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## **DP2 – Analysis Report**

**Group:** C2.027  
**Repository:** <https://github.com/DP2-C1-027/AirNav-Logistics-C2>  
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## **Executive Summary**

This analysis report presents an analysis of key project requirements that require further evaluation to ensure effective implementation. Not all requirements require a detailed analysis, only those that involve significant decisions, technical considerations, or potential challenges are examined in depth.

## **Revision Table**

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| --- | --- | --- |
| **Revision Number** | **Date** | **Description** |
| 1.0 | 02/17/2025 | Initial version of the document |
| 1.1 | 03/11/2025 | Added entries related with deliverable D02. |
| 1.2 | 30/03/2025 | Added entries related with deliverable D03. |
| 1.3 | 04/07/2025 | Added entries related with deliverable C2. |

## **Introduction**

This document presents the Analysis Report for the DP2 project, developed by Group C1.027. The purpose of this report is to evaluate individual key project requirements to ensure their effective implementation. While not all requirements require extensive analysis, those that involve significant decisions, technical complexities, or portential challenges are examined in detail.

By conducting this analysis, I aim to strengthen the overall quality of the project deliverables, mitigate risks associated with requirement misinterpretation, and facilitate smooth project execution. This report is structured as follows: an executive summary outlining the key findings, a revision table documenting updates to the report, the detailed analysis of selected requirements, and final conclusions summarizing key takeaways and proposed adjustments.

## **Content**

1. Produce an analysis report.

This report is essential to record the decisions taken throughout the development, justifying technical and methodological approaches. It should include clear references to the requirements evaluated, decisions taken and their validation.

This requirement is important to take into account since it will be modified throughout the deliveries.

1. Produce a planning and progress report.

This report requires hard tracking of time and resources to properly estimate budget and progress. Can be complex if an efficient management tool is not used to record and visualize project status. Conflicts within the team must be resolved in a coordinated and effective manner to avoid negative impacts on the evaluation.

This requirement is important to take into account since it will be modified throughout the deliveries.

1. The system must handle flight crew member dashboards with the following indicators:

* The last five destinations to which they have been assigned.
* The number of legs that have an activity log record with an incident severity ranging from 0 up to 3, 4 up to 7, and 8 up to 10.
* The crew members who were assigned with him or her in their last leg.
* Their flight assignments grouped by their statuses.
* The average, minimum, maximum, and standard deviation of the number of flight assignments they had in the last month.

This requirement facilitates operational management and improves the crew experience by providing immediate access to relevant data. However, its implementation involves the integration of multiple data sources and constant updating to ensure accuracy.

Benefits include improved resource planning and greater control over flight allocation. However, its success depends on a clear interface and an efficient architecture to process large volumes of information without affecting system performance.

1. The system is required to provide crew members with information about visa requirements. A web service must be used to populate this entity with information about visa requirements. Thus, the exact data to store depends on the chosen service, and it is the students' responsibility to define them accordingly. It is also the students’ responsibility to find the appropriate service; no implicit or explicit liabilities shall be covered by the University of Seville or their individual affiliates if the students hire pay-per-use services! The students are strongly advised to ensure that the service they choose is free of charge.

This requirement simplifies the planning of international flights, avoiding migration problems for the crew. However, its implementation presents challenges, such as dependence on an external provider, possible API changes and the need to update data regularly.

While it automates visa queries and reduces the administrative burden, a poor choice of service can compromise the reliability of the information. Therefore, it is crucial to select a reliable source and ensure efficient integration within the system.

5) Operations by flight crew members on flight assignments:

* List the flight assignments separately, one for completed flight legs and another one for those planned but that have not taken place yet.
* Show the details of their flight assignments and the associated legs and flight crew members.
* Create, update, and publish their flight assignments. Only crew members with duty “LEAD ATTENDANT” can perform these operations. Please, note that to publish a flight assignment these cannot be linked to legs that have already occurred. Additionally, only flight crew members with an "AVAILABLE" status can be assigned to a leg, and they cannot be assigned to multiple legs simultaneously. Lastly, each leg can only have one pilot and one co-pilot. The allocation of remaining roles for other flight crew members is at the discretion of the “LEAD ATTENDANT”. Flight assignments can be updated or deleted as long as they have not been published.

This requirement introduces multiple restrictions on the management of flight assignments, such as the need for only the “LEAD ATTENDANT” to be able to create, update and publish assignments. But this requirement was removed by the customer has was intended to not be necessary. In addition, only flight crew members with “AVAILABLE” status can be assigned to a flight segment, and a segment cannot have more than one pilot and one co-pilot. Constant validation of flight crew member status and assignment restrictions are required to avoid inconsistencies.

The restriction of not being able to publish assignments linked to flights that have already occurred implies additional controls on the publication logic. Rigorous control over assignments is maintained, avoiding schedule conflicts or overassignments. The rigidity of the rules may hinder last minute changes, which could affect operability in case of unforeseen events.

6) Operations by flight crew members on activity log records:

* List the activity log records in their flight assignments.
* Show the details of their activity log records.
* Create, update, delete and publish activity log records. They cannot be published if their corresponding flight assignments have not been published yet. No updating or deletion is possible once an activity log record has been published.

Dependencies are established between activity records and flight assignments, since records cannot be published without the corresponding assignment having been published. In addition, once published, an activity record cannot be modified or deleted. Managing dependencies between entities can be complex, as it must be ensured that publications occur in the correct order.

The immutability of published records can generate problems if corrections are required. It can generate problems in case of data entry errors, since subsequent editing is not allowed.

## **Second Call Evaluation Content C2**

1. Implement ValidIdentifier Annotation:

The system must enforce unique identifier validation through custom annotations for both crew members and flight assignments. This validation must occur before any persistence operations.

This requirement significantly improves data integrity but introduces complexity in annotation processing and framework integration. The implementation must be thoroughly tested to avoid conflicts with existing validation logic.

1. Fix Flight Assignment Publishing Logic:

The system must properly validate and publish conflict-free flight assignments while respecting all business rules regarding crew availability and time slot constraints.

This requirement is technically challenging as it involves complex temporal logic and multiple validation checks. Special attention must be paid to edge cases where assignments nearly overlap or crew status changes during processing.

1. Redo Test Suite for Requirements #8 and #9:

The system requires comprehensive automated testing for flight assignment and activity log functionality. Tests must cover normal operations, edge cases, and failure scenarios.

This requirement is essential for maintaining system reliability but demands significant effort to achieve proper test coverage. The team must balance thoroughness with maintainability of the test suite.

## **Conclusions**

After analyzing the requirements, certain aspects were identified that require adjustments to improve their clarity, consistency and technical feasibility. In addition, inconsistencies were found between certain requirements, which could affect the implementation of the system if they are not properly aligned. Aspected were also identified that require additional validation by the teacher to ensure compliance. The proposed modifications seek to optimize the accuracy of the requirements and facilitate their traceability in future phases of the project.

For D02 delivery, both requirements present challenges. The dashboard requires real-time data processing without impacting performance, and the visa information relies on an external service whose reliability must be guaranteed.

For D03 delivery, requirements 8 and 9 revealed key challenges related to dependencies, data integrity, and usability. Additionally, the limitation on flight crew members availability lacks clarity regarding time frame constraints, which could cause conflicts in scheduling. To address these challenges, improvements such as automated validation checks, emergency overrides for role-based restrictions, and controlled amendments to published logs were required. These adjustments aim to maintain compliance with business rules.

In the C2 release, a lot of things have been changed in the project, many bugs and errors that we found during the development have been fixed. It has been a very tedious and intense delivery, since the development time has been very short.

## **Bibliography**

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