**Question 1:**

Considering the specific situation and my role as a product owner, I propose the adoption of the **AGILE** development methodology due to the following reasons:

**I/ Requirements characteristics:**

- **Flexibility**: The requirements are not well-defined at the beginning of the project. Moreover, it is said that there will be many changes throughout the project.

- **Adaptability**: Because this is a completely new project that has never been developed before, it is a must to get users’ feedback. Then, based on that feedback, the project must adapt to the needs of users.

- The requirements have already included both functional and non-functional requirements

- It is said to have a testing period and a finished period so Agile is a suitable choice for this project.

**II/ *The second aspect pertains to the Development team:***

**+ Team composition:** The team comprises 4-5 extensive experience and skills developers and some support employees, rendering it well-suited for a project employing the Scrum development methodology.

**+ Effective collaboration and communication skills:** The team members share a common language, facilitating seamless communication and productive teamwork. This advantage significantly contributes to timely task completion.

**+ Proficiency in designated roles and responsibilities**: Each team member possesses a high level of expertise and experience in their assigned roles and responsibilities.

**+ Adaptability to changes:** The team demonstrates a robust ability to adapt to changing circumstances.

**III/ *The final aspect concerns user involvement in the project:***

**+ Project size:** Medium

**+ Extent of user engagement:** Considered large due to the project's focus on internal company use, primarily targeting employees. This significant user involvement stems from the project's scope.

In conclusion, based on the mentioned characteristics, I reiterate my recommendation for **the AGILE METHOD** as the most suitable approach for this project. This choice is grounded in the project's medium scale, intricate array of requirements, the critical need for early fault detection, and the methodology's applicability to projects characterized by initially unclear customer requirements...

Based on the description I provided earlier, **Scrum** appears to be the most suitable model. Here's how I implement it:

+ First, I gather all necessary requirements from team members to create a product backlog.

+ Next, my team and I hold a sprint planning meeting to define the goals and scope of the upcoming sprint. We prioritize items from the backlog and establish a detailed plan for the development activities during the sprint.

+  I plan to divide the project into 4 sprints, each lasting one to two weeks.

* **Sprint 1:** *Size Guides and Recommendations*
* **Sprint 2:** 360-Degree Product Views
* **Sprint 3:** High-Quality Product Images, Multiple Model Representation
* **Sprint 4:** Flexible Return and Exchange Polices

\* During each Sprint, my team will handle both development and testing simultaneously. This entails six developers dedicated to development tasks, while two quality assurance (QA) experts take charge of the testing process. Our front-end development is carried out using React, while backend development is accomplished using Node.js.

\*I have chosen to utilize Jira as the tool for project management and github to manage the code.

**Question 2:**

Suggested Testing Types and Levels for FU-NextExam

Unit Testing

* Executors: Developers
* Timing: Post-development of individual functions
* Objective: Verify the correctness of each unit of code in isolation

Integration Testing

* Executors: Development Team or Integration Testers
* Timing: Post-completion of module development
* Objective: Ensure that integrated modules operate cohesively

System Testing

* Executors: Quality Assurance Team
* Timing: After integration and before UAT
* Objective: Confirm that the system as a whole meets specified requirements

User Acceptance Testing (UAT)

* Executors: End Users/Stakeholders
* Timing: Before final deployment
* Objective: Validate the system against user requirements and expectations

**Question 3:**

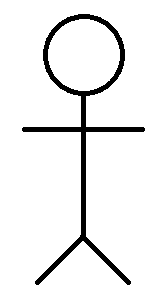
Four functional requirements:

* Import questions: The system shall allow Lecture can import questions from Excel file, manage his/her questions and progress tests.
* Import Student lists: The system shall allow Lecture can import student lists from the FAP system or from Excel files, assign class to an exam
* View list of exam: The system shall provide the ability for students to view a list of exam and join the exam. The student also can view test result after he/she finished the test
* Import lecturers’ information: The system shall provide the ability for Lecture leader to import lecturers’ information and assign role for lectures to a subject

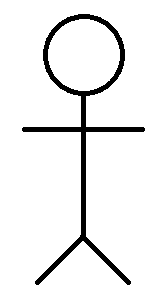
Two non-functional requirements:

* Authentication and Security:
  + - Users should log in using their FU's email account on the Gmail platform.
    - The system must prioritize secure authentication and data protection, adhering to information security standards.
* Performance and Reliability:
  + - The system must ensure high performance, robustness, and reliability.
    - It should handle multiple users concurrently, functioning effectively without crashes or unnecessary delays.

**Question 4:** USER CASE DIAGRAM:



Lecture leader



lecture

Lecture

**Question 5:**

Four test cases:

Test case 1:

+ Description: test performance of the system

+ Input : 10000 question to import question in this time.

+ Expected: All question import successfully.

+ Output: All question import successfully.

+ Exception: System inform error message “API Connection Fail"

Test case 2:

+ Description: Test layout for each device

+ Input: Open the screen of the system in a mobile device

+ Expected: Display successfully different layout for each device

+ Output: Display successfully different layout for each device

+ Exception: The UI does not meet the requirements.

Test case 3:

+ Description: Test export view list of exam.

+ Input: export all of the exam at the same time

+ Expected: all files of exam can be exported

+ Output: The system informs error message “error: server was disconnected"

+ Exception: The system informs error message “error: server was disconnected”

Test case 4:

+ Description: Test import lecturers’ information.

+ Input: import 1000 user(Lecture) in this time.

+ Expected: All question import successfully.

+ Output: All question import successfully.

+ Exception: System inform error message “API Connection Fail"

**Question 6:**

+At the lecture, I want to Import Questions, so that I can be easy to import my question to system and the student in my class can see and do it.

+At the lecture leader, I want to Import lecturers’ information, so that I can be easy to import lecturers’ information and assign role for lectures to a subject.

**Question 7:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **USER ROLE** | **Lecture** | | | | |
| **User activities** | Import question list | | Create a New Exam | | |
|  | Add question | Delete question | Create a New Exam | View Exam | Export to student |
| **Release 1** | Add question manually | Delete question manually | Automatically delete Exam if has issue | View Exam information | Can export exam to student |
|  | Show question for student by button | Auto remove question if has a identical question | Change Exam information manually | Customize the start and end day to view the exam | Select the start day and end day for the export |
|  |  | Alert when deleting a question |  |  |  |
| **Release 2** | Set daily add question for week, month | Use an assistant to help delete question | Change all daily Exam | Connect which other app to view bus routes (mail, zalo,… ) |  |
|  | Customize add question weekly or monthly | Automatically delete all the question if they leave FPT | Use assistant to help change Exam |  |  |