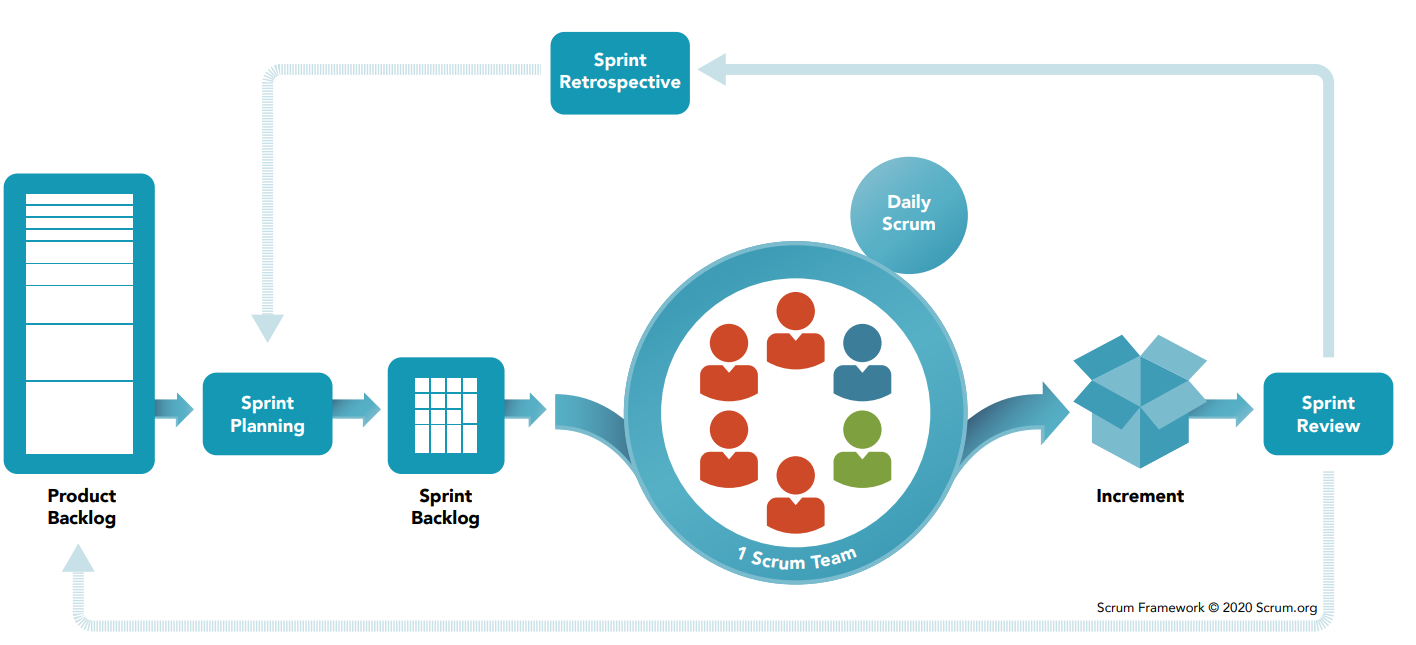
1. **ESSAY (40 points)**
2. **(LO 1, 10 points)** Explain in your own words the 5 differences between SCRUM and plan driven development!.

**Answer:**

|  |  |  |
| --- | --- | --- |
| **No.** | **Scrum Development** | **Plan Driven Development** |
| 1. | **The testing process** is completely **based on the incremental progress**. Therefore, the client and team **know exactly what is complete and what is not**. This reduces risk in the development process. | **The testing process** **starts once development is over**. Therefore, the client and team **have high chances of bugs to be found** later in development where they are expensive to fix. |
| 2. | Cross functional team with knowledge of the product **invested in the whole team through shared experiences**. | Cross functional team with knowledge of the product **handovers between analyze design build test** phases **with knowledge stored in documents**. |
| 3. | **Saves time and money**. If found inappropriate then by **just reviewing regular sprints in the development process**. | It may **take extra time as reviewing is done at the result only**, if found inappropriate then **the process is back to level 1**. |
| 4. | **The development process** is **divided among the team as an individual**, it **does not wait for the previous stage to get completed**. | **The development process** is **completed one at a time**. it does **wait for the previous stage to get completed**. |
| 5. | **Not bound by a tight deadline**. **customer also not rushing for the software** because aware of every movement or development taking place for his product. | **Bound by a tight deadline**. **customer can be rushing for the software** because didn’t know detail development taking place for his product. |

1. **(LO 1, LO 2, 10 points)** Explain in your own words about SCRUM framework, support your answer with picture!.

**Answer:**



**Picture Reference :** <https://www.scrum.org/resources/scrum-framework-poster>

1. **Product Backlog**

* Lists the features required as part of the final product and lists all features, functionality, requirements, enhancements, and fixes that are changes that will be made to the product in future releases.

1. **Sprint Planning**

* The Scrum Team jointly determines the goals (Sprint Goal) and what will be done in 1 sprint (Sprint Backlog) starts from the highest priority.

1. **Sprint Backlog**

* Collection of Product Backlog items selected for Sprint about what functionality will be available in the next update and the work required to deliver that functionality as future Product updates

1. **Sprint Review**

* Development Team will describe and demonstrate the results they have achieved during 1 sprint, Discuss about delay, causes of it, and solution in the future.

1. **Sprint Retrospective**

* Review of team performance and performance during one sprint such as what Done Well, what Went Wrong, and what would be improved.

1. **(LO 1, LO 2, 5 points)** What should be done at grooming stage! Who is(are) involved at this stage!

**Answer:**

* Grooming is the **first step that must be done before doing the sprint** stages in Scrum.
* **To choosing which priority stages** should be carried out during the sprint work.
* **Must be attended by the entire Scrum Team**, which includes the Product Owner, Scrum Master and Development Team.
* Grooming often **happens two to three days before the end of a sprint**.
* **Each Grooming has a maximum time limit of 30 minutes** to determine priority of the sprint.

1. **(LO 1, LO 3, 5 points)** Explain about velocity in SCRUM! What should be done if there is an abnormal termination!.

**Answer:**

* **Velocity is indication of the average amount of Product Backlog turned into an Increment** of product during a Sprint **tracked by the Development Team for use within the Scrum Team**.
* **Helps Product Owner to gauge how quickly a team may work through the backlog**, because the report tracks the forecast and completed work over several iterations.
* **Scrum Team can understand** their progress, their strengths and how they can improve Sprint over Sprint to become better.
* **Abnormal termination is when a Sprint is Cancelled by Product Owner** because New features request or request to fix bugs in delivered features.
* **The Scrum Master is needed to step in and remind management how Scrum is done** and **show them how ending a Sprint preserves the accuracy of team velocity metrics**.

1. **(LO 1, LO 3, 5 points)** Please explain why technical debt occur in SCRUM!.

**Answer:**

* **Technical debt occurs when software design and implementation decisions** **bump up against or straight-up collide with business goals and deadlines**.
* **Pressure on the project team because of the (unrealistic) deadlines. These attempts lead to sloppy work and more errors, which cause further delays**.
* **New functionalities continue to be conceived and requested as the project proceeds**.
* **Insufficiently qualified personnel** can cause project delays **as do knowledge and skills in working together** to fulfill the requirements of the project.
* **Customers do not react in a timely manner to areas in which they must be involved in the Sprint**, didn't know the detailed so the misunderstanding can be occurs, projects can come to a standstill.

1. **(LO 1, LO 2, 5 points)** Please mention and explain about roles in SCRUM, support your answer with the characteristic of each!

**Answer:**

1. **Product Owner**

* Responsible for defining the user stories and create a process as to how we will be developing the software/system.
* Create a Product Backlog, such as a list of business developments that will have an impact on the team work that will be done by the team.
* Convey every progress of the team's work to the client (user) of the product the team is working on / developing.

1. **Scrum Master**

* The Sprint creation process went smoothly.
* Remove barriers that have an impact on productivity.
* Organizing and facilitating meetings between the product owner and the development team.

1. **Scrum Team Members (Development Team)**

* Responsible for developing the core system with technical development and converts the user stories in the usable software.
* The ideal team size is 5-10 people per team, aimed at completing significant work in the Sprint.
* Consists of Back End Developer, Front End Developer, System Analyst, Software Tester, UI/UX Designer.

1. **CASE (60 points)**

Mrs. Alvina Aulia is the owner of Sekolah Tinggi Maju Mundur Cantik (STMMC) that focuses at information technology. STMMC does not have learning management system. So Mrs. Alvina asked you and your team to build this information system. The details of the application that is expected by Mrs. Alvina are as follows:

1. There are 3 groups of user, namely : Admin, Lecturer and Student. These group must login with email and password to access the application. Each of group have different menu privilege.
2. Admin can access and use all menus in the application.
3. Lecturers and students can view the schedule and access lecture material.
4. Admins manage point 3’s data.
5. Lecturers upload score of each student, for mid test, final test, quiz. The application calculates the score to generate grade.
6. Student can view the grade with its detail scores.
7. Communication between students and lecturers can be supported by the application. This feature is discussion forum, each post can be replied to by students and lecturers. Each post will be grouped into course, class, topic, and date.
8. Students and lecturers can view the exam schedule and location for each subject every semester. Lecturers can view and download students answer through the application.

Mrs. Alvina already learn about SCRUM, so she asked you and your team to use SCRUM to develop the application.

**Based on the case above, answer the following questions:**

1. **(LO 1, LO 2, 5 points)** **Create an organizational structure** (complete with names) to describe the parties involved along the sprint, **both internal and external!** Also **explain the duties and responsibilities of each**!

**Answer:**

**Organizational Structure (Internal STMMC):**

A picture containing timeline

Description automatically generated

1. **Principal**

* Ensure can post new announcement or any change in policy to the system.
* New announcement could be seen by all faculty member, lecturer, and student.
* Ensure can directly talk to any lecturer or student related to any school matter.
* Ensure can view the reports corresponding to each lecturer, class, and student.
* Can view report at three levels with certain performance metrics in report.

1. **Product Owner**

* Ensure Development team develop software based on Product Owner rules.
* Ensure Product Backlog is defined properly.
* Ensure every progress of the task going based to the user stories.

1. **IT Manager**

* Ensure that all the entities involved have the proper privileges and there should not be any information leakage due to inappropriate privileges.
* Ensure the network traffic on the system in manageable and system runs smooth with a good performance.
* Ensure the backup mechanism in case of database inconsistency or database failures can be done.

1. **Admin**

* Ensure can Login to the Application and Access the Application.
* Ensure Can used all menus in the Application.
* Ensure can manage point schedule and access lecture material data.

1. **Lecturer**

* Ensure can Login to the Application and Access the Application.
* Ensure can upload score of each student, for mid test, final test, quiz.
* Ensure can view the schedule and access lecture material.
* Ensure can communicate to students via Discussion Forum that each post will be grouped into course, class, topic, and date.
* Can view the exam schedule and location for each subject every semester.
* Ensure can view and download students answer through the application.

1. **Student**

* Ensure can Login to the Application and Access the Application.
* Ensure can view the grade with its detail scores.
* Ensure can view the schedule and access lecture material.
* Ensure can communicate to Lecturer via Discussion Forum.
* Can view the exam schedule and location for each subject every semester.
* Ensure can upload Mid Test or Final Test or Quiz answer through the application.

**Organizational Structure (External of Scrum Development of STMMC):**

A picture containing graphical user interface

Description automatically generated

1. **Scrum Master**

* Ensure Sprint Creation and Planning process went smoothly.
* Ensure remove barriers that have impact on productivity.
* Facilitate meetings between the product owner and the development team

1. **Chief Technology Officer (CTO)**

* Ensure technology resources satisfy the product short and long-term needs.
* Make decisions on behalf of the company’s technological requirements.
* Communicate tech-strategy to partners and investors.
* Supervise system infrastructure to ensure functionality and efficiency.

1. **Stakeholder**

* Involved in the project or have interests that affected by the project’s outcome.
* Ensure all strategic business objectives meet the expectation.
* Ensure Project Progress in the right direction.

1. **Chief Finance Officer (CFO)**

* Reviewing all formal finance and IT related procedures.
* Establishing and developing relations with senior management and external partners and stakeholders.
* Providing strategic recommendations to the CEO/president and members of the executive management team.
* Managing the processes for financial forecasting and budgets and overseeing the preparation of all financial reporting.

1. **IT General Manager**

* Ensure employees are motivated and productive.
* Design strategy and set goals for growth of the company.
* Evaluating performance and productivity.
* Generating reports and giving presentations.

1. **IT Manager**

* Monitor performance of information technology systems to determine cost and productivity levels, and to make recommendations for improving the IT infrastructure.
* Overseeing and determining timeframes for major IT projects including system updates, upgrades, migrations, and outages.
* Running regular checks on network and data security.
* Designing training programs and workshops for staff member.
* Running and sharing regular operation system reports with senior staff.

1. **Product Owner**

* Ensure Development team develop software based on Product Owner rules.
* Ensure Product Backlog is defined properly.
* Ensure every progress of the task going based to the user stories.

1. **UI & UX Manager**

* Ensure UI Designer worked based on the Sprint Planning and Product Backlog Grooming Priority.
* Ensure UX Designer worked in the right track based on Backlog Grooming Priority dan Sprint Planning.

1. **DevOps Manager**

* Evaluates technological choices (network/hardware related and technology/code related) by querying providers and providing evaluations of each solution include ROI evaluations in the present and future implications, limitations, and opportunities.
* Manages analysis and approval of new code through security and performance gates that will design and develop for feature-complete software. Be an advocate for security and performance standards in the organization.
* Manages operational aspect of production and development servers including developing, training in, and validating compliance with procedures and checklists related to disk space usage, monitoring solutions, deployment, conventions, access to the production and development sources, source control access and usage, performance monitoring, code modifications validation, scheduling, and more.

1. **Back End Developer**

* Developing ideas for new programs, products, or features by monitoring industry developments and trends.
* Compile and analyze data, processes, and codes to troubleshoot problems and identify areas for improvement.
* Collaborating with the front-end developers and other team members to establish objectives and design more functional, cohesive codes to enhance the user experience.

1. **Front End Developer**

* Determining the structure and design of web pages.
* Ensuring web design is optimized for smartphones.
* Building reusable code for future use.
* Optimizing web pages for maximum speed and scalability.
* Utilizing a variety of markup languages to write web pages.
* Maintaining brand consistency throughout the design.

1. **UI Designer**

* Develop standard UI components and style guides for company-wide use.
* Effectively communicate designs to developers and other key stakeholders.
* Address product, marketing, and business needs.
* Conduct industry research and stay up to date on best practices, competitor UI designs and emerging technologies.
* Provide support and internal training.
* Conduct, observe and analyses usability testing sessions.
* Develop consistent, intuitive architectures.

1. **UX Designer**

* Create prototypes and wireframes.
* Conduct usability testing.
* Create user stories, personas, and storyboards.
* Plan and conduct user research and competitor analysis.

1. **Software Tester**

* Interacting with clients to understand product requirements.
* Participating in design reviews and providing input on requirements, product design, and potential problems.
* Reviewing software requirements and preparing test scenarios.
* Executing tests on software usability.
* Analyzing test results on database impacts, errors or bugs, and usability.

1. **(LO 1, LO 2, 5 points)** **Generate minimum 3 user stories with complete ‘satisfaction condition’**!

**Answer:**

1. **Lecturer:**

* Story 1: As a lecturer I want to be able to input all assignments or projects into the system.

Story 2: As a Lecturer I want to be able to upload teaching material for the students.

* Story 3: As a Lecturer I want to be able to input students’ grades.
* Story 4: As a Lecturer I want to be able to print the report cards of each student.
* Story 5: As a Lecturer I need to be able to see my students per class.

1. **Students:**

* Story 1: As a student I want to be able upload my assignments.
* Story 2: As a student I want to be able to see my grades.
* Story 3: As a student I want to be able to download all materials given by the teacher.
* Story 4: As a student I want to be able to contact/chat with my teacher for consultation.

1. **Admin**

* As a admin I want to be able to add a new faculty member to the system and give him/her applicable privileges.
* As a admin I want to be able to assign the teacher to various classes and assign students of a class to a particular student.
* As a admin I want to be able to give the rights to teacher to upload the assignments.

1. **IT Manager**

* As a IT manager I want to be able to Ensure that all the entities involved have the proper privileges and there should not be any information leakage due to inappropriate privileges.
* As a IT manager I want to be able to Ensure the network traffic on the system in manageable and system runs smooth with a good performance.
* As a IT manager I want to be able to Develop a backup mechanism in case of database inconsistency or database failures.

1. **The Principal**

* As a principal I want to be able to post new announcement or any change in policy to the system.
* As a principal I want to be able can directly talk to any lecturer or student related to any school matter.
* As a principal I want to be able to view the reports corresponding to each lecturer, class, and student. At all three levels, there should be report with certain performance metrics in report.

1. **(LO 1, LO 3, 10 points)** **Do the PBI definition and of course conduct the first grooming**!

**Answer:**

1. **First Priority**

* Report generation at lecturer, class and student level which includes such as grades, mid test score, final test score , quiz score, report score, and personal data.
* Get the report of all activities that happen in the school such as graduation day, school festival and so on.
* Creating a backup Database for the purpose of 100% availability of the system.

1. **Second Priority**

* Announcement to student or lecturer or both for the important message needed such as an accident in the school.
* See the report of all students for certain semester.
* See overall grade from the start of the year until end of the year.

1. **Third Priority**

* Add a new faculty member to the system and give him/her applicable privileges.
* Able to assign the lecturer to various classes and assign students of a class to a particular student.
* Able to give the rights to lecturer to upload the assignments and discuss in the Forum. Each post can be replied to by students and lecturers. Each post will be grouped into course, class, topic, and date..
* Students and lecturers can view the exam schedule and location for each subject every semester. Lecturers can view and download students answer through the application.

1. **(LO 1, LO 2, 10 points)** **Choose 3 product backlogs, conduct sprint planning for the three product backlogs**!

**Answer:**

* There will be 6 sprints for the backlog items.
* Each sprint will be 3 weeks long (120 hours) 🡪 15 days.

1. **First Priority Sprint Planning**

**First Sprint**

* Proof of Concept (Feasibility Check) will be done for both the outstanding items.
* Any impediment or blockers will be resolved to start the actual development.

**Second Sprint**

* 3 days 🡪 Making of faculty level reports.
* 3 days 🡪 Making of class level reports.
* 3 days 🡪 Making of student level reports.
* 2 day 🡪 Doing an integration testing for all those reports.

1. **Second Priority Sprint Planning**

**Third Sprint**

* 3 Days 🡪 Creation of new database as a backup of existing.
* 4 Days 🡪 Establishing the connection between primary and backup database.
* 5 Days 🡪 Testing the backup database by manually failing the primary one.

**Fourth Sprint**

* 3 Days 🡪 System to be able print all student in a class report card for lecturer.
* 2 Days 🡪 Report all student for certain semester for lecturer.
* 2 Days 🡪 Download one file given by the lecturer.
* 3 Days 🡪 Able to see overall grades from the very first semester.
* 4 Days 🡪 Testing all development.

1. **Third Priority Sprint Planning**

**Fifth Sprint**

* 4 Days 🡪 Making an announcement for the resident of school.
* 3 Days 🡪 report of all the student and lecturer data.
* 2 Days 🡪 Report all activities in school.
* 5 Days 🡪 Testing all development.

**Six Sprint**

* 5 Days 🡪 Report of all activities that happen in the school such as graduation day, school festival and so on.
* 1 Days 🡪 Administrator can add a new faculty member to the system and give him/her applicable privileges.
* 3 Days 🡪 Administrator able to assign the lecturer to various classes and assign students of a class to a particular student.
* 1 Days 🡪 Lecturer able to give the rights to teacher to upload the assignments.
* 5 Days 🡪 Testing all development.

1. **(LO 1, LO 2, 10 points)** According to point 3, **describe what was done in the sprint execution stage for the three product backlogs**!

**Answer:**

1. **First Priority Sprint Planning**

**First Sprint**

* Proof of Concept (Feasibility Check) will be done for both the outstanding items.
* Any impediment or blockers will be resolved to start the actual development.

**ALL TASK DONE IN THIS SPRINT**

**Second Sprint**

* 3 days 🡪 Making of faculty level reports.
* 3 days 🡪 Making of class level reports.
* 3 days 🡪 Making of student level reports.
* 2 day 🡪 Doing an integration testing for all those reports.

**THERE IS DELAY FOR 1 DAYS FOR EACH LEVEL REPORT**

**SO, TOTAL 3 DAYS OF DELAYED IN THIS SPRINT**

1. **Second Priority Sprint Planning**

**Third Sprint**

* 3 Days 🡪 Creation of new database as a backup of existing.
* 4 Days 🡪 Establishing the connection between primary and backup database.
* 5 Days 🡪 Testing the backup database by manually failing the primary one.

**THERE IS DELAY FOR 2 DAYS**

**ON SEE ESTABLISHING CONNECTION TASK**

**Fourth Sprint**

* 3 Days 🡪 System to be able print all student in a class report card for lecturer.
* 2 Days 🡪 Report all student for certain semester for lecturer.
* 2 Days 🡪 Download one file given by the lecturer.
* 3 Days 🡪 Able to see overall grades from the very first semester.
* 4 Days 🡪 Testing all development.

**THERE IS DELAY FOR 1 DAYS**

**ON SEE OVERALL STUDENT GRADES TASK**

1. **Third Priority Sprint Planning**

**Fifth Sprint**

* 4 Days 🡪 Making an announcement for the resident of school.
* 3 Days 🡪 report of all the student and lecturer data.
* 2 Days 🡪 Report all activities in school.
* 5 Days 🡪 Testing all development.

**THERE IS DELAY FOR 1 DAYS**

**ON REPORT ALL ACTIVITIES IN SCHOOL TASK**

**Six Sprint**

* 5 Days 🡪 Report of all activities that happen in the school such as graduation day, school festival and so on.
* 1 Days 🡪 Administrator can add a new faculty member to the system and give him/her applicable privileges.
* 3 Days 🡪 Administrator able to assign the lecturer to various classes and assign students of a class to a particular student.
* 1 Days 🡪 Lecturer able to give the rights to teacher to upload the assignments.
* 5 Days 🡪 Testing all development.

**ALL TASK DONE IN THIS SPRINT**

1. **(LO 1, LO 2, 10 points)** Explain what your team did during the sprint review and sprint retrospective stages! Also explain the result differences at the two stages!

**Answer:**

1. **At Sprint Review Stages**

* **Some delay occurs during the sprint execution**.
* **Discuss What are the possible causes of the delay**, especially in the case of making the level reports, where the delay was quite large.
* **Also Discuss How to anticipate these problems in future**.

1. **Expansion of Functionality**

* New functionalities continue to be conceived and requested as the project proceeds. The software can never be completed in this way.

**Anticipation:** Signed the Memorandum of Understanding (MoU) and Memorandum of Agreement (MoA) between Stakeholders, Project Manager, and the Team.

1. **Overly Optimistic Schedules**

* Pressure on the project team because of the (unrealistic) deadlines. These attempts lead to sloppy work and more errors, which cause further delays.

**Anticipation:** Complete a project (more) quickly sometimes arises for primarily strategic reasons. If it is not feasible, however, it should not be attempted.

1. **Customers Fail to Fulfil Agreements**

* When customers do not react in a timely manner to areas in which they must be involved, projects can come to a standstill.

**Anticipation:** Give warnings max. 3 times to customer. If Fail the Agreement again, charge more money for the project or no accept other project from that customer again.

1. **Tension between Customers and Developers**

* Because the project is not proceeding quickly enough as it disturbs the necessary base of trust and the working atmosphere.

**Anticipation:** Because User involve in the Sprint, user must know detailed so the misunderstanding can be reduced.

1. **Mediocre Personnel**

* Insufficiently qualified personnel can cause project delays as do knowledge and skills in working together to play the game of the project.

**Anticipation:** Signed the Memorandum of Understanding (MoU) and Memorandum of Agreement (MoA) between Stakeholders, Project Manager, and the Team.

1. **At Sprint Retrospective Stages**

* **Identify insights what worked well, what didn’t work well and what are the opportunity to do things differently**.
* **Worked Well**
* Done a very good job In Sixth Sprint, all of them done completely without any delay.
* Done a very good job In Fourth Sprint. From 5 tasks, only 1 times delay and only for 1 days.
* Done a very good job In Fifth Sprint. From 4 tasks, only 1 times delay and only for 1 days.
* Done a very good job In First Sprint, all of them done completely without any delay.
* **Didn’t Work Well**
* Not very good at Second Sprint of The Development, because there is a lot of delay happened on that task total 3 days.
* Not very good at Third Sprint of The Development, because there is a lot of delay happened on that task total 2 days.
* There is some task that the person who work on that task had less knowledge and skills in that task.
* The lack of people to do on this project is because the time each task is made is very small, causing a lot of delay.
* **Opportunity to do Things Differently**
* Make Sprint Planning more flexible.
* This Project can be done using with Swarming Techniques.
* Recruit more people or the hours each task can be extended.

1. **(LO 1, LO 2, 10 points)** If Mrs. Alvina **wants to make changes to 'grading' feature** and she **already communicate it during the sprint review**. **What steps should you and your team take**? Describe in detail: the steps that can be selected and the possibilities that may be encountered!

**Answer:**

**Before taking actions**, I and my Team will **consider few important considerations, such as**:

1. **The size of the change**

* While taking a small change my enhance Agility, a big change may disrupt the Flow of the sprint. And will be end with Delayed result.

1. **The timing of the change**

* Example, “Grading” feature done in Sprint 4, but communicate the change in Sprint 6. Also can end with Delayed result.

1. **The source of change**

* **Is there a requirement that was missed by Product Owner?**
* If Yes, back to the point a, the size of change small or large can disrupt the performance flow of the sprint.
* If No, back to the point b, is the timing right to make a change to the features or not.
* **Is the change requested by customer after seeing the product?**
* If Yes, it could probably the Mistaken and Misunderstanding of the features of Development Team. Also back to point b again to consider.
* If No, of course back to point a, size of changes matters, are not quite out of the box from the MoU.

1. **The frequency of change:**

* If Product Owner giving half requirements and then changing frequently, consider point a and b, the size and time for the changes.

**In the end**, **accepting a change in the sprint is a negotiation** **between the Product Owner and the Development Team**, **with the final authority resting with the letter of MoU and MoA**.