

APPLIED PROJECT MANAGEMENT(PA2515)

Team 24

Individual Report

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Question 1 - Project Development Methodology

1.1 Methodology used by team :

Development methodology is one of the key aspects of the software projects and selection is based on the type of project and team. In first group meeting after SWOT analysis the team has chosen SCRUM an agile development methodology to implement the project.

Explanation to choose this methodology:

- **Simple:** Agile methodology is easy to understand and implement as it provides a cost effective way for achieving scope of project by close interaction with customer fulfilling their needs and expectations even though team itself is the customer.
- **Team size** Scrum is convenient to develop a project in small teams. Our team with six members is quite small to adapt and use scrum efficiently.
- **Project Size:** Scrum has proven as one of the best methodology for small and medium scale projects. Since the project is small it is applicable here.
- **Time constraint:** The project has strict deadlines with short duration of six weeks where we organised two sprints. Scrum suits well for developing short term projects.
- **Customer satisfaction :** Scrum focus on customer satisfaction by frequent and close collaboration between customer and developers. As our project is an Online shopping system where the requirements are inconsistent (changes as per customer) and the application should be updated frequently for the user satisfaction. Scrum is very appropriate for this project.

1.2. Adaptations or customizations made by the team :

“Adaptations arise as the stakeholders and scrum core team learn through transparency and inspection and to make improvements in the work they are doing.”

Scrum meetings :

- **Explanation:** We re-organised our daily scrum meetings to 2-3 scrum meetings per week by taking individuals opinions in doodle to make decisions about meeting time and duration.
- **Justification :** We did this because we don't have time to attend daily scrum meetings as other course schedules are running parallel with respect to this project. So every team member doesn't have time to attend daily scrum meetings.
- **Reflection:** This adaptation does not affect our team. In order to get feedback from scrum master we documented our daily work by individual reports of team members specifying task on what they are working, its description and time spent on it. Even though daily scrum meetings not taken place, the project progress, dealing with risks, and their prioritization are done in sprint retrospective meetings.

Trello:

- **Explanation:** We used online tool “Trello” rather than physical whiteboard to list the tasks to do, doing and done during the sprints that represented the scrum board.
- **Justification:** We used this because we don't have our own room to represent scrum board and list out the tasks. I mentioned early we don't have daily scrum meetings to track progress of the project and to get feedback from team members if they are facing any problems to their allocated work.
- **Reflection:** In the beginning, we had some problem in using because it didn't feel natural but later we learnt to use trello effectively for project progress. As trello helped us to assign our team members individual tasks and reminder to deadline and schedule by sending notification

to individuals in tracking progress of team. This adoption enhanced the team progress even without daily scrum meetings and scrum board. So, this adoption was successful. Comments are made in cards to discuss the problems faced by team members.

1.3. Strengths of the methodology used:

- **Continuous testing:** As soon as the features are completed, testing takes place ensuring quick finding of defects. Cost overruns occur if defects are fixed later in the real time working environment that customer won't pay for extra effort spent in removing defects. So, this methodology helped to test the completed features and saved time to fix defects earlier rather than spending time to fix defects.
- **Short iterations and frequent delivery:** Scrum focus on sprints which are 2-4 weeks long. Such short sprints highly cost effective and as soon as the modules are developed, they are delivered to the customer opening more lines for communication to make any necessary required changes, thus it's a great advantage to have some working software that's boosted our team energy to work more efficiently.
- **Open communication:** Scrum provides a frequent communication with customer and developers mainly by using face to face interactions like daily meetings and scrum meetings. This way efficient communication exist and customer satisfaction is achieved. As communication plays a vital role in developing a project.
- **Progress tracking:** The sprint burndown charts helped to measure the individual performance and monitor the deviations that occurred in project. Scrum meetings gave the feedback from the scrum master about works to be done and suggesting necessary mitigation strategies for deviations for the project to be on schedule.

1.4. Weaknesses of the methodology used :

- **Lack of accurate documentation:** we learned that in agile scrum development it's better to have minimal documentation rather than no documentation. For example the developer who developed the component previously feels guilty when it takes a lot of time to understand the code logic that had been written long time ago which leads to lowering the motivation. As a result team agreed to include minimal documentation and minimal code comments to avoid this types of issues in future.
- **Not architecture based and unstructured process of working :** Traditional methods like waterfall follow the cyclic or stages for development of project but in scrum it's an iterative process that don't have a proper architecture for example when a new requirements are requested by user the we have to take an immediate meeting and add them which sometimes not possible when working in complex distributed co-allocated teams.
- **No activity for building conceptual model of the project:** I don't mean even for a small project development need a conceptual model but for medium and large scale projects i think there is need of conceptual model that gives a clear idea to what extent we have gone in development but in scrum there is no activities is seen to build a conceptual model of project that don't require much effort and time.
- **Unsuitability for large scale projects:** Many researches claim that scrum does not work effectively for large scale projects based on the factors like project size, complexity, need for speed and customer readiness. For example team commitment and effective communication are important aspects in scrum that are hard to achieve for large scale projects.

Question 2 - Monitoring and Control

2.1. The processes, methods and tools our team used to track progress:

- **Burn down charts:** we used burndown charts to track different mechanisms by graphical representation of work that left in the sprints. It also helped us to depict the work progress, to monitor and to predict the completion of tasks over consensus estimates of project plan.
- **Trello:** we used trello an online tool as scrum board to list what to do, on going and done tasks that organise our project into cards that consists lists of tasks. We used cards to assign each team member's tasks, to schedule a deadline and reminder to track individual progress and comments are given by team members if they face any problem for allocated tasks.
- **Scrum meetings:** In this meetings we used to get feedback from the scrum master of individual progress and asking the team members for sharing the ideas to improve the project progress to achieve quality in the final product.
- **Status meeting and status reports:** These status meetings helped to get valuable feedback from examiner to make any changes that required in project implementation. Examiner also analysed the individual contribution to the team work. In status reports we intimated the completed tasks and tasks to be done in future sprints. Thus analysis of overall project is done.
- **Individual work reports:** As I forementioned we don't have daily scrum meetings. So, we created individual work reports and uploaded in google drive that's lists individual tasks, description of tasks and hours spent on it daily that are viewed by scrum master for individual progress. Consensus effort estimation is done by team members using planning poker.

2.2 The extent that our team's deviate from actual project plans :

- **Deviation-1(ID1):** We as a team did consensus estimate by planning poker for sprint 1 as 220 hours in that 199 hours for individual work and other 21 hours for scrum meetings, status meetings and status report documentation but we could not complete some of features in sprint -1 .we did 83 % of work in comparison to completed work., So, we deviated 17% from actual project work.
- **Deviation-2(ID2):** In the sprint -2 due to lag in the sprint -1 we added more working hours to complete the project in time the total consensus estimate hours are 220 and 30 hours for the scrum meetings, status meetings, status reports and presentation documentation. However we don't have much deviation for the planned consensus estimates.

We calculated the deviations by using burndown charts graphs and planning poker to the assumed work to be done and actual work done.

Total estimated efforts and deviation.

ID.No	User stories	Total sprints	Consensus estimate for individual work	Consensus estimate for scrum meetings, status meetings and status reports.	Total hours for sprints	Deviation %
ID1	F01 to F09	Sprints-1	199	21	220	17%
ID2	F10 to F18	Sprint-2	220	30	250	11%

2.3 The reasons for these deviations :

ID1: a) Minor deviations: Examiner asked to revise the project plan and resubmission .so.we have to spend around 5 hours to do required changes in project plan.and resubmission.

b) In accurate effort estimation:As I mentioned earlier we estimated 220 hours for sprint-1 but we couldn't complete some features like login page and register page because it took more hours for training workshops to get knowledge for individuals who were weak in some developing skills.

ID2: a)Addition of features:Examiner asked to add more features to the product as he felt that the present features does not meet the effort of team in the first status meeting.so, we added more features then we got 3 features for each team member.

b)Others course schedules and examinations :Due to others courses running parallely we lagged behind the estimated progress for the first 3 days of week 7.some of team members have to attend others courses lectures and examnations.so we did not conduct scrum meetings during examinations for other team members.

2.4 The actions our team took as a result of these deviations:

ID1: a)Extra scrum meeting:We called for an immediate extra scrum meeting to revise the project plan and made necessary changes as per the assessment given by examiner and took feedback from team members once again and resubmitted on the same day.We motivated our team to work extra three hours for the project plan resubmission that's not included in effort estimation.

b)Extra effort to reach deadlines:To ensure the project in line we worked extra during the weekend to complete the planned tasks and we motivated all the team members to participate in brainstorming sessions to to reduce the effort on individual works and we shared the work and completed the login page and register page by team.

ID2: a)Pair programming :Even though pair programming is a part of scrum we worked in pairs to share knowledge and work , as we lagged in sprint-1 for conducting more training sessions .So, pair programing helped to increase the skills and abilities of programming languages of inexperienced from expertised team members and this minimised the individual stress of team.we motivated team to cope with each other and to complete the assigned tasks to reach project deadline.

b)Rescheduled scrum meetings:When some of team members had to take active part in other courses and examinations.we decide to reschedule the scrum meetings during weekends to get feedback from the scrum master and to track individual progress and came to assessment whether our team is on on schedule track.We already knew that we are lagged in sprint -1. So, every team member aimed in complete the project in time so we motivated ourselves to participate in scrum meetings even during weekends,

2.5 As a result of your experience on this project, what would you do in future projects

A)I will request the team members to give the fair report on their skills and abilities in developing project because lack of skills and abilities had made previously to work more on training sessions this is the primary reason for slow execution of project in sprint-1.**B)**Care should be taken to complete training secessions before commencement of development process,if this is done we have more time for productive work.**C)**A clear idea should be presented in proper utilization of progress tracking tools like burn down charts ,scrum boards,github and google drive because this helps to identify the deviations in the project.I suggest to use this tools for future projects to monitor and control purpose.**D)**I would suggest team members to develop a risk management plan by anticipating risks and how the mitigation strategy to be developed.**E)**For effort estimation ,expert judgment on estimation has to be considered when teams lacks in working together .

Question 3 - Risk Management and Quality Management

3.1 What processes, methods, and tools did your team use to identify the risks to the project and monitor risks during your project?

- **During brainstorming sessions:** Team members gave their opinions on the possible risks that occurs. Every team member discussed with other by sharing their ideas, based on team members ideas we created a risk management plan and documented the possible risks and prioritized them based on the impact they will create to project deviation,
- **Based on previous experience :** Team members made assumptions by the previous experience they got from working in similar kind of projects later whole team examined the assumptions and came to an collective agreement how to create and implement risk management plan.
- **Swot analysis :** The abilities and inabilities of team members were identified after SWOT analysis this gave a clear picture on individual abilities to develop risk mitigation strategies. .

By utilizing the above aspects risks are identified with their likeness to occur and risk impact also estimated.

3.2 Did any of the risks anticipated in your project plan actually occur during the project?

We created the risk management plan earlier in the project plan by following criterias like risks, mitigation strategy, monitoring strategy, its impact and probability to occur and we followed the same ideas how we planned in project management plan.

Risk id	Risk	Mitigation strategy	Impact
1	Scope of the project is high	Team members reduced the scope by prioritising the user stories .All changes made are informed to the product owner for his approval.	Medium
2	Lack of development experience	Allocated more training workshops which improved the individual abilities developing skills and to complete project in time .	High
3	Absence on team member on scrum meetings	We mitigated this risk by rescheduling meetings and if that's not possible then we conducted video conferences by online tools like skype . for the unavailable team members ,	Low
4	Delays in delivering tasks at the end of sprint.	We prioritised the the requirements in the product backlog list and we works more hours to do incompleted tasks..By keeping track of the burn down charts it gave a clear idea on sprint progress.	High

3.3 Did any risks or challenges occur that were not anticipated in the project plan?

Yes, We anticipated an extra risk that we didn't mention in project management plan.

Risk:

- **Under estimation of effort :**The effort estimated in the beginning of project not reflected to the actual effort during project execution.
- **Reason for being not anticipating this risk in project plan.**Based on the SWOT analysis done at first group meeting of the team members we assumed that every team member is familiar with developing programming languages.So,consensus effort estimation for features are done but in the middle of sprint one we realized that we lagged behind the schedule by tracking burndown charts.
- **Mitigation strategy:** This risk is mitigated by re-estimating the effort points by confirmation from individuals and feedback given by examiner.

3.4 What processes, methods, and tools did your team use both to ensure and to assess the quality of the software?

- **Effective team coordination:**Team coordination among team members ensured to work for more better results that we obtained by scrum meetings which reduced the misinterpretation of terms and ideas for better results to improve and assure quality.
- **Pair Programming:**When we developed the code as pairs in steady development flow .We avoided the bugs by reviewing one code with another who has some more experienced skills to develop the code. It ensured in early detection of defects that'll in turn ensures to maintain quality in the final product.
- **Testing:** At the end of each sprint we planned and performed automated testing by Selenium tool to validate whether we meet the customer requirements or not.So, testing helped in quality control.after the completion of website.We did performance testing to the reaction time of the website using GT metrix.Usability testing is performed by the team where we got feedback of our product after they used it.
- **Experienced gained:** The work experience gained in each sprint helped to perform better in the next sprints..After each feature is completed we had meeting with product owner to get feedback for making any changes required to improve quality of product.
- **Risks control:**In every scrum meeting, we allocated specific time for the risk control in which we identified the current risks and also monitored and mitigated this risks control to ensure better quality in the product.

3.5 Reflections on how effective the processes/methods/tools were in practice:

- The defects that made unexpected behaviour of the features during automating testing by selenium tool are rectified later by making necessary changes to code by intimating to developers.
- The code changes are based on the individual feedback got during usability testing.This ensured to improve quality of the product.
- The feedback given by the scrum master helped us to make the required changes to the product to improve the quality for further processes and to ensure quality in final product.
- We reduced the page response time by code optimization and by reduction in image size. As a result we achieved 8 sec as response time which was initially 11 sec.

Question 4 - Project Team

4.1 Aspects in which the team managed well in the project:

- **Risk identification and mitigation:** Risks that occur during project implementation are to be recognised at earlier stages of project. Even we noted down the risks that were previously mentioned in the project plan during the course. As we already have risk mitigation plan that reprioritized the risk and their impact and team member had already suggested that mitigation strategies. This helped to mitigate the risks easily.
- **Adherence towards the execution of project plan:** Every team members showed their dedication in successful completion of project till the end without any unwillingness. **Example.** When we lagged behind the schedule every one worked extra hours to complete the required features of sprint -1 during weekends with any objections. so in my view we had a good effort team.
- **Team management :1)** When we divide the roles and responsibilities of team members at first sprint meeting every individual carried their work in accordance with allocated feature to be developed. Even we helped each other when we have low developing skills and worked in pairs to minimise individual work effort. Sometimes if some of team members faced any problem in doing his allocated work we shared the work and helped them. **2)** Our scrum master Thejendra was not available during sprint -1 for first 3 days in the week 8. In order to work efficiently we conducted group meetings to discuss the progress and we together contributed to complete the product backlog in the week 8. So we managed team well if someone worked remotely. **3)** Every team members actively participated in the scrum meetings and brainstorming sessions and shared the ideas how to improve the development process and helped to mitigate the risks that occur in project. Even when scrum master called for extra meetings and extra effort everyone worked hard to their maximum efforts without any hesitation for successful completion of project.
- **Utilizing of training secessions:** Few team members lacked the knowledge in the tools and technologies that used for the scrum development. So we utilized the training session effectively and later we worked in pairs to share skills of expertise team members to the members who lacked knowledge in developing skills. Thus we helped each other and contributed to meet project goals.
- **Testing process:** we planned and managed the testing process As soon as the features are completed we documented test cases and automation testing is achieved by selenium tool and using Gmetrix tool we did performance testing for quality assurance.

4.2 Aspects for improving the project management:

- As i mentioned earlier due to lack of experience skills and abilities to develop a project our development time has taken more for the trainings secession which results in low productivity for sprint -1. If our team had experienced skills then we would have achieved more productivity and ensured more quality as we would find more time for testing due to this we lagged in first sprint and made extra effort for sprint 02.
- Some of the team members don't have practical knowledge to work on scrum. So when we done effort estimation using planning poker we thought that this effort estimation is much that the project to be developed and later we realise that we lagged in the schedule. Later we learnt how to estimate the effort for individual features depending on the complexity of the features. If all of our team members had practical knowledge in scrum development this problems

would not arise and this affected our productivity and increased individual stress to put more effort. Better productivity is achieved when team members don't have stress as motivation can be done easily to reach goal and even they feel free to cope with the working environment.

Shortcomings of working environment

- Even though implementation by scrum methodology we got delayed to reach the sprint deadlines
- No practical knowledge on scrum methodology implementation for some team members.
- Delays in sprints due to uncertainties caused by team members such as lack of knowledge and in accurate effort estimation.

Need improvements:

- "Sprints should be planned carefully to minimise the delays
- If time constraint is not a factor then increase the sprints length to avoid delays.
- Iterative planning is done based on the previous results.
- Weakness and strengths that need to be improved in order to improve the process are to be defined.
- A mini assessment has to be done to track initial and final progress..
- By considering the previous experience strengths and weakness are discussed.
- Prioritization of issues had to be made in the scrum meetings.

Question 5 - Your Role

5.1 Contribution to the success of the team:

- Roles were divided and distributed based on the skills that each team member got assessed at the kick off meeting.
- I have taken the following different roles in project development. My roles were Developer, Product owner, Tester and Trainer.

Developer :

- As a developer am responsible to develop the front end for some features of our application. I developed the code for the cart page and product page. In the cart page the user can view and add the products which he wants to place the order. Even he can edit the products if he changes his mind and if he is satisfied after selecting a product then cart page should proceed to place an order. The cart page should also have the details of the products selected by user and number of items and price to pay
- In the view product page the user can have access to see the product details he selected which shows images, price and size of items.
- Cart page was developed alone by me and for view product page I worked as pair to share my knowledge with my team members who have less developed skills in front end development.

Product owner :

- As a role of product owner I have the responsibility in understanding the user requirements and prioritise the requirements in the product backlog. So my overall responsibility is building and managing the product backlog and convey my vision to the team. Even am responsible for presenting solutions to problems that occurred during project development. Even though am not the project manager am responsible to motivate the team with a goal and vision.

Tester:

- As a role of tester I worked in pair with the other team member thejendra who is our scrum master where we initially wrote the test cases for each page together and later we divided

half work to each other where my responsibility is to perform testing for login page ,product page and payment page using selenium tool,then I documented the status of the test whether pass or fail and listed any defects occurred during testing.Out of 21 tests allocated me to test .2 got initially failed and later i reported the concerned developer to rectify the defects that occurred during testing.Later we did user acceptance testing from known users and documented the results but we didn't face any major issues in user acceptance testing .

Trainer :

- As i have skills and abilities in developing and testing environments of projects, the team assigned me as developer and tester in kick off meeting i came to know few members of team lacks knowledge in developing team and even some don't have knowledge how to utilise the trello and update the burndown charts ,So i have trained them to cope up with the team members.Some private training session are conducted to the individual team members to provide knowledge in programming languages like html,css and java .

Contribution on project plan:

- I myself contributed to the idea creation and documentation of non functional requirements and monitoring and control plan for the project plan.Thus helped in the project plan.

5.2 Do you think the roles you had during the project were the most effective use of your skills and knowledge? Justify your answer.

I would say YES

JUSTIFICATION :

- I would say that the roles accomplished during project corresponds to my abilities.
- In the beginning my roles were assigned as tester and product owner but later when the team faced problems and lagged in developing the product .they asked me to help in developing so as a developer i helped the team and coordinated with other team members to to develop some features and shared my programming developing skills.
- As a tester i accomplished my assigned work successfully with my previous experience in testing where we worked in pairs and i shared my knowledge and skills to other tester
- As a product owner with previous work experience in scrum environment i motivated my team with goal and vision and helped them in prioritising the product backlog .
- I shared my knowledge to my team mates in developing application and in managing the team to be on schedule.

From the above statements it's clearly indicates the effective use of knowledge and skills had taken place by my roles in the project.

5.3 If you were to perform the same roles on a similar project in the future, what would you do differently?

Developer:

- As a front end developer i would like to develop a code for the features by minimizing the work time and improving quality of the features .Code optimization is done to get reduce the response time.
- As our application is a web page i'll do code optimization to reduce the respond time .I think the effort spent by me in developing is less according to me .For effective team performance I actively take more part in the development of application.

- Even i would like to add quality attribute such as security to increase customer trust and to reach markets demands .

Tester:

- As a tester i will prioritize the test cases depending on the complexity in the present project we roughly divide the testing part. so i have to spend more time on complex parts so that it took me long time for testing
- .In the future projects i recommend the complex test cases are to be tested by working in pairs that helps the individual stress reduction on team members and to allocate less time for testing as we left with simple test case as they require low time and minimal effort for testing .for this project
- we did not perform the browser compatibility testing .I will recommend to do this for future projects to increase user satisfaction.

Apart from the above mentioned roles i would like to chose the scrum master as the main role to improve my practical knowledge in project management which further helps me to work in real time environment.

5.4 What are the most important aspects of software project management that you have learnt by participating in this project? Justify your answer using examples from your team's project.

- Even I have some working experience in developing projects .In this project i learnt how to work in pairs and minimise the individual stress and share knowledge and skills.
- The previous projects i developed were with same nationality team members but working in this project gave me experience of how to adopt the different working teams by eliminating cultures and language boundaries to work in future projects and gave me hope that i can cope up with globally distributed teams.
- For the previous working project we did not develop the risk management plan and mitigation strategies but now i got full knowledge how to develop a risk mitigation strategy and implementation of risk management plan by participating in this course..
- This project gave me a wide knowledge in different aspects of how to utilize the progress tracking tools,methods and to monitor the progress of team thats plays a crucial role in addressing the deviation of projects .so i gained knowledge on various tools and methods.
- The valuable suggestions and feedbacks given by examiner helped us how to manage a team and overcome the problems that we faced in the project implementation.

Conclusion:

- This project provided me the Overall practical knowledge on scrum implementations and how to manage a team and finally it gave a hope that i can work effectively in the future at companies .

References:

[1] Cohn, Mike. Succeeding with agile: software development using Scrum. Pearson Education, 2010.

