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**Acronym:Kach15**

**Team No:11**

**Individual Report**

**PA2515 Applied software Project Management.**

1. **Project Development Methodology** 
   1. Describe the project development methodology (also called a “lifecycle model”) your team used for the project.

Selecting suitable methodology is crucial for any project. We have selected Agile methodology. The development framework within agile chosen for our project is Scrum methodology using pair programming technique. In the initial phase of our project we discussed about our technical background and experience. Our team consists of 8 members and 2 of the are expertise in programming remaining others have hands on experience with the web development. As soon as we discussed our experiences we decided to work on the scrum methodology with pair programming technique. Our group has all the skilled team members so we had team autonomy. Usually the scrum consists scrum master, Product Owner and Scrum Team. In our Project both the scrum master and product owner also took the role as the developers. Scrum methodology also include product backlog; product backlog helps to add features of the project in the backlog. The scrum team as part of the project develop in sprints. At the end of every sprint user stories developed are verified. Our project includes an initial product release in sprint 2 and review the customer feedback (product owner) to know their review. The Selection of the feature from the product backlog select the feature based on complexity using their knowledge experience to prioritize them.

* 1. Why did your team choose this methodology?

The Motivation behind the scrum methodology selection is to the project is divided into sub tasks and implemented iteratively to review the development made at the end of each sprint before heading to new sprint [1]. The reason behind selection of agile methodology is our project is new, CMMI level1 and our requirements change, less time need for the document allocation and focus on software, cross functional teams. The pair Programming framework is used as it helps to share the knowledge with the partner and easy to learn from other. These we selected these three techniques to develop our project.

* 1. What role does the customer normally perform in your chosen development methodology?

The entire team were the customers the customer had the ability to asses the importance of the feature in our development we al the team members used the t shirt size method to prioritize the important and lesser important feature which are cross valid by the product owner who is the mediator between the customer and the investor so, any ups and downs he set us in the correct direction. The product owner plays a crucial role in our project as he helps by making sure right features out of large feature pool are put into the sprint backlog for right development, his role play is both effective for customer and the users. Thus he helps to set us in right direction.

* 1. Your customer for this particular project was not defined by me, so who did your team identify as a customer and how were they involved in your methodology?

Product owner is the customer in our chosen methodology to review the feedback and played role to reduce the bisas between the customer and investor. The entire team acted as customer and made the customer value to the feature selected. One of our team member had played the product owner role and our team used many websites as reference to develop new website and also have some knowledge about the features to be embedded in the website. Product owner help to insert and select right feature into and from product backlog. He is both product owner (customer) as well as developer.

* 1. What do ***you*** think are the strengths and weaknesses of the chosen methodology? Justify your answer using examples from your experience of participating in this project.

Strength: The strength of our project include scrum methodology firstly as it helps to change the requirements in the middle of development through scrum meetings. The scrum team can remove difficult features from the product backlog and add new features into it. Review meetings can be conducted for change in requirements and group voting together on the decision made (all are equally given importance). Our team included some less experienced developers so pair programming was helpful in balancing by having the driver and navigator concept it was easy to identify and rectify the defect codes. Even if one person wants to take a lave it doesn’t impact the entire development process which is also a strength to notice. One student experience include I was habituated with the procedures with scrum and pair programming now it helps to think every project in this dimensions it was fruitful. Weakness: The main drawback of this methodology is daily scrum meeting at a certain instance of time are very difficult. As the members in the team are involved in other three courses as well. Even though we tried to utilize maximum possible time by using the pair programming framework as well there were a little fluctuation in the daily scrum meetings.

* 1. Would ***you*** use the same development methodology for a similar software project in the future? If ***yes***: why is the methodology better than alternative methodologies that could be used? If ***no***: what methodology would you use instead, and why?

Yes, from my experience and the way our project is carried out this same development methodology would be apt to pic in the further similar projects. The main advantage here is we did face challenges smaller once but did not feel troubled with the methodology selected. The scrum Meeting were conducted in the initial phase very consistently and on daily basis. The scrum master in our project is generally nominated and given the priority to look into the task of organizing the scrum meeting. If I were given the opportunity to select the scrum master, I would select the scrum master based on the voting or some idea on project management issues. I also have to mention we didn’t face much problem with the existing methodology. But due to inefficiency in unsynchronized dates and different courses led to harder project management difficulties. If I were given the opportunity, I would as a team would decide and schedule our dates and availability as rapidly as we can to reduce the little gap we faced. The selected methodology is better than the other methodologies because We use the agile methodology which involves high level of design of the application before we even begin the process and define the design solution for the entire project could be possible in this case. Unlike the waterfall model where the product definition is stable and importantly it is applicable when there are ample resources and the requirements are fixed and clear. The incremental methodology is not selected because as our team in not highly experienced to put exact requirements at incremental level during the development that to requirements at right size with respect to time is highly complex in nature so we did not select them. This help to build the project step by step and solve the problems identified. Enables the team members and customers to understand their needs. We selected the iterative model as we have seen some advantages in it as this model we have defined major requirements but later the other requirements can evolve as project progress which is an advantage as our idea is start up and CMMI level 1 so requirements are not stable. The procedure in scrum is stable to design the product backlog then sprint backlog then the scrum meetings in which the sprint backlog tasks are expanded. Our project opted pair programming method instead of dividing the team into group of four and imbalance or unequal amount of experience level in each group in the middle of the development would impact person hours. Instead Pairing one experienced with one lesser experienced would save time and extra effort.

1. **Monitoring and Control**

2.1What processes, methods, and tools did your team use to measure and track progress during your project?

As part of initial stage of our project development we utilized the product backlog which is part of scrum methodology. All the features we thought as a team to develop are inserted in the product backlog. It is stored with all the team members using the google drive. Further from the product backlog some features are selected by the scrum team and are added into the sprint backlog this backlog changes for every sprint. We followed customer value criteria to select the sprint backlog. To select from product backlog and prioritize the list we followed T shirt size method that help to segregate the features based on the size, thus features are selected in the sprint backlog based on prioritization. Customer value criteria is selected as our idea is start up so each feature importance and value feedback can be known prior to development which is risk free. This help to track down the status of the project ant the remaining effort need to be put into. Log book is also used to track down how many persons’ hour’s effort is put into by individual in development. Based on the log book a burn down chart is also developed that helped to track down the project.

2.2 To what extent did your team’s actual progress on the project deviate from your team’s plans?

In the initial stage of the project we estimated the time and effort estimation for the project. We have used Visio tool. In the initial stage our team cohesiveness was high and during the later developing stage our cohesiveness decreased. But we had our sprint planning and feedback from the investor at the end of every review meeting gave the boost to strive for next stage development as our work progress is on a steady line. We were able to manage time consistently. Effort estimation first we used the COCOMO model to estimate the effort as our team composed of two expertized team members so, we thought their expertise will help us in development. But as the project development is in progress during our review meeting we came to figure out our decision of choosing on expertise advice is wrong and then all the team members came together to discuss on the effort estimation. Due to insertion of addition features like search the COCOMO model didn’t work so for sprint 3 as the sprint increased the complexity increased so, our initial effort estimation was wrong. Then in sprint 3 (we have total three sprints) we changed the entire effort estimation by assigning user defined points (1 user point=3 hours) of effort we came to this conclusion as a team and then the development is undergone. Also we had a deviation in search option efficiency decreased so we had to push over the previous estimation of the subscription and add the effort of subscription into the search option this is implemented when both the search and option button is developed up to 80 percent. So after this we are left with 19 hours of buffer which is in sufficient for subscription development which we calculated from the log book registration controlled by scrum master thus we had to skip subscription feature

2.3 What do ***you*** think were the reasons for these deviations? Justify your answer.

The initial effort estimation we thought expert advice within the team there are two team members so, they are apt for the effort estimation using COCOMO model. Later after the review meeting feedback we had to re plan due to inconsistency as our team consist of two expertise who are in different course so their scheduling with us enter remaining team members who are all from same course had slightly impact. But the main reason are courses and assignments. Due to long weekend and other courses even the planning as a team of 8 members for the effort need to be put into the search option in sprint 3 shown affect and the efficiency of the project decreased. So, to compensate that we add additional effort from the subscription feature and put into the search feature and didn’t develop the subscription option as we completely focused on the search feature but even then the efficiency of the search option is little decreased due to mainly complexity. We track down the replanting using planning poker and re effort estimation using the scrum master as basis in sprint 3. As our team had fluctuation in team cohesiveness we had a team back up in the final stages for additional effort.

2.4 What actions did your team take as a result of these deviations? Explain why these particular actions were taken.

Due to long hours’ weekend and other course assignments our team cohesiveness in developing search option declined to improve that we add additional effort (track using work breakdown structure) from the subscription feature and put into the search feature and didn’t develop the subscription option as we completely focused on the search feature but even then the efficiency of the search option is little decreased due tom mainly complexity. Another important action is to group together as a tem in effort estimation in sprint 3 as our project had some fluctuations and effort is re estimated and re planning is made using the planning poker. This helped us to some extent improve the search option efficiency and impact showed on complete skip of the subscription option.

2.5As a result of your experience on this project, what would ***you*** do in future projects to measure, control, and react to deviations between actual and planned progress? Explain your answer.

Firstly, based on the experience from the above project my first step for improvement start at the initial stage of development calculate the working hours’ team members courses and their busy hours are much more critically analyzed and are updated. Instead of putting a log book for only the effort team member put into the project I would like to create another log book temporarily that help to update the new status of the team member availability once in every two days other than most usual Saturday and Sunday and long weekend which are already considered new like the courses and classes personal works might get re schedule. This can help to certainly decrease the decrease in the team cohesiveness in the final stage. Secondly, instead of nominating the expertise for the entire effort estimation I would rather give the team entire opportunity to plan and estimate the effort in the initial stage of the development so, instead of using the COCMO model I would rather prefer the Planning poker model. In sprint 3 we would have re planned by giving the search option more priority and completely focus the effort on it instead of shifting first to subscription then due to lack of time again shift backward and focus completely on the search option.

**3. Risk Management and Quality Management**

3.1 How did your team identify the risks to the project?

From the beginning of the project every team member during the phases analysis, design, development, testing under each sprint we have the user stories the team member in every sprint took the role assigned and implemented the job. During the process execution sometimes team members face difficulties in the area of their work. The team members give the risk details they faced to the scrum master. The risk management plan is developed by the scrum master in our project and the major risk in our project are discussed within the team and are documented in the plan and can be updated by any team members. The risk management plan in our project comprise of both the identified risk and the mitigation strategy. During the development phase at the end of each sprint the risk is noted or updated alongside with the old risks. All the risks are tracked down and further the mitigation strategy can be used in further projects. Although our team didn’t correctly identify all the risks there are few others which we missed to report during our project plan.

3.2 Did any of the risks anticipated in your project plan actually occur during the project? If ***yes***: what were these risks, and what actions did the team take to reduce the impact of them once they had occurred? If ***no***: what actions did the team take to minimize the chance that the risks identified in the project would occur?

In my perspective with respect to project related risk management, I think some risks are identified and all the risks are materialized during the project development phase and are anticipated throughout the projects. The risk management plan in our project consist of 5 risks which we thought to be occurred in our project. The mitigation strategies that are proposed are implemented and for the first case Broad scope yes we found the topic selected broad scope soe we had to shift our features from the product backlog to the next sprint based on the effort we need to put into and then reduced the scope for each sprint. Secondly as we go on push the features one or two like search and donor n subscription our last sprint became huge. So, lesson learnt so we estimated an effort using the planning poker. The third case also we faced some difficulty in code understandability but later after scrum meeting and discussion we reduced the gap. first Unfortunately, only 4 risks are materialized. The materialized risks and their corresponding mitigation strategy are as follow:

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| --- | --- | --- |
| Risk ID | Risk | Mitigation Strategy. |
| Rid 1 | Broad Scope | We tried to reduce the total number of feature sin the current phase/sprint and shifted to next level finally in the last sprint due to insufficient person hours we rejected some features thus some how reduced the scope. |
| Rid 2 | Inaccurate time and effort estimation | Create log book temporarily to know status of the team member availability once in every two days other than most usual new like the courses and classes personal works might get reschedule. Instead of nominating the expertise for the entire effort estimation, give the team entire opportunity to plan and estimate the effort, instead of the COCMO rather prefer the Planning poker model. |
| Rid3 | Misunderstood domain specific terminology | Care to be taken during development to use user friendly functions. This help to review the code easily and the additional input to it for further development. Instead of using complex code and again explain it then start working on next step is time consuming. |
| Rid4 | Data loss | We tried to store our documentation and every piece of code shared within the Github and project management is done in taiga and design of interface is done using the Visio tool. |

3.3 Did any risks or challenges occur that were *not* anticipated in the project plan? If ***yes***: what were these risks, and why do *you* think they were not anticipated in the project plan? If ***no***: why do ***you*** think that your team encountered no unanticipated risks?

Yes, there are Some other risks which we did not anticipated and they are not written in our project management plan as well which shown impact on the entire project. Some of the risks we faced occurred in the sprint 3 which we were unable to write in our project plan. The following are the risk which are not anticipated. **Risk of Missing team members:** Some team members during the project development are unavailable which shown impact over the efficacy of some features within project. We followed mitigation strategy to assign the task to interested person or his pair programming partner. **Risk of delayed delivery:** Some features of the project are skipped due to time constraint and unavailable if the person working hours’ utmost each person is left with 2 to 2.5 hours. But the subscription effort is added to search option and complete focus is shifted to it which helped to reduce the risk of failure in delivery of product.

3.4 What criteria did your team specify for the quality of the software produced?

During our planning phase, we don’t have any experience to identify he usability of the product/website. We tired to specify the quality of the product based on few metrics selected that are used as baseline. Later stages at the end of each sprint we tried to generate test cases using the manual testing tools selenium to generate test cases and test the functionality of the website.

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

The process used in the project management to ensure quality are Pair programming techniques, quality control technique and quality standards. Pair programming: This help to reduce the defect and help to track the issues. It helps to give an input to the website and test the functionality. When there is no error then the website is of good quality. The navigator reviews the code parallel when the driver right the code this help to reduce time and space complexity and improve usability of the website. Final stage overall quality assurance is made by final test run. The test plans and the test cases are generated at the end of each sprint and these are manually tested. The website is deployed in the local host sever to test its functionality. Quality standard include meetings conducted between pair programmers and the the whole team together to discus functionality of website and the problem that are faced during the development and trying to reduce or plan to implement in different way. Quality control is done by reviewing (which is one method to test the quality, website) others work in the area suggestions to maintain good quality in the outcome of the product.

**4. Project Team**

4.1 In what ways do ***you*** think your team managed the project well? In your answer, provide specific examples, and explain why you think your team was good at these aspects.

Team managing project well: Firstly, I would appreciate my team in the initial stage the way we planned in initial stage. Everybody idea is given importance and the SWOT analysis is made to know the scope of the project which help us to unify in next phases. Our team is a cohesive team and willing to work. Everybody participated in the project there were no ups and downs with respect to work done. Our team conducted lot of meetings and lot of discussion help us to improve the websites. The aspects in which our team well performed are: There was always a unified decision, all the team members have contributed equally during the development even though we had some ups and downs we balanced them by discussion. The concept of pair programming helps to develop the product in a well planned way with discussion involving whether to put the feature or not code distribution. Transparency was maintained by every person. The plus point in our project is we planned to release the product in sprint 2 itself and then get the customer feedback based on which further improvisation and adding of features are made. Thus is a risky task but both the sprint 1 and sprint 2 are successfully implemented to 100 %. The decision making within the team was relatively very good and we all are open minded to discuss the problem if any task is at risk and eliminate it if necessary substantially. The problem we faced is we tired to measure the effort estimation using the COCOMO model using the two expertise available but in the sprint three when we faced problem and based on the review meeting feedback we tried to implement new model and which we managed to do as we were capable of taking unified decision to change the entire re effort estimation and specify the user defined points for the effort. Thus was one successful attempt which help us to increase the efficiency of the project from not developing the features both search option and subscription (It is comprised of several linking features with existing webpages developed) to developing an efficient search option. Even thought we were busy with the assignments I was involved in the development phase in sprint 2 during which I have to design the database and connect it with the front end interface. I faced problem in connecting to the server an d took this problem to the notice of the scrum master. The scrum master tried to resolve the situation by conducting a group meeting then we discussed the problem and resolved. This highly helped to solve the problem rather than wasting my person hours for misuse. Examples: There are several examples as addressed above our team was very cohesive in team transparency. Team very frequently had the scrum meetings. The scrum meetings generally addressed all the problems faced in the development of the project and the next step in development are discussed about the way they can be managed within time. Other examples include changing of entire effort where once again in the difficult situation all the team together came to work on complete re effort estimation in these both situations when there is no difficult level and when team faced trouble entire team came to discuss on the issue and they are resolved. Some other examples include the team also involved in pair programming when the team pair faced difficult problem then the code is discussed and the ambiguity is reduced. Convincing for team performance: The team performed well because in the initial stages the team worked and discussed clearly on how the project sprints are going to be developed. Clear requirements are deduced and the features are developed in parallel with customer value criteria that help to improve if any necessary and the testing at the end of every sprint to greater test case everything went as planned and if any problem is face alternative routes and solutions are discussed this helped to reduce the team uncertainty.

4.2 In what ways do ***you*** think your team could have managed the project better? In your answer, provide specific examples, explain what *you* think caused your team to perform less well on these aspects, and discuss what changes could have improved the team’s performance.

I think the following hindrances occurred during our project development. Why team performed badly: We faced mainly problem in the redeveloped phase specially in the sprint 3. I believe the main problem occurred when the code is not clearly explained when asked by the team member which is highly unlikely due to stress and which took me some extra hours to understand without any help in one case. Due to holidays and long weekend and exam and assignment our schedule was tight but we managed in an ineffective way as we had very les time to discuss unlike in sprint 1 and sprint 2 this could have been improvised if we Create a general log book temporarily to know status of the team member availability once in every two days other than most usual new like the courses and classes personal works might get reschedule. Team would have managed better: For the final feature that we added our duration for the sprint might have been increased as the complexity is high but at the same time external environment impact like final presentation of product if we had another 5 day say, each person effort 4 hours\*8 hours\*5\*hours=200 hours-19 buffer=181 hours) would help us to complete the final subscription feature as well. As we believed the face to face meeting are highly effective but in unlikely situations we could use the skype call or google hangouts which is not or never implemented through out the project. If we did so for we would have at least developed some part of the subscription feature an increase the sprint 3 completion from 83% to 92%. Specific examples: For example: when we tried to develop a code during our development phase sometime we can’t get access to the time availability of the partner to work with me. Then the lesser experienced team members cannot implement the code the effort gets wasted. So, appropriate time frames are to be selected so that both can work and discuss together sometimes the pair programming cannot be worked when the task complexity increases this is analyzed from the project. The other other cases can be during the initial phase we would have selected appropriate method for effort estimation awe only dependent on the expertize advice their advice would have been cross validated with the existing literature to look into similarities for further implementation.

**5. Your Role**

5.1 Describe the roles that ***you*** performed in the project team.

 Every member of our team are assigned with roles to complete the task within the time. My role in the project include in all the three sprints that we thought to develop during the project I was the main designer with my pair partner Harini we both are the designers in the project. Harini designed the interfaces and the blueprints for the website. I was involved in finding the class and attribute relations and designing the UML diagrams for the database management system. During the initial Phase my work and Akshay (expertise advice) and Shiva (product owner) roles in deducing the final idea out of idea pool we three played an important role. During the development phase I was involved in the backend database connectivity. In sprint two I war one out of 4 developers worked on the project. Mainly in sprint 1 and sprint 2 I was involved in backend database connectivity using the scripting language php. During sprint 3 I was involved in backend connectivity programming for search option. The above mentioned roles are my main roles in the project. Others include I involved in a bit discussion for better presentation preparation along with Product owner which was helpful for the team to perform better.

5.2 Do ***you*** think these roles were the most effective use of your skills and knowledge? Justify your answer.

I had about 3 years of programming experience in te academics during bachelors in developing programming. I was involved in the backend development and connectivity for the website. This role play is efficient for me as I am not so expertized in front end so I have to be dependent on other which makes me weaker if I am in the front end development field. I was the driver in the development phase and my pair id was the navigator to identify the mistakes. Some cases we interchanged the role. I have gained some experience in front end development through this project and I had some previous experience in back end connectivity in the academics which helped me. In the development project I used some of my knowledge with respect to programming languages PHP, My sql and Visio tool for database connective hosting a server and connecting to the local host are the activities that I preformed in the project. The pair programming framework is very apt if one of the programmer is not so experienced I can type the code but it can be reviewed by an experienced person. This helped me to gain and recall my work in the past with front end development which is very useful. From our recent study about the scrum methodology and live implementation and hands on experience of it gave me an idea about how the method work during the development phase with the team members. I gained different experiences during the different phases of development at different situations during all the three sprints. We changed our role play and in my team two people were good in programming their help was very efficient when ever needed to develop the website so, their advice was taken as well during the development and they tried to convenience in an understandable way which was overall highly helpful. Hence the role I played in development of this project were the most effective use of my skills and knowledge.

5.3 How did ***you*** contribute to the success of your team in terms of (a) managing the project; and, (b) building the software product?

(a) In terms of managing the project I participated in the discussions for how to present the product (trial version) on the way to put forth the product during investor. During the final presentation I was involved in keen role for discussion about our project planning. I tried to attend all the meetings and participated in all the meetings. When I faced difficulty in attending the meeting I personally informed the scrum master. I als involved in the extra effort whn my pair partner aked for any work on simple issues thus me and my pair partner tired to finish the task within the persons hours. I personally encouraged al of them are given opportunity to speak during the meeting and discussed the scenarios which the individual developed during their work in the project this helped to build the confidence as they know what they have contributed to the project. I role during the design phase I managed to design the project using the visio tool. During the development phase I tried to connect to the Xampp server using the MySQL.

(b)As I have the previous experience in programming language me and my pair partner took the interface design and the database connectivity during design and development phase ie., backend database connectivity of the website with the frontend so we tried to make the website more dynamic rather than static. I could complete the task of connectivity within the time for both the sprint 1 and sprint 2 the efficiency of developed website was 100%. Unlikely due to in efficient time management and other issues I along with the development team were unable to properly connect the subscription option and it is more static by the end of the project, but I was involved in database connectivity for search option as well as it was complex task other developers also gave me opportunity to develop and I tried to utilize maximum effort to finish the search option which I did successfully.

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

The main experience I gained was how the scrum methodology is implemented and how to schedule myself for daily scrum meeting and pair programming how does it work in the development phase was highly informative which gave us the total picture of how team should work during the development phase of the project. In this project I gained experience on how the scrum master should function. I failed to perform well during sprint 3 and unable to connect the front end with database in some features like search option and donors. If for example I was the scrum master, I would initially create a temporary log backlog which help to update and edit the hours during which the team members are available to work together unlike during some time in the day it could be planned in an effective manner if there are discussions among the group. Another example could be if I was in the product Owner role would rather reduce the scope shifting to next sprint and rather more concentration on the current sprint feature selection and thus don’t bring up all the complex task at the end of the sprint which would make the project harder to finish in time so, would reduce the complete effort estimation at the beginning of the sprint itself.