out regularly.
-- They will also be notified if there are any new updates available.
-- The users will be alerted in advance if they are due on credit bills and loans.
User story-4: Managing lost cards
-- If there is a loss of card then it must be blocked immediately.
-- It can be done directly from the application we developed.
User story-5: Customer Support
-- The developed application is passed on to the users and we make sure to take their feedback.
-- If any flaws are tend to be found in the developed application we try to rectify it.
-- We also try to improve the application according to the user point of view.

8. RISK MANAGEMENT

Risk management is the process of identifying, analysing, controlling and managing the risks involved in a project [12]. Scrum methodology does not give any information about how the risks of a project should be managed. So, there is a need to design and follow a particular risk management scheme which helps us in mitigating the potential risks of our project [12]. We identify the risks for the product and make sure that they are being mitigated. We have subdivided our risks into four categories. They are low, moderate, significant and high risks. We divide our risks into these categories and prepare a risk mitigation strategy catalogue.

- High Risk(H) - greater than 70%
- Significant Risk(S) - 50 to 69%
- Moderate Risk(M) - 25 to 49%
- Low Risk(L) – less than 25%

Risk	Occurrence	Impact	Mitigation
Conflict of interests among team members	L	L	The team has already worked together before so there won't be much of a problem, even then if the conflicts arise the scrum master deals with the conflicts.
Over running of the cost	S	H	By estimating the effort and allocating the resources in a planned way we could mitigate this risk

Unrealistic schedules	M	S	By estimating time using planning poker we could mitigate this risk
Misunderstanding of users opinion	M	H	Proper communication between the user representatives and scrum team ensures in reducing the risk.
Unable to reach the quality standards set by the users.	M	S	Quality assurance is being checked so that we can maintain the proper quality of our product.
During the review meetings, lack of communication among team members	L	L	During every meeting, the scrum team members are given a chance to express their views to ensure proper communication.
Availability of team members on each working day	L	L	The risk is mitigated without much effort because the scrum teams are generally self-motivated.
Stability of the application	S	H	By constant testing during each and every sprint, we ensure that application stability is being maintained.
Risk of finding flaws in the final stage leading to the delay of the product	L	M	A thorough testing is being done at the end of each sprint so the flaws are identified before itself.

Table 6: Risk mitigation

9. QUALITY CRITERIA

In order to make sure that our product is of top quality, we ensure that a proper quality management procedure is being followed. Quality criteria is subdivided into three categories quality planning, quality assurance and quality control. We have considered quality assurance process for our product because we set some standards and it is being developed according to those standards.

Quality assurance

We try to identify which quality standards are suitable for our application. We develop an application which is under the bank regulations and which is suitable for the bank standards. All planning and implementation is being done in such a way that it would satisfy the required quality standards. Internal quality assurance is also being done on the project management team. We try to do a test driven development so that the quality is being ensured.

- **Suitability** - In suitability we check the correctness and appropriations.
- **Efficiency** - It is being measured according to functional capacity and the behaviour of time.
- **Compatibility** - We make sure that it is compatible on all the platforms.
- **Usability** - We check its operability and accessibility so that users don't have a problem while using the application.
- **Reliability** - We have made it reliable by ensuring that application is available on all platforms and by enhancing the security features.
- **Security** - Authenticity of the users is checked and confidentiality of the users is also maintained.
- **Maintainability** - We ensure that the application is modifiable, reusable and testing can be done without any problem. Hence the application is maintainable.

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APPENDIX A

RESOURCE ALLOCATION FOR SPRINT 1, SPRINT 2 AND SPRINT 3

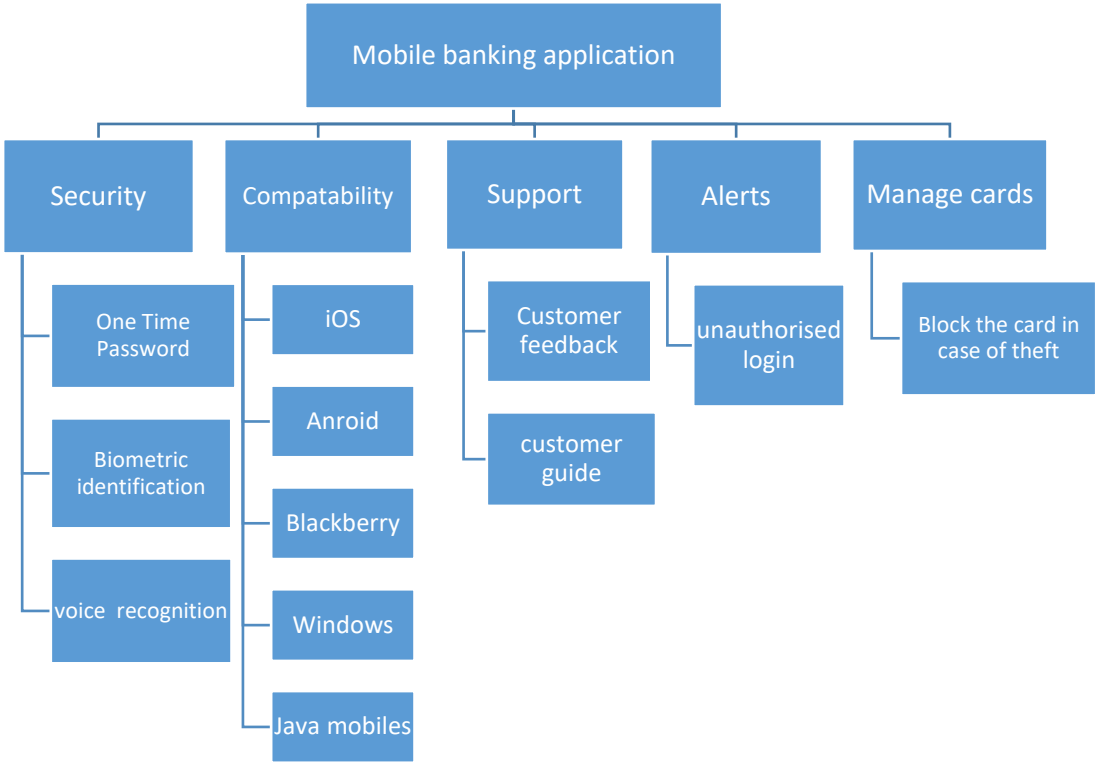
Activities	Resource Allocation
I. Initial Planning a. Project scope and object definition	Tester Developer Designer
II. Product backlog Creation a. Prioritization of tasks	Tester Developer Designer
III. Sprint-1	
Sprint planning a. Effort estimation using planning poker, customer value and complexity factors	Tester Developer Designer
1. Developing and designing an application for task - 1	Developer Designer
2. Developing and designing an application for task – 2	Developer Designer
3. Testing task-1 and task-2 test cases	Tester
Integration	Tester Developer Designer
Quality assurance	Tester
Review and self-analysis meetings	Tester Developer Designer
IV. Sprint-2	
Sprint planning a. Effort estimation using planning poker, customer value and complexity factors.	Tester Developer Designer
1. Developing and designing an application for task-3	Developer Designer
2. Developing and designing an application for task-4	Developer Designer
3. Developing and designing an application for task-5	Developer Designer
4. Testing tasks 3,4 and 5 test cases	Tester

Integration	Tester Developer Designer
Quality assurance	Tester
Review and self-analysis meetings	Tester Developer Designer
V. Sprint-3	
1. Re-evaluating task priorities	Developer Designer
2. Quality assurance for entire application	Tester
Final review meeting	Tester Developer Designer

Table 6: Resource Allocation

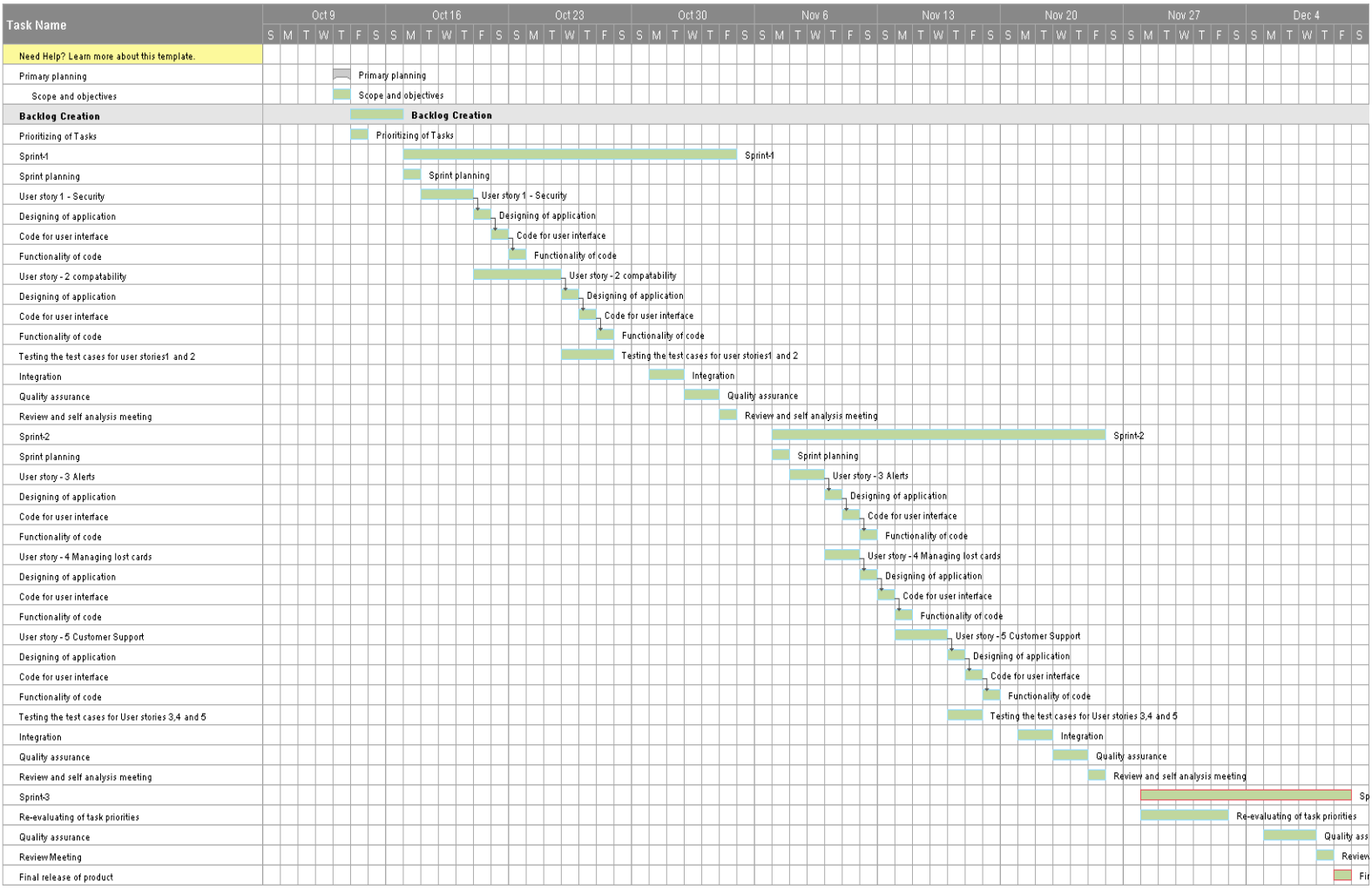
APPENDIX B

WORK BREAKDOWN STRUCTURE (WBS)



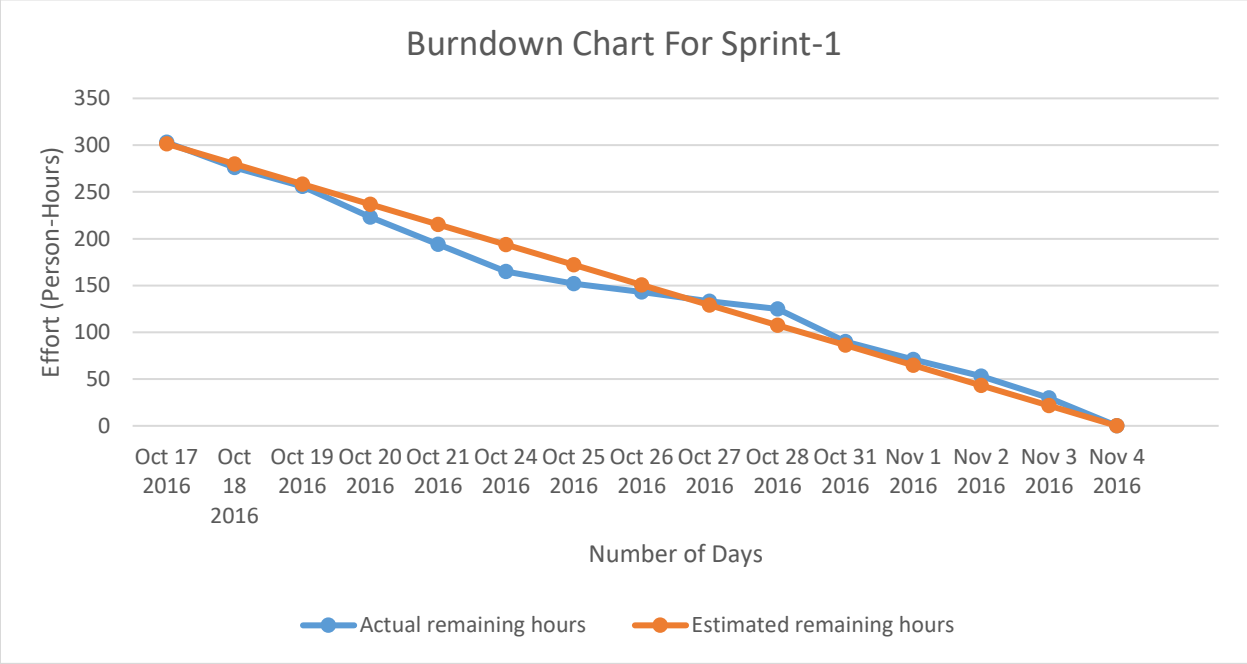
APPENDIX C

GANTT CHART



APPENDIX D

BURNDOWN CHART FOR SPRINT – 1



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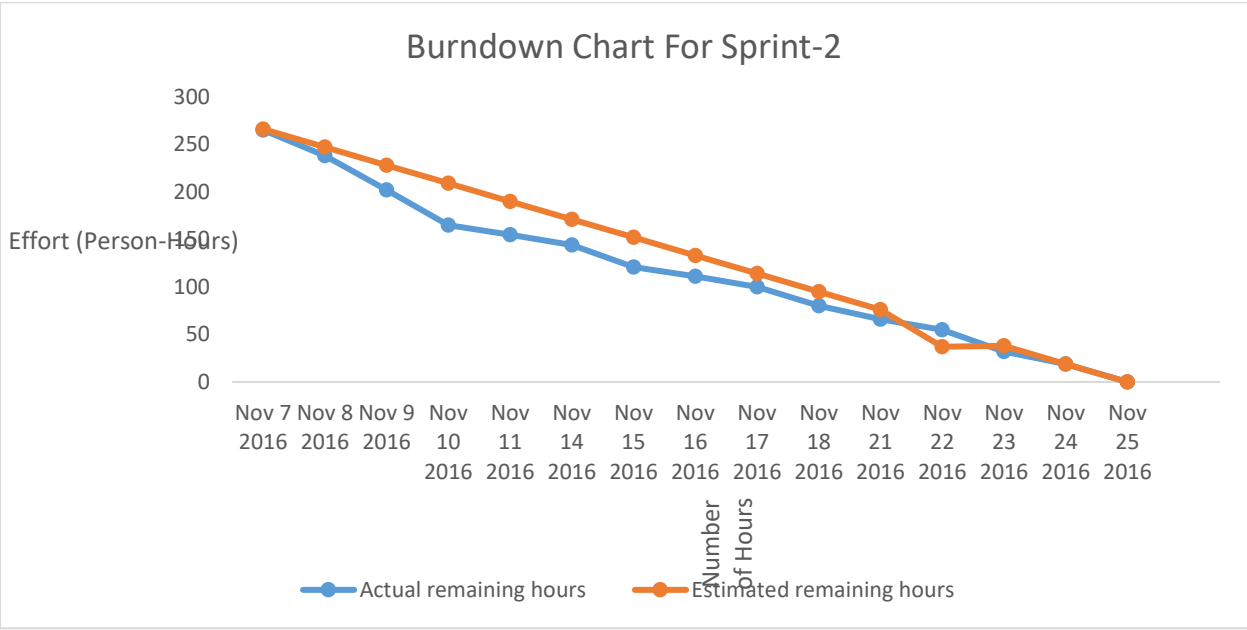

BURNTDOWN CHART FOR SPRINT – 3