ProCP – Project Plan

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Project statement:

a. Client: Joe Laro

b. Project leader: Artemiy Chervinskyy. **Team members:** Ana Cirnu, Robert Andreescu, Andrei Frujina, Qi-Mo Lin, Ignas Apsega.

c. Current situation: Currently, the airport's management team has no automated or viable means to properly allocate resources to ensure an optimal flow of the baggage handling system. However, there is a limited amount of staff available for carrying luggage from the airport to the planes using carts and then bringing the carts back to the airport.

d. Problem description: The client requested to create a simulation of the airport baggage management system. Our application will simulate the journey of the luggage and the baggage sorting area of the airport which is capable of moving pieces of luggage to the plane.

e. Project goal: We are aiming to build an application that is able to simulate the movement of luggage within the belt system of an airport, as well as display the statistics regarding the number of carts and employees needed to transport the bags to the planes. The amount of bags should be inputted by the user, who also has the freedom to create the belt system (the user can create up to 6 belts within a simulation). Also, the application should define the shortest path a bag should follow after it has reached the sorting area - path to the gate. The sorting area should not be visible to the user by default.

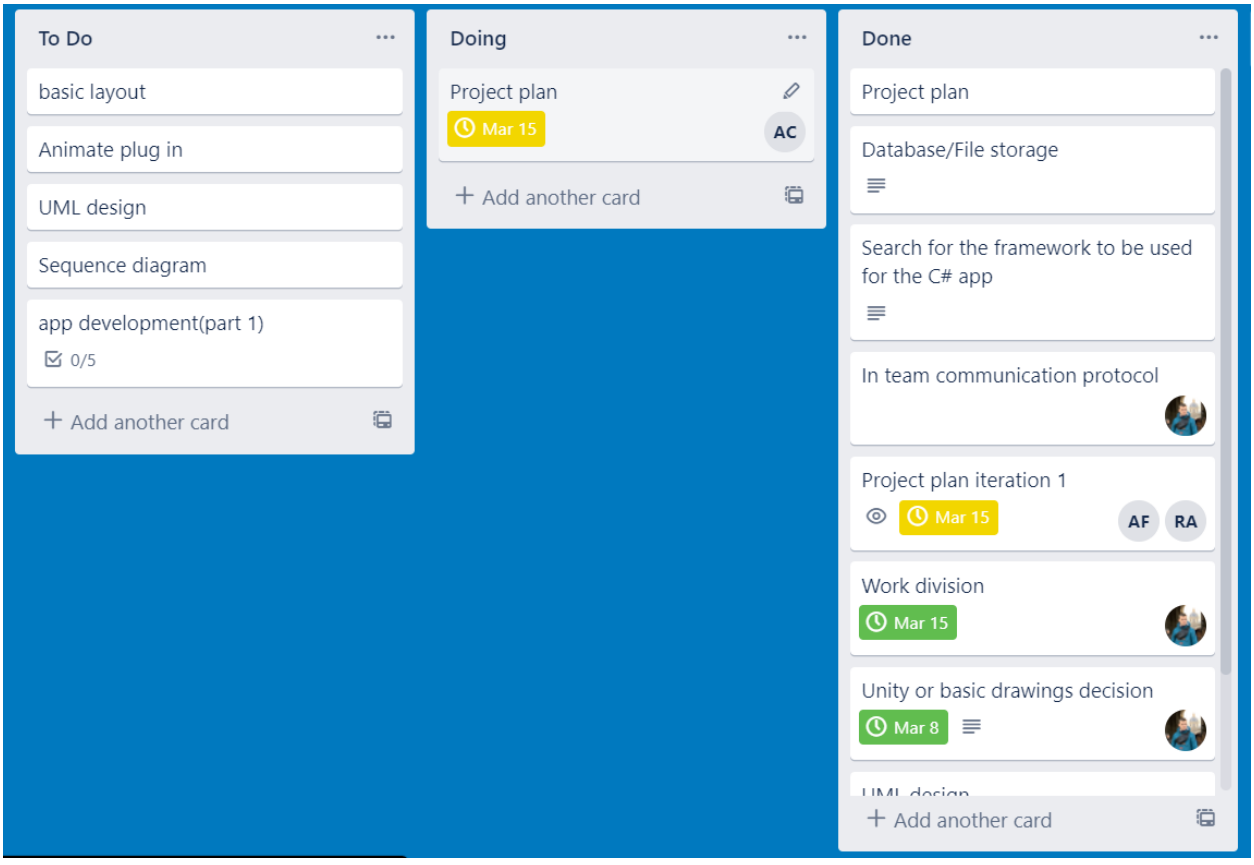
Sprint 1:

Sprint goal: The end goal of this sprint is to build an application that can showcase to the client the look and feel of the final app and also portray a basic version of the main features of the complete product. It should feature the following requirements:

- The result of a given simulation, represented in the form of statistics, which will be shown at the end of the simulation.
- The application starts with only one straight baggage belt and runs like so, with no option to change the belt system yet.
- The user will be able to enter the number of planes, passengers, and pieces of baggage per simulation before they start the simulation. These settings cannot be altered during the run of the simulation.
- The simulation will be finite.

Phasing:

State at the beginning of the sprint:



Week 1

Goal: Define the Simulation area (part of the app that will be displaying the airport).
Steps to be taken:

1. Create a draft version of the UMLs
2. Belt drawing in the picture box
3. Creating a component of 3 picture boxes communicating together
4. Control start of the app (functionality of “Start” button)
5. Define simulation objects such as:
    a. Piece of baggage
    b. Passenger

Deliverables: none

Week 2

Goal: Make documentation for the current solution, support it with UMLs, add minor improvements
Steps to be taken:

1. Define class relation in the existing solution
2. Recreate UMLs in case if needed
3. Add input fields to the current solution

Deliverables: none

Week 3

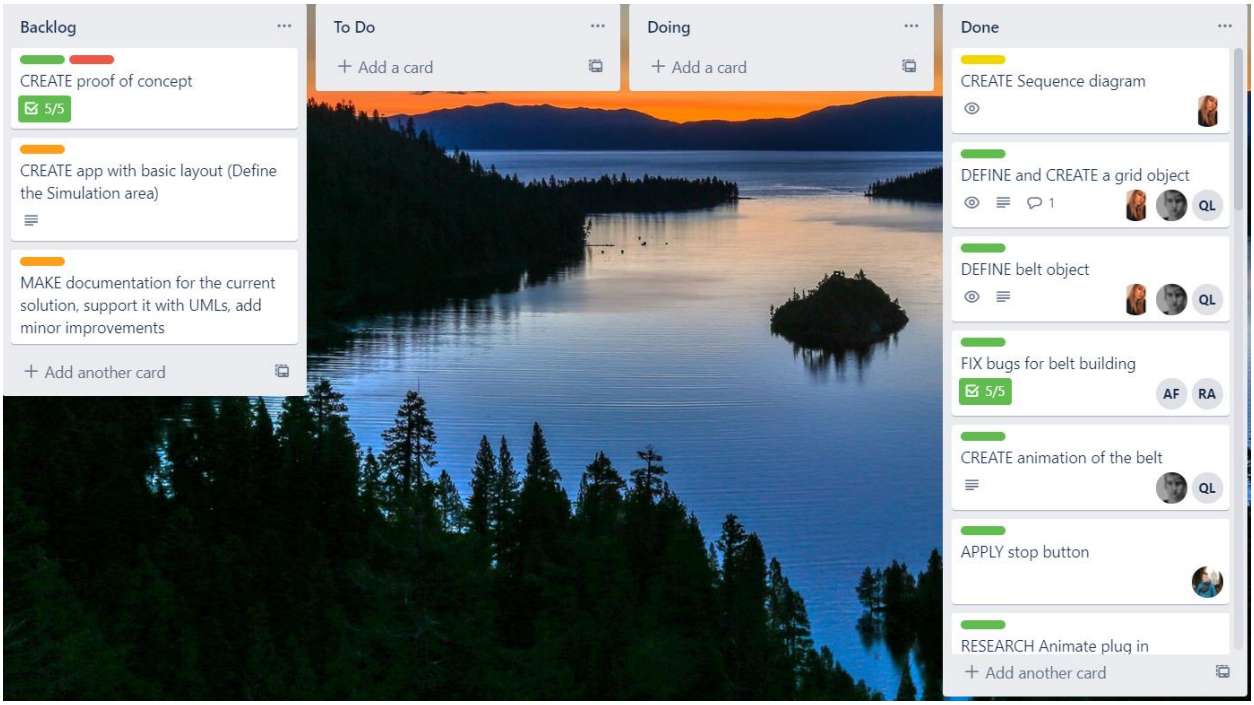
Goal: Animation of the belt object and error handling
Steps to be taken: to be defined
Deliverables:

1. Final URS for sprint 1;
2. The final version of the plan for sprint 2;
3. Source code of proof of concept;
4. Proof of concept;
5. The updated version of work division report.

Week 4

Goal: Prepare the proof of concept
Deliverables: UML Class diagram(s) & non-trivial sequence diagram(s) of proof of concept

State at the end of the sprint:



Sprint 2:

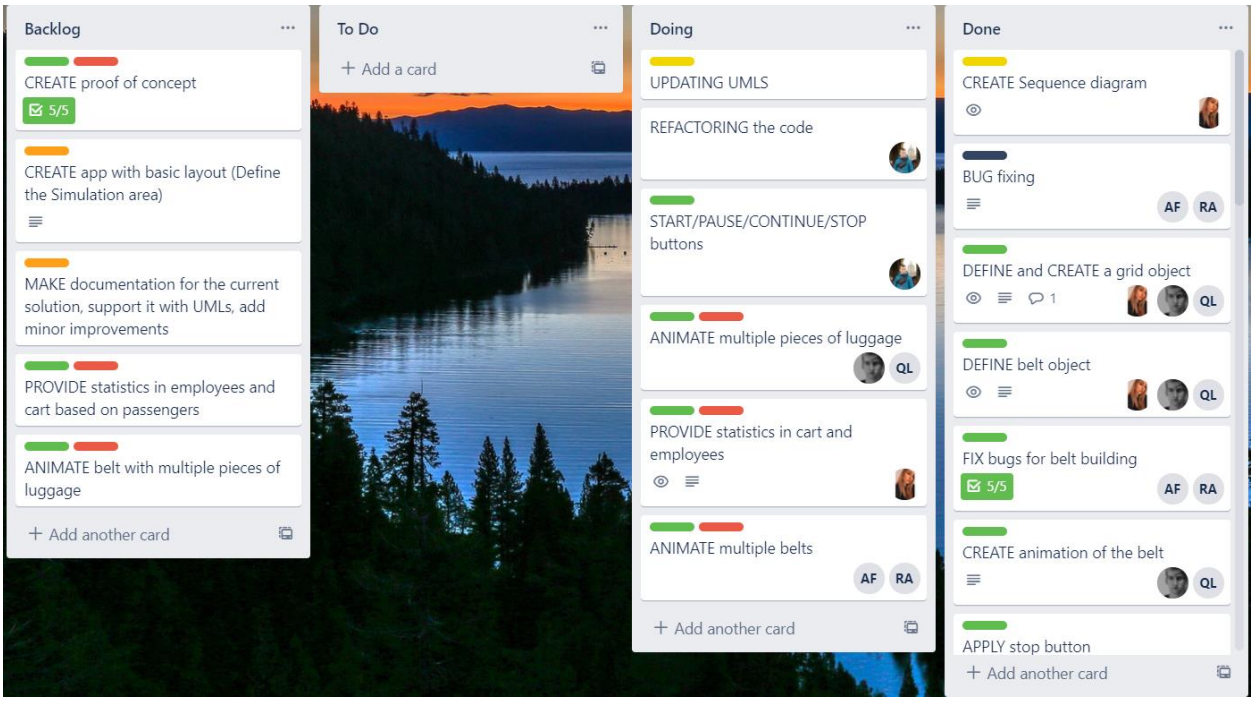
Sprint goal: The end goal of this sprint is to improve our proof of concept by adding the following functionalities:

- providing statistics in terms of number of carts used for carrying the luggage and the number of employees transporting the carts to the plane, based on the number of passengers coming into the airport
- belt animation which can support multiple pieces of luggage
- building multiple belts in one simulation

Phasing:

State at the beginning of the sprint: Currently, the most important functionalities of the application are: the animation of one belt carrying a piece of luggage, flexibility for the user regarding the construction of the belt, as well as a pathfinding algorithm, which predicts how a belt should look like in case the user doesn't finish building it before hitting the "Start" button. The latter prevents any kind of errors before the simulation begins.

State at the end of the sprint:



Sprint 3:

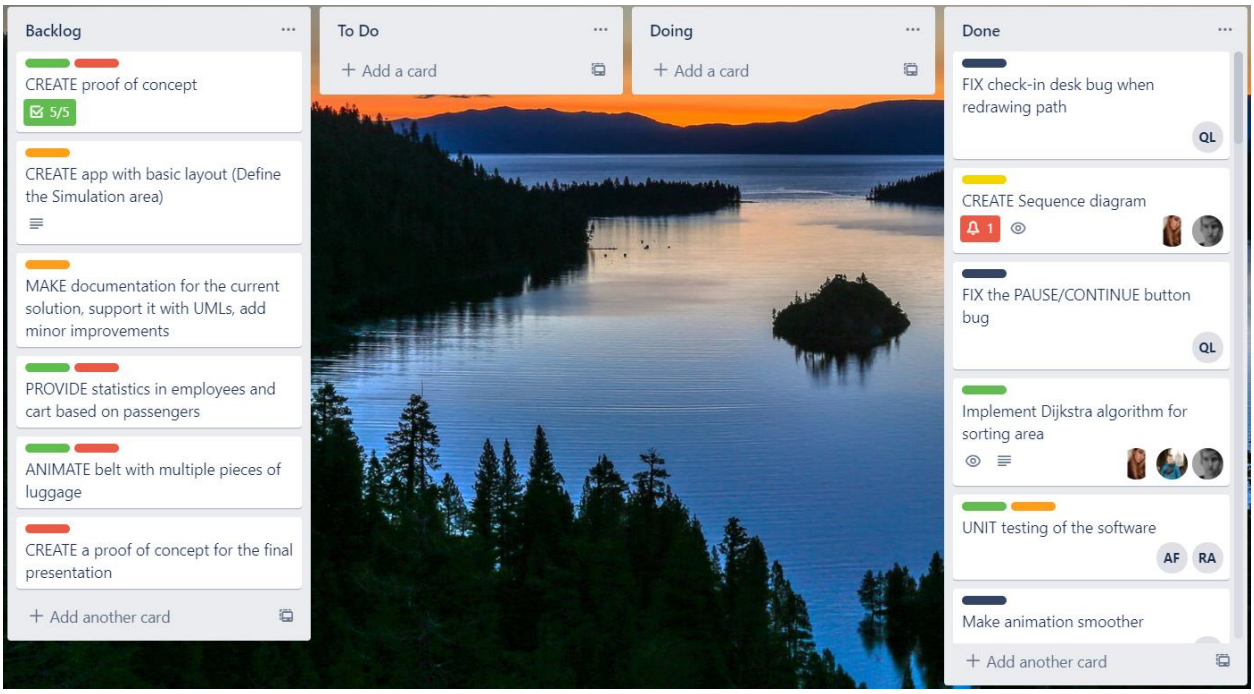
Sprint goal: The end goal of this sprint is to improve our proof of concept by adding the following functionalities:

- Unit testing
- Increase/decrease luggage speed
- Make the transitioning of a bag from one piece of the belt to another smoother
- Display the sorting of the bags in real-time in the simulation
- Use the shortest path algorithm to find the most optimal path a bag must follow inside the sorting area
- Improve the statistics by adding icons and displaying the numbers in real-time, not after the simulation has ended

Phasing:

State at the beginning of the sprint: Currently, the most important functionalities to be implemented are the shortest path algorithm, which will be used in the sorting area (not available to the user), an improved version of the statistics (transparency in icons and symbols used to display the results of the simulation), a smoother animation, the ability to control the simulation speed and unit tests.

State at the end of the sprint:



Finally, we have achieved our goal and we have also added the animation of multiple belts.