Analysis Report

Acme AirNav Solutions, Inc

Group Number: C1.066
Repository: `https://github.com/mquirosq/DP2-C1.066`

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Contents

Executive Summary

This document is a collection of records of the analysis that was conducted to the requirements corresponding to Delivery 02 of Student #2. Only requirements needing some analysis are included. Each record contains a verbatim copy of the original requirement, a detailed analysis of possible solutions with their advantages and disadvantages, and decisions made to refine the requirements. Additionally, a link to the validation performed by the lecturer is provided.

The main issues identified involved the ranges and constraints of the information requirements. These ambiguities were clarified by the client, allowing me to properly test their boundary in the sample data. Furthermore, clarification was provided regarding the relationship between passengers and bookings. Finally, it was determined to be a many-to-many relationship, which will be modeled using an intermediate entity called `BookingRecord`.

Revision History

Revision	Date	Description
1.0	2025-02-28	Initial draft
1.1	2025-03-13	Added analysis

1. Introduction

The purpose of this document is to provide a comprehensive analysis of the requirements that required clarification for Delivery 02 of Student #2 [1]. This analysis aims to clarify ambiguities and address potential issues. Only requirements that required further evaluation have been included.

For each analyzed requirement, an analysis record has been documented, consisting of:

- A verbatim copy of the original requirement for reference.
- An description of the issues or ambiguities encountered.
- An analysis of potential solutions considered, including the advantages and disadvantages of each approach.
- A final decision made regarding the issue.
- A link to the validation performed by the lecturer, confirming correctness and applicability of the modifications.

This report is structured to ensure transparency in the decision-making process and serves as documentation for future reference.

2. Analysis Records

2.1. Requirement 3

The following requirement will be analyzed:

'Customers are the people who purchase flights. The system must store the following data about them: an identifier (unique, pattern "`^[A-Z]{2,3}\d{6}$`", where the first two or three letters correspond to their initials), a phone number (pattern "`^\+?\d{6,15}$`"), a physical address (up to 255 characters), plus a city and a country (both up to 50 characters). Optionally, customers may have some earned points (up to 500k points).'

2.1.1 First analysis

The issue of missing ranges is common challenge in requirement elicitation documents. Explicitly defining these ranges is very important in order to properly test attribute constraints within the application. Therefore, we requested the customer clarification regarding these missing ranges.

To facilitate this process, we provided the client with an Excel file containing a table for each entity. Each table contained the expected data types and range constraints. Values explicitly defined in the original requirements were highlighted in green, while those requiring further clarification were marked in orange, as it can be seen in Figure 1.

Requisito 3 (ESTUDIANTE 2) - Customer			
Atributo	**Mínimo**	**Máximo**	**Tipo**
identifier	8	9	String (Specified in Pattern)
phoneNumber	6	16	String (Specified in Pattern)
physicalAddress	?	255	String
city	?	50	String
country	?	50	String
earnedPoints	?	500000	Integer?

Figure 1: Excel table provided to the client for the Customer role

The client reviewed these constraints and clarified the ambiguities in yellow, as shown in Figure 2.

Requisito 3 (ESTUDIANTE 2) - Customer			
Atributo	**Mínimo**	**Máximo**	**Tipo**
identifier	8	9	String (Specified in Pattern)
phoneNumber	6	16	String (Specified in Pattern)
physicalAddress	1	255	String
city	1	50	String
country	1	50	String
earnedPoints	0	500000	Integer

Figure 2: Excel table filled in by the client for the Customer role

The validation performed by the lecturer can be found in the following link: link.

2.2. Requirement 4

The following requirement will be analyzed:

"A booking is a reservation made by a customer to purchase a flight, guaranteeing some seats on a specific itinerary and associating some passengers' details with the trip. The system must manage the following information for each booking: a locator code (unique, pattern "`^[A-Z0-9]{6,8}$`"), a purchase moment (in the past), a travel class ("ECONOMY", BUSINESS"), and a price. Optionally, the system should record the last nibble of the credit card used for payment."

2.2.1 First analysis

Once again, some ranges in requirements were ambiguous, so they had to be clarified by the client.

The table shown in Figure 3 shows the initial table sent to the customer. Values explicitly defined in the original requirement were highlighted in green, while those requiring further clarification were marked in orange.

Requisito 4 (ESTUDIANTE 2) - Booking			
Atributo	**Mínimo**	**Máximo**	**Tipo**
locatorCode	6	8	String (Specified in Pattern)
purchaseMoment	?	?	Date/DateTime
travelClass	No range?	No range?	Enum ("ECONOMY", "BUSINESS")
price	?	?	Double/Money (?)
lastCardNibble	4?	4?	String (Pattern?)

Figure 3: Excel table provided to the client for the Booking entity

The client reviewed these constraints and clarified the ambiguities in yellow, as shown in Figure 4.

Requisito 4 (ESTUDIANTE 2) - Booking				
Atributo	**Mínimo**	**Máximo**	**Tipo**	
locatorCode	6	8	String (Specified in Pattern)	
purchaseMoment	2000/01/01 00:00:00	CURRENT MOMENT	Date	In the past
travelClass	-	-	Enum ("ECONOMY", "BUSINESS")	
price	1000000 XXX	0.00 XXX	Money	
lastCardNibble	4?	4?	String (Pattern?)	

Figure 4: Excel table filled in by the client for the Booking entity

The validation performed by the lecturer can be found in the following link: link.

2.2.2 Second analysis

The requirement mentions that a booking guarantees seats in an itinerary. However, it does not specify if the system has to store information regarding these seats. Several alternatives were considered:

- Alternative 1: Store information regarding seats, for example the seat number.
  - Advantages: Ensures the system stores potentially useful data.
  - Disadvantages: Introduces additional storage for information that may not be necessary.

- Alternative 2: Do not store information regarding seats.
  - Advantages: Prevents storing unnecessary data.
  - Disadvantages: Risk of not storing relevant information.

Finally, the client determined that seat information was unnecessary, as passengers do not have pre-assigned seats on charter flights, the client's area of specialization.

The validation performed by the lecturer can be found in the following link: link.

2.3. Requirement 5

The following requirement will be analyzed:

"A passenger is an individual who takes a flight and he or she must be registered in the corresponding booking. The system must store the following data about passengers: a full name (shorter than 256 characters), an email, a passport number (pattern "`^[A-Z0-9]{6,9}$`"), a date of birth, and, optionally, his or her special needs (shorter than 51 characters)."

2.3.1 First analysis

Some ranges in requirements were ambiguous, so they had to be clarified by the client.

The table shown in Figure 5 shows the initial table sent to the customer. Values explicitly defined in the original requirement were highlighted in green, while those requiring further clarification were marked in orange.

Requisito 5 (ESTUDIANTE 2) - Passenger				
Atributo	**Máximo**	**Mínimo**	**Tipo**	
fullName	255	?	String	
email	?	?	String	Validate with ValidEmail?
passportNumber	9	6	String (Specified in Pattern)	
dateOfBirth	?	?	Date	In the past?
specialNeeds	50	?	String	

Figure 5: Excel table provided to the client for the Passenger entity

The client reviewed these constraints and clarified the ambiguities in yellow, as shown in Figure 6.

Requisito 5 (ESTUDIANTE 2) - Passenger				
Atributo	**Mínimo**	**Máximo**	**Tipo**	
fullName	1	255	String	
email	255	0	String	Validate with ValidEmail?
passportNumber	-	-	String (Specified in Pattern)	
dateOfBirth	2000/01/01 00:00:00	CURRENT MOMENT	Date	In the past
specialNeeds	0	50	String	

Figure 6: Excel table filled in by the client for the Passenger entity

The validation performed by the lecturer can be found in the following link: link.

2.3.2 Second analysis

The requirements state that a passenger must be registered in a booking. However, the nature of this relationship is ambiguous, particularly regarding whether a passenger can be associated with one or multiple bookings.

- Alternative 1: A passenger may be associated with only one booking.
  - Advantages: Introduces a straightforward many-to-one relationship between Booking and Passenger.
  - Disadvantages: If the same person appears on multiple bookings, duplicate passengers with identical information would be created.
- Alternative 2: A passenger can be associated with multiple bookings, and a booking can include multiple passengers.
  - Advantages: Ensures that each passenger is only stored once, reducing redundancy.
  - Disadvantages: Requires an intermediate entity to model the many-to-many relationship between Passenger and Booking.

Finally, the lecturers clarified that Alternative 2 was best aligned with the requirements, as a passenger may be included in multiple bookings. A intermediate entity "Booking Record" will be created to model the many-to-many relationship.

The validation performed by the lecturer can be found in the following link: link.

3. Conclusions

The analysis recorded in this document provides a detailed evaluation of the requirements for Delivery 02 of Student #2 [1], identifying ambiguities and problems, assessing

potential solutions, and making informed decisions to improve the understanding of requirements and progress towards the goal.

Each analysis was recorded in a structured manner, ensuring that the final conclusion was approved by the lecturer. By documenting the original requirements, issues encountered, considered solutions and final decisions, this report serves as a transparent reference of the decision-making process. Additionally, the lecturer's approval serves to validate the final decision made, ensuring correctness and feasibility.

The analysis records provide a clear justification for the decisions made. Moving forward, these decisions will serve as a solid foundation for implementing the requirements as originally intended by the lecturers, ensuring accuracy and minimizing unnecessary errors and confusion.

References

[1] *02 - Requirements – Student #2*, Enseñanza Virtual, 2025. Available on Enseñanza Virtual in the course inside the Project Statement folder.