PROJECT PROPOSAL

Transport Management System (TMS) for ITL Logistics Group

PART 1: Quality Management

Quality management is crucial in the software development process, especially when adopting the Scrum framework. Scrum emphasizes iterative and incremental development, with frequent releases and feedback loops. In this dynamic environment, effective quality management ensures that the software meets the desired standards and satisfies customer expectations. Recognizing this importance, our team choose to adapt ISO 25010 framework for quality management.

Chosen characteristic: Reliability.

Characteristic and sub-characteristics details:

No.	Characteristics	Sub-Characteristics	Definition of Done criteria
1	Reliability	Availability	The feature should be accessible and responsive, downtime and unavailability must be significantly minimized to ensure 99.999% of availability.
2		Recoverability	At least 80% of the system's main functionalities must be able to operates normally after recovery from failure.
3		Maturity	The module functions must undergo SIT and UAT to operate reliably and consistently, and various scheduling scenarios must be tested to handle unexpected issues or failures.
4		Fault Tolerance	The feature's database needs to be replicated across a minimum of two regions. Additionally, scaling on demand should be implemented to handle any potential failures in the application server.

Metrics and Threshold for sub-characteristics

Sub-Characteristics	Metric	Threshold	Rationale
Availability	Uptime	99.999%	The feature should be operational and accessible for 99.999% of uptime period, experiencing minimal downtime.
Recoverability	Mean Time to Recover	< 1 hour	The average time take to restore the system to normal operation after a failure should be under 1 hour.
Maturity	Defect density	< 1.5 defects/KLOC	The number of defects identified per thousand lines of code (KLOC) should be under 1.5.
Fault Tolerance	Mean Time Between Failure	500 hours	The average time between two consecutive failures should be under 500 hours

PART 2: Detailed planning of activities

| No.	Sub-Characteristics	Definition of Done criteria	Status
1	General Tasks	Identify relevant quality standards for the feature.	Done
2		Develop detailed planning of activities to satisfy the identified qualities	Done
3		Conduct audits to verify compliance of the feature with quality processes.	In Progress
4		Identify areas for improvement and corrective actions	In Progress
5	Availability	Implement infrastructure redundancy by replicating the EC2 instance of the feature across at least 3 AZs using AWS Auto Scaling Service.	In Progress
6		Implement Load Balancing for the deployed instances using Application Load Balancer.	In Progress
7		Implement high availability for Amazon RDS by creating an additional Read Replica.	In Progress
8		Implement Amazon CloudTrail and Amazon CloudWatch for continuous monitor of system's health and performance.	In Planning
9		Implement Amazon SNS for timely notification to the administrators should incidents happen.	In Planning
10	Recoverability	Schedule daily incremental backup and weekly full backup for Amazon RDS.	In Progress
11		Implement function to push Amazon RDS backup to Amazon S3 Deep Glacier for regulatory compliance and disaster recovery.	In Progress
12		Automate recovery processes using AWS Lambda to recover RDS snapshot whenever necessary.	In Planning
13		Develop Incident response plan outlining steps, responsibility allocation, and necessary procedures to be taken when incident happens.	In Planning
14	Maturity	Perform code reviews and quality controls for the implemented feature.	In Progress
15		Use audit account and user account respectively to perform SIT and UAT on the feature.	In Progress
16	Fault Tolerance	Ensure that EC2 instances span across at least 3 AZs	In Progress
17		Ensure that Amazon RDS span across at least 2 AZs	In Progress
18		Ensure that errors are timely reported and fixed.	In Progress

Trello Dashboard
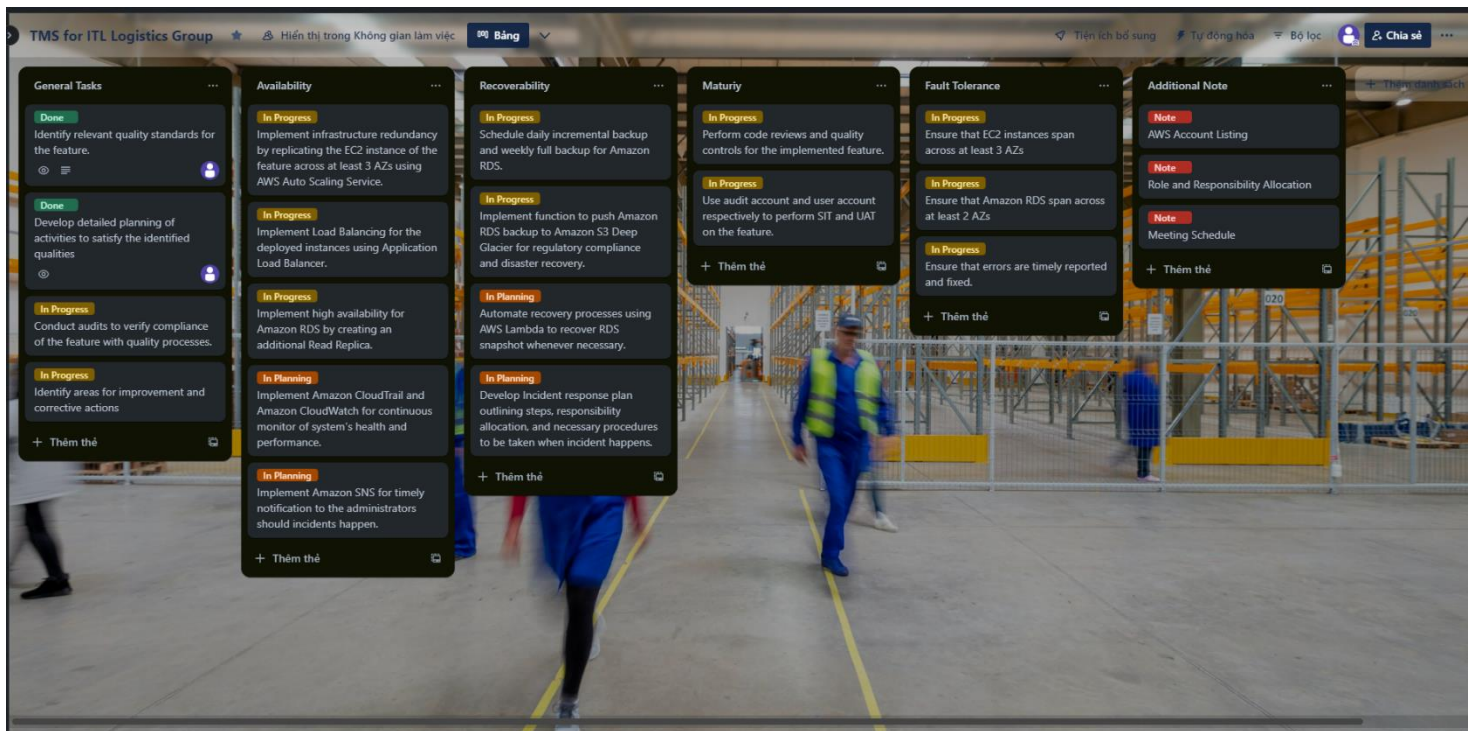
Figure 1: Trello Dashboard for Sprint 1

Rationale

The project has made significant progress in achieving the desired qualities for the chosen feature. The identification of relevant quality standards and the development of a detailed plan have been completed. Audits to verify compliance and the identification of areas for improvement are currently in progress.

For availability, the project is implementing infrastructure redundancy and load balancing across multiple availability zones. High availability for Amazon RDS is being addressed by creating an additional Read Replica. Continuous monitoring of system health and performance is planned using Amazon CloudTrail and Amazon CloudWatch, along with timely notifications through Amazon SNS.

To ensure recoverability, daily incremental backups and weekly full backups for Amazon RDS are being scheduled. The project is also working on pushing RDS backups to Amazon S3 Deep Glacier for regulatory compliance and implementing automated recovery processes using AWS Lambda.

For maturity, code reviewing quality controls are underway, and system integration testing (SIT) and user acceptance testing (UAT) are being planned.

To achieve fault tolerance, efforts are being made to ensure that EC2 instances span across multiple availability zones, and Amazon RDS spans across at least two availability zones. Timely error reporting and fixing are also being addressed.

Overall, the project is taking comprehensive measures to meet the desired qualities of the feature, with several activities completed and others in progress.