

Project management plan
Team 24
Applied software project management

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OVERVIEW

The success of a project mainly depends on a good project plan. This report presents the project management plan for “Online shopping system”. The project started with a kick-off meeting on 6th February consisting six members.

Our “Online shopping system” aims at selling various products like clothes, bags etc. The purchasers can select the required product and place the order. The particular order is placed and the payment is done online. Then the product is delivered to the purchaser address.

The main motivation behind choosing this system is that it modernizes the traditional way of shopping. This way of online shopping is easy and comfortable when compared to the traditional way of shopping. There is no doubt that online shopping will be very comfortable for busy people. We can browse and search for any item we want from any location. It eliminates the action of going out to local stores in person for a purchase during their hours of operation. Online shopping makes the products easy to find, and it saves a lot of time and energy. Online shopping allows privacy and it's easier to find rare products.

1. Scope of the project

The online shopping system is designed in order to provide a user-friendly interface. The homepage provides the overview and the features of the application. The home page should contain the links for available categories, login page, register page, cart page, help and about us page. On selecting the available category, the list and links of available products of the selected category must be shown. On selecting a particular product, it must be redirected to the product page which contains product details. The cart page should contain the details of the products selected by the user. The user also must have the choice to modify the cart items and then proceed to order. Once the user proceeds to order, it is redirected to order page which provides the payment selection, date of delivery. Once the payment is done the product is delivered to the purchaser address.

2. Goals and Objectives

- **Goals:**

The main goal of our project is to develop a web application with better work performance. Also, in addition, provide a modernize and easy way of shopping when compared to the traditional way of shopping to the users.

- **Objectives:**

In order to achieve the project goals, the following objectives are to attained:

- a. To provide an overview of our software project.
- b. Team co-ordination, clear roles and responsibilities.
- c. To select an appropriate software development methodology relevant to our project.
- d. Identifying requirements and presenting the product backlog.

- e. Effort estimation for the tasks.
- f. To monitor and control the plan and respond to any deviations.
- g. To identify the risks, applying mitigation and monitoring strategies.
- h. To identify the tasks that ensure quality.

3. Assumptions

Assumption no.	Description
1	Each team member performs specific roles and responsibilities as assigned.
2	All the team members are expected to participate and no member shall leave in the middle.
3	There may be change in requirements depending on situations as the project proceeds.
4	All the tools that are to be used in the project are open source tools and does not require any additional costs.

4. Constraints

Constraint no.	Description
1	Every team member need to work for 70 hours.
2	The project is to be completed within the scheduled time.
3	Every team member has to take part during development.

DEVELOPMENT METHODOLOGY:

The development methodology selection is one of the key aspects of the software projects. Development methodology is described as the set of activities that performed at each stage of software development. Development methodology should be selected based on the type of the project and team. We are going to develop a web application that has a scope for changing in requirements and should be changed for user satisfaction. For the development of this project, we have a group of six members which was considered as a small team. The project was small as it should be expected to complete within in six weeks. Considering all these characteristics we have chosen scrum methodology was the appropriate development methodology for the project.

The reasons for selecting this development methodology stated below:

- The scheduled project should be completed within a short duration of six weeks with strict deadlines. Scrum methodology is applicable for developing short term projects.

- The requirements for this application are not consistent and the application needed to be updated for the user satisfaction, for these type of projects agile methodologies like scrum was convenient.
- Scrum suits well for the small and medium projects. Since this project has the small scope the scrum methodology is applicable here.
- Scrum is very appropriate for the projects that developed in small teams. Our team consists of six members which were quite small.
- Scrum methodology works well for the teams working in the same location. Our team was not dispersed here which makes suitable for this project.
- To obtain high user satisfaction, agile methods like scrum was used. The proposed application must require high user satisfaction since it was an e-commerce website.

Teams while working in scrum consists of three important roles. They are product owner, scrum master and scrum development team. In scrum methodology, some activities like creation of product backlog, sprint planning, the creation of sprint backlog, conducting scrum meetings, review meetings and retrospective meetings are included in the development process. Here the project was divided into two sprints with a duration of three weeks for each sprint.

TEAM ORGANIZATION

Team Member ID	Name	Skills
GM01	Divyani Pamulapati	Documentation, HTML, CSS
GM02	Junwen Zhao	Database systems, JAVA, HTML
GM03	Luyang Xu	HTML, CSS, JAVA
GM04	Maheshwar Kota	Communication, HTML, CSS, JAVASCRIPT
GM05	Shravani Nelapudi	Documentation, JAVA, Management
GM06	Thejendar reddy Koppula	Documentation, HTML, JAVASCRIPT, Team management

Table 1: team organization

ROLES AND RESPONSIBILITIES

The team consists of six members for developing this project. Roles were decided and distributed among the team members based on the skills of each team member that

assessed on the kick-off meeting which was conducted on 6th February. The three major roles in scrum teams are scrum master, product owner and scrum development team. Since all the members have multiple skills, responsibilities are assigned to make use of their skills.

Roles	Team member ID	Responsibility
Scrum master	GM05, GM06	Role of scrum master in each sprint.
Product owner	GM04	The role of product owner and the role of developer.
Scrum development team	GM01, GM02, GM03, GM05, GM06	Role of developers, designers and testers

Table 2: roles and responsibilities of team members

A detailed description of the roles and responsibilities were stated here:

- *Scrum master:*

We rotate the role of scrum master for each sprint among group members GM05 and GM06. The scrum master is the connection between the stakeholders. He is responsible for the correct implementation of the process. He acts as a facilitator. In this project after every sprint, the scrum master changes and all of them are also responsible for development due to resource constraints.

- *Product owner:*

GM04 takes the role of product owner in this project. He was responsible for understanding the user requirements and prioritise these requirements in the product backlog. He is responsible for building and managing the product backlog. due to the resource constraints, the product owner is also responsible for developing the front-end of our application.

- *Scrum development team:*

- Designers:* All the team members in the group are responsible for the user interface design. The moqups tool will be used for designing the user interface.
- Developers:* Due to the resource constraints all the six group members are responsible for development. GM01, GM04 and GM06 are responsible for developing the front end. GM02, GM03 and GM05 are responsible for developing the backend in our application. The languages used in the front end are HTML, CSS and JavaScript. Languages used for developing the Backend are Java and SQL.
- Testers:* Testers are responsible for testing the product like unit testing, integration testing and user acceptance testing. selenium tool was expected to use for testing this web application. GM03 and GM06 are responsible for the testing in this project.

PROJECT STAKEHOLDERS

The individuals or organizations who are actively involved in a project and affected by the outcome of the project are considered as the stakeholders of the project. The potential stakeholders identified for our e-commerce website are:

- Customers
- Investors
- Marketing team
- Project development team

REQUIREMENTS

Requirements are the descriptions of the features that should be provided by the developed software product. The product owner is responsible for identifying the requirements from the users, investors and development team. There are two type of requirements. They are functional requirements and non-functional requirements.

- **Functional requirements:**
Functional requirements for a software product describes the functionalities that performed by the software product. The main results that user expects from the software are executed by functional requirements. In the table below, we listed all the functional requirements for users and admins with unique requirement ID.

Requirement ID	Description
Functional requirements for users	
R01	E-commerce web application
R02	Display products in home page
R03	Add/ delete /view product in shopping cart
R04	Successful register
R05	Successful login
R06	Display order list/ order details
R07	Payment/ submit order
Functional requirements for admin	
R08	Successful login
R09	Delete or update the products

Table 3: functional requirements

- **Non -Functional Requirements:**

Non-Functional requirements refer to system attributes such as Usability, Security, Reliability, Maintainability. Failed to meet anyone of this can result in loss of internal business, users trust and markets demands.

As our project is on web application development we defined the above four important attributes as follows.

- *Usability:*

The team should prioritize the important functions of the system based on usage patterns and frequently used functions should be tested for usability to decrease the complexity and critical functions by creating the requirements specifications in the beginning of the project.

Here, for our project usability refers to attributes like look and feel of the web page. The user satisfaction can be increased by facilitating credentials like user-friendly, faster understandability of application features and how easy to use the application.

- *Security:*

Security for web pages is restricting access depending on the certain properties of user and functions to be used.so it should be addressed in the development of any product. Mechanisms such as threat modelling, risk analysis, static analysis and digital signatures should to be included.

Here, for our project security refers to the providing user an assurance in using their accounts effectively and avoid the hackers to manipulate the user's data and misuse of authentication credentials.

- *Reliability:*

The reliability of the system depends on its behaviour consistently in a user acceptable manner when operating within the environment for which it was intended to use.

Here, for our project reliability refers to enhance the product to work on different web browsers and increase browser compatibility irrespective of the technologies used to develop the application.

- *Performance:*

The response time measured for the user inputs for the web application gives an idea about the performance of the application even at peak times when a load of the system is usually high.

To our project, performance as a non-functoinal requirement is necessary for website responds within the expected time for the user inputs and work effectively by providing the user's satisfaction to use.

- *Maintainability:*

Every system needs to be cost-effective to maintain and to be developed with in budget. Maintainability requirements may cover diverse levels of documentation by which test cases and test plans will accompany the system.

As our project is a web based application there would be always modifications and certain changes to be done as per user requirements to the system. Since it is a constantly evolving application the team should be aware of accommodating these changes and for effective maintainability.

PRODUCT BACKLOG:

The product backlog consists of all the features that shall be done in this project. The product owner is responsible for the product backlog. The product owner stores the user stories contributed by the stakeholders in the product backlog.

User story	Feature ID	Feature	Description
As a user, I want to see all the features available.	F01	Home page	The homepage provides the overview and the features of the application. The home page should contain the links for available categories, login page, register page, cart page, help and about us page.
As a user, I want to see different products available within each category.	F02	Categories page	On selecting any available category in the home page, the list and links of available products of that particular category should be shown.
As a user, after selecting any product I want to see product image and details of the product like price and size.	F03	View product page	Selecting of any particular product should redirect to the product page which contains product details.
As a user, I want to view the cart page where I can see the items that can be edited or proceed further to place an order.	F04	Cart page	The cart page should contain details of the product selected by the user. Here the user has the choice to modify his cart items and proceed to order.
As a user, I want to pay for the	F05	Order page	The user redirects to order page once he proceeded to make

selected products that ordered.			an order. This page provides the payment selection, date of delivery
As a user, I want a register and login that authenticates me to the web-site in order to make orders.	F06	Register/ login page	Register page provides the user for registering for the application. The login page provides the login option to the existed user.
As a user, I want to have a help option to know how to use the application and contact details of the company for questions and emergencies.	F07	About page	This page provides the user guidance for understanding the features of our application and contact details of the company.
As an admin, I want a login page that authenticates me to control page.	F08	Admin login	This page provides the login for admin which redirects to admin control page.
As an admin, I want to add or delete the product details based on the availability	F09	Admin control page	Here admin can modify the details of items based on the availability.

Table 4: Product backlog

EFFORT ESTIMATION

After the completion of identifying requirements from the user stories, a product backlog was developed. The product backlog consists of all the user requirements that are stored in the form features. After defining the product backlog the team was prioritized these features according to the complexity involved in this.

In the below table it provides the information regarding this:

Feature ID	Complexity
F01	Medium
F02	Medium
F03	High
F04	High
F05	High

F06	Medium
F07	Low
F08	Medium
F09	High

Table5: complexity assumed for product backlog

By assuming the complexity and importance of the features in the product backlog we have chosen critical features like F01, F03, F04, F09 for implementing in the first sprint. We further proceed to estimate the effort required for each feature that selected in the sprint 1. Planning poker technique was used to estimate the effort for the product backlog. The planning poker technique was very simple. It works best for the agile methodologies like scrum. Since we are not distributed team, the estimates attained are highly accurate. Effort estimation with the planning poker also saves time. In this busy schedule this is very helpful to get a consensus.

In our planning poker, product owner GM04 describes the feature to the team members and every individual given their estimates after it. The final estimated efforts are recorded after getting into consensus among the group members.

User stories	GM01	GM02	GM03	GM04	GM05	GM06	Consensus
F01	34	21	34	34	21	21	21
F03	55	34	34	34	34	55	34
F04	89	55	89	89	55	89	89
F09	34	55	34	55	55	34	55
Total estimated effort							199

Table6: estimated efforts for selected features

The estimated effort required to complete the features in the first sprint takes 199 hours. The total time that was expected to work in each sprint is about 220 hours. The remaining person hours are used for planning the project, scrum meetings, status meetings and documentation for management plan and status reports. The effort estimates for the further sprint which includes the features F02, F05, F06, F07, F08 were made during the sprint planning meeting of that sprint after analysing the progress of the project in the initial sprint. By this it will improve the accuracy of the estimates which helps for better planning.

WORKPLAN

Major deliverables:

- In this project, the major deliverable was to hand over an e-commerce web application that functions with all the mentioned features, to the customer representative after successfully completing on 22nd march 2017.

Selected development methodology for developing this project is scrum methodology, so the development of the product was delivered in sprints. The product was decided to complete in two sprints where each sprint is planned for three weeks.

▪ **SPRINT-1:**

In the first sprint, all the team members were started to work together on the project. Roles and responsibilities are assigned to each member after the individual assessment of personal skills. A sprint planning meeting was conducted initially to identify the product backlog, estimate efforts for the features in product backlog and sprint backlog was defined based on the complexity of features in the product backlog. The team decided to develop the features like home page, product page, cart page, and admin control page in the first sprint. So, the main activity of this sprint was to implement these features. Some of the other major activities in this sprint are identifying the requirements for the product, defining product backlog and sprint backlog, conducting regular scrum meetings, identifying all the potential risks and their mitigation strategies, quality assurance plan. This sprint planned to start on February 8 and complete on February 27.

Resources were allocated in the sprint with 3 front-end developers and 3 back end developers. Group member GM06 is the scrum master for this application.

Regular scrum meetings:

We planned to conduct the scrum meetings regularly during this process. The intention of conducting these meetings was to determine the progress of tasks. During this meeting, every team member explains their progress of the assigned individual tasks since the previous scrum meeting, expected progress until next scrum meeting and issues that preventing their progress in completing that task. Scrum master records the data given by the team members. This will help the team to be focused on the task and helps in understanding the effort of every individual that will be stated in burndown chart.

Sprint review meeting:

After the completion of the sprint-1, a sprint review meeting was conducted on 28th February 2017. In this meeting, the development team was expected to deliver their work that was done in the concerned sprint. The main motive of this meeting is to identify the progress of that sprint and feedback was collected for the further improvements. The leftover work in this sprint was identified and that should be expected to complete in a future sprint.

▪ **Sprint-2:**

In this sprint, the remaining feature are going to developed. This sprint was expected to begin on 1st March 2017 and complete on 20th march 2017. The feature like categories page, order page, register/ login page, admin login page and help/contact pages were expected to implement in this sprint. Sprint plan was expected to accommodate for the tasks in case of any leftover work in the previous sprint. In the sprint planning meeting,

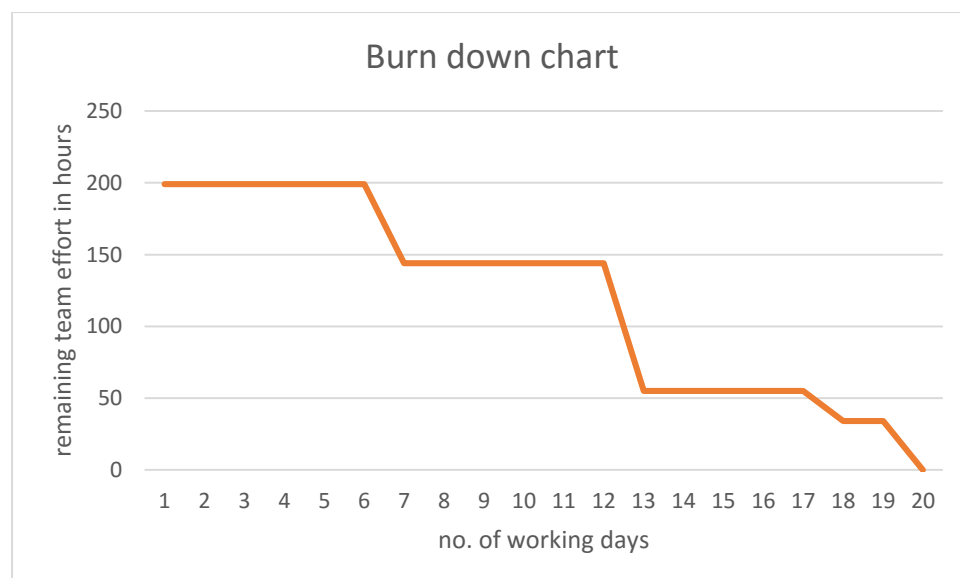
the effort estimations were made after analysing all the remaining tasks and planning was scheduled.

Resources were allocated in the sprint with 3 front-end developers and 3 back end developers. Where GM05 will be the scrum master. Regular scrum meetings are conducted in this sprint. After the completion of this sprint, a sprint review meeting was conducted on 21st of March 2017.

If everything works well according to the plan, the project shall be expected to submit to the customer representative on 22nd March 2017.

Burndown chart:

In this burndown chart we have the estimated effort for the current sprint-1. We will update the actual effort daily during the process.



RESOURCES AND ALLOCATION:

In the below table, it lists the various software's and open source tools that are going to use in this application. The group members and software's are important for the software development. These tools are selected by the group members.

Softwares	Team members involved
GitHub	All team members
Microsoft word	All team members
Microsoft excel	All team members
Trello	All team members
MySQL	GM02, GM03
Jdk	GM02, GM03, GM05
Google drive	All team members

Slack	All team members
Moqups	All team members
Selenium	GM06
Doodle	all team members

Table7: resources and allocation

Here we will use Git Hub for sharing the code, Microsoft word and excel for documentation, Trello for tracking the project, MySQL for database, jdk for development, google drive for sharing files, slack for communication, selenium for testing, moqups for designing and doodle application to plan the meetings.

MONITORING AND CONTROL PLAN

- *Requirements Control Mechanisms:*

Even though the team itself is the customer of the product and the requirements are fixed but there should be always new plans for accommodating the changes suggested by a customer that we have discussed in milestone meetings. Effective tools should be used to pertain the changes and a timetable can be updated with new information accordingly.

- *Regular Scrum Meetings:*

Group meetings take place in between the team members to track the progress of the project and asking for ideas and sharing them to improve the development strategies to achieve a quality product. In our project scrum master will be responsible for organising and scheduling the meetings. Some group meetings are taken by group video conferences by using social networks like skype, in the absence of team members who are unable to attend meetings or unavailable during the project.

Objectives of regular scrum meetings:

- Scrum masters schedules the group meetings.
- Every team member should show their progress of their assigned tasks.
- Any significant issues faced by team members should be discussed and should come up with alternative solutions.

- *TRELLO:*

For this project, we are using Trello an online tool to track and monitor the tasks. By this, we can give a description of the task to be completed, estimation schedule of task completion and task remaining. Here we can also list out the participation of individuals work and their progress.

- *Status Meetings and Status Reports:*

These status meetings help us to track our progress and to get a valuable feedback from our product owner if any changes are required in the project plan implementation. Here the product owner also analyse the contribution of team members to the project. Status reports give feedback about the completed tasks and analysis our progress and any significant issues faced also reported.

Generally, this status reported are reviewed by all team members and submitted in its learning for assessment.

- *Burn Down Charts:*

Burn down charts are used to track mechanisms used in the scrum. A burndown chart is a graphical representation of the work that left in their sprint. It is useful in predicting when all the work will be completed and also represents the completed work to the consensus estimate. For our project, we are using burndown charts to depicts the work progress and also to monitor and predicts the completion of tasks.

- *Communication Control:*

Effective communication is a dominant factor in a success of scrum project. Identifying and using the specific communication tool plays a vital role to share the ideas of the team, In our project, we used to doodle and slack for general schedulings and meetings and skype to discuss the project and GitHub to share the code.

RISK MANAGEMENT PLAN

Implementation of the Agile methodology itself a risk mitigation strategy. However, the risks still occur in the project. The project team is responsible for identifying and monitoring these risks. Risks are assessed in the initial stage of the project but and also assessed as the project proceeds. In every daily scrum meeting, time allocated for risk management. In the allotted time the new risks are identified and the current risks are assessed. Risks are identified and monitored in every sprint. These are some of the risks identified initially in our project and their mitigation and monitoring strategies.

Risk ID	Risk	Mitigation Strategy	Monitoring Strategy	Impact	Probability
1	Risk of language, cultural clashes between the team members	As the teams are assigned randomly, people of different cultures and countries are grouped together. It is necessary to overcome language and cultural barriers. Conduction of daily meetings	Making sure that everyone understands each other's ideas, acceptance of ideas is compulsory. Encouraging each other's ideas helps in monitoring this risk. Common terms are used to reduce the complexity.	High	Medium

		and identifying individual skills of each person, using a common terminology without misinterpreting each other's ideas and terms helps in mitigating this risk			
2	Risk of scope creep due to emerging requirements	Assigning clear roles and responsibilities at the initial stage of the project helps in mitigating this risk.	Any changes in project scope should be approved by the product owner.	Medium	Medium
3	Risk of inadequate design	Ensuring required and better design work done before starting the development.	Breaking down each feature into a set of tasks during the sprint planning meeting helps in monitoring this risk.	Medium	Low
4	Risk of delay in delivery of the prioritized feature in the particular sprint	This risk can be mitigated by re-prioritizing the requirements in the product backlog list.	By keeping track of the sprint burn down charts, which give a clear overview of the sprint status.	High	Medium
5	Change in requirements	Immediate modification in the sprint plan helps in mitigating this risk.	Spending enough time for requirement elicitation helps in monitoring this risk	Medium	Medium
6	Absence of the team member	This risk can be mitigated by making preventive plans, re-scheduling. Also if the missing team	By informing prior about the absence of the team members so that they take alternate measures like assigning tasks to	Low	Medium

		member wishes to work by distance, facilitating video conferences using online communication tools to the unavailable team members	another team member		
7	Risk of inaccuracy due to unrealistic plan	Modifying the project plan, conducting regular meetings and using efficient online communication tools like skype, slack etc.	Determining the efficiency of the plan by checking the project status using sprint burn down charts	High	Low
8	Risk of ignoring necessary requirements	Pre-planning requirements before starting the sprint	Adding the requirements in the next sprint.	High	Medium
9	The risk of a shortage of time (there may be the excess time required in case of lack of skilful developer or difficult tasks).	Allotting extra time for difficult tasks, cutting off the requirements	Frequently checking the sprint plan, burn down charts and get an overview of the remaining tasks, time.	Medium	Low

Table8: risks and mitigation strategies

QUALITY PLAN

Assuring quality is the most important factor to be considered in software projects. Better quality increases the benefits of the product. The entire project team is responsible for ensuring quality in the project. Agile views quality as fitness for use rather than conformance to requirements. Functionality and efficiency are the main characteristics relevant to online shopping system. Each

of the characteristics has sub-characteristics like security, suitability for functionality and time behavior for efficiency.

Quality Goals:

- ✓ Security- There should be secured access to authorised users.
- ✓ Suitability- The webpage should be user-friendly, easy to access, should have a simple user interface.
- ✓ Time behavior- Considering the response time, the coding complexity should be reduced such that page response increases.

Agile Quality Assurance- Steps

1. Evaluate the software implementation, for each user story we state acceptance criteria. This would eventually help the team to avoid conflicts or misinterpretation of requirements and thereby developing the product as desired.
2. Effective team co-ordination: There should be effective team co-ordination among the team members which ensures better work results. This can be attained by daily meetings which reduces misinterpretation of terms and ideas. Better work results ensure a better quality of the product.
3. Pair programming: Pair programming is done where two developers code together, in a steady development flow, avoiding bugs. It helps in identifying any deviations in the product development which ensures better quality.
4. Testing: At the end of each sprint, automated testing is planned using the testing tool selenium to perform the user acceptance testing which helps in validating if the system is in accordance with the customer's requirements. Testing helps in quality control
5. Experiences gained: The experiences gained from each sprint help to perform better in the next sprints which ensure better quality.
6. Risk control: In every daily scrum meeting specific time is allotted for risk control, in which new risks are identified and current risks are monitored and mitigated. This risk control also ensures better quality.