

Airport Taxi Scheduling Project Requirements Specification according to IEEE 830 standard

November 29, 2022 - December 19, 2023

Summary

This document presents, in English, the necessary requirements for the development of the first prototype of the "Airport Taxi Scheduling" program this must contain all the information specified in the IEEE 830 standard.

Index

November 29, 2022	1
1. Introduction	3
1.1. Purpose	3
1.2. Scope of System	3
1.3. Definitions, Acronyms and Abbreviations	3
1.4. References	4
1.5. Overview of Document	5
2. Overview	5
2.1. Product Perspective	5
2.2. Product Functions	5
2.3. User Characteristics	6
2.4. Restrictions	6
2.5. Assumptions and Dependencies	6
2.6. Future Requirements	7
3. Specific requirements	7
3.1. External Interfaces	13
3.2. Functions	13
3.3. Performance Requirements	14
3.4. Design Restrictions	14
3.5. System Attributes	14
3.6. Other requirements	Error! Bookmark not defined.
4. Appendices	14

1. Introduction

When we talk about transport services, passengers, whether new or regular, need information about this such as schedules, in turn the driver, specify the process of payments and future trips. In order to optimize the process, it is necessary to implement a more pleasant service with the passenger and the taxi driver.

1.1. Purpose

This document is aimed at the taxi and passenger service that seeks to optimize transport, service and travel processes for users and for the taxi unit driver himself who shares the idea of adapting his service to the new needs of using a programmed system with his database.

1.2. Scope of the System

In this subsection:

- Airport Taxi Scheduling
- Optimize and implement new registration processes and the storage of new and frequent passenger information for upcoming trips that allows to provide the service of electronic invoices and collections in cash or through bank transfers to passengers, additionally congratulate them on special dates.
- Improve passenger service and facilitate processes to taxi service.
- This document is referenced in a previous Project Definition document explaining in more detail how the programme will be carried out.

1.3. Definitions, Acronyms and Abbreviations

-What is an Electronic Invoicing

The electronic invoice is a digital and legal document that guarantees the commercial operation between two parties, one that offers a product or service and another that acquired it, in such a way that the cost of what was purchased with their respective taxes is broken down based on the legislation of each country.

-What is a Registry

In computing, or specifically in the context of a relational database, a record represents a single object of implicitly structured data in a table.

-What is a Database

A database is a tool for collecting and organizing information. Databases can store information about people, products, orders, or other things. Many databases begin as a list in a spreadsheet or word processing program.

-What is a Qr

A QR code is an improved version of the classic barcodes, which only represent a numeric code. It has a square shape and is composed of delimiters that allow the reader to know where the content of the code is. In some cases the outside is usually chord with boxes similar to the code to give it a shape that is not square, but this information is ignored by the reader. The QR codes will serve us, in this case, to provide the passenger with more information about the driver who will serve him, this through his cell phone, just by scanning the QR code.

-What is a Reminder

It is a message or notification that has the function of remembering, warning about an upcoming event of great relevance since the human being can forget certain important and specific data. In our case we usually have several races at the same time of which we need external help to help us not forget any important data and date.

-How are the Airport Rates or

A price list that provides knowledge to the passenger of the cost of a race depending on the location of departure and destination. It is important to mention that this is not imposed on benefits of the driver but was arranged by the company that manages the airport taxi service with prices available to passengers.

-What is a Race at the Airport

The main clients usually tend to be tourists, travelers who first traveled by plane but when wanting to move from the airport need a safer means of transport. This need is solved with the taxi service that makes trips to the entire equator. Usually travelers want to stay in recognized hotels that are mainly located in the city of Quito. Sometimes they ask for a tour to get to know the city.

1.4. References

The references executed in the project were only based on the interview with the project client based on user citations.

1.5. Document Overview

A QR code was provided in which the driver's cover letter to passengers will be stored. At the end of each trip the payment is recorded in the system either in cash or transfer with date and time. To schedule its the driver requires to insert the data (name, mobile number, email and optional date of birth) manually that will be stored in a database to optimize future trips also has to be able to schedule and cancel trips with a nticipación, in addition to sending reminders to frequent passengers with outstanding balances. Once the payment is registered, an electronic invoice is generated that is sent to the passenger's email.

The system at the end of each day the driver can be viewed in a history of the races made per day and at the end of each month an economic report of the trips made will be displayed.

2. Overview

2.1. Product Perspective

The perspective that exists of the product is that it seeks to improve taxi transport services at the airport and how this can influence the organization of passengers. This project is completely independent of larger projects because it works with its own data and prints the same when requested.

2.2. Product Features

Its functions are to show the method of payments between the passenger and the taxi driver and the check-in. So, we talk about that at the end of each trip, the payment you give registered in the system and can be in cash or transfer with date and time. To schedule them, drivers must manually enter data (name, mobile phone number, email and optional date of birth) that will be stored in a database to optimize future trips. It also has the ability to schedule and cancel trips in advance, as well as send reminders to frequent travelers with outstanding balances. Once the payment is registered, an electronic invoice is generated and sent to the passenger's mailbox. At the end of each day, drivers will be able to consult a history of races made each day and at the end of each month an economic report of the trips mad

2.3. User Characteristics

The characteristics of the users are:

- They will be people who have real personal data
- Basic educational level
- Reliable payment methods
- They may or may not have experience in taxi transport travel.

2.4. Restrictions

Limitations that are imposed on the developers of the product:

- Hardware limitations
- Parallel operations
- Auditor duties
- Control functions
- Programming language(s)
- Communication protocols
- Skill Requirements
- Criticality of the application
- Security considerations

2.5. Assumptions and Dependencies

The whole program starts from the "TaxiDriver" of this depends on entering the data and manipulating it in the "DataBase". The "DataBase" will create classes that will serve to collect data such as "Traveler" which are all the personal data of the passenger, and this in turn will validate the payments of each passenger assigning each one their corresponding data. Another example is that the "DataBase" creates a message service that sends each passenger a congratulatory message on their birthday after collecting the data of the dates of birth.

2.6. Future Requirements

Thinking about the future we noticed that some improvements would not hurt the project, things like linking with banks or financial institutions to use card payment methods or electronic payments. In addition, betterar the user interface so that it can better relate to the program and also the taxi driver, and finally add more options and functionalities so that the program becomes more versatile and does not leave disappointments in users.

3. Specific Requirements

Main Requirements:

The Laptop Preference System

1. Schedule of the race of frequent and new passengers (Reminder and warnings-schedules)

Scheduling the career of frequent and new passengers is a process that requires consideration, especially when it comes to providing the best possible service. Flexibility and innovation are key to ensuring frequent and new passengers get a positive travel experience. As airlines seek to satisfy passengers who fly with them regularly, it is important to provide them with options for booking flights. This includes allowing them to choose the time and location of their seat, as well as the ability to change their reservations if necessary. This helps ensure that frequent flyers feel valued and get the service they have paid for. Airlines must also ensure that new passengers are treated fairly. This means providing them with fair rates and scheduling options, as well as special attention at the time of booking. This helps ensure that new passengers get the best possible travel experience and encourages them to return to the airline. Passenger loyalty programs can also help improve race scheduling. Frequent flyers can earn miles or points for each flight, allowing them to access special fares and benefits. This not only improves frequent flyer loyalty, but also helps airlines motivate new passengers to fly with them. For the career scheduling of frequent and new passengers to be successful, it is important that airlines are prepared to meet the needs of each passenger. This means providing fair fares, flexible scheduling options and loyalty programs to give passengers the best possible travel experience.

2. Registration of new customers (Name, Address, telephone number, Date of birth)(Database)

Clients of the company should be aware that personal data collected by the company will be stored and processed for business purposes. This information will be used to provide better services and promotions to our customers. Personal data collected by the company includes, but is not limited to, name, address, age, contact information, financial information, credit card information, identification numbers, telephone numbers, email addresses, information about the use of our products and services, and customer preferences. The company is committed to maintaining the security of this information and to ensuring that the personal data collected is confidential. Customers have the right to know what personal data is collected and how it is used. If you wish to access, correct, update or delete your personal information, you may do so by sending an email request to our customer service team. To ensure the security and privacy of our customers' personal data, the company will use appropriate physical, electronic and administrative security measures. Misuse or disclosure of this unauthorized information will be considered an act of embezzlement and will be treated in accordance with applicable law. The company reserves the right to modify this policy at anytime. Any changes to this policy will be effective immediately upon posting on the Company's website.

3. Accounting records with daily and monthly report.

Profit accounting records will be a valuable tool for taxi drivers, as they provide a clear overview of the financial health of a business. These accounting records detail all income and expenses, allowing managers and owners to understand cash flow and better understand financial results. Profit accounting records also allow business owners to prepare daily and monthly reports to get a better idea of what their profits are and what their losses are. Profit accounting records begin with an analysis of income and expenses. This helps homeowners better understand their finances and make informed financial decisions. Revenue is the revenue a business receives, such as revenue from sales or services rendered. Expenses are the costs associated with maintaining and operating the business, such as salaries, taxes, rents, and supplies. Once income and expenses have been analyzed, the profit accounting records are completed with a record of all expenses and income, as well as a final balance sheet. Daily and monthly earnings accounting records reports provide detailed information on income and expenses. This information can help

owners better understand their earnings and the factors that affect them. These reports can also help owners identify financial problems, as well as identify cost-saving opportunities. Profit accounting records provide a clear view of the financial health of a business. This is especially useful for business owners who want to stay in control of their finances and make informed financial decisions. Profit accounting records also allow business owners to prepare daily and monthly reports to get a better idea of what their profits are and what their losses are. This allows them to make informed decisions to improve their bottom line.

4. Receivable reminders to debtor customers

We will need reminders for the records of payments receivable to debtor customers as they are an important part of the accounting of a taxi business. These records keep a record of the payments that must be made to customers and the payments they have made. These records also help entrepreneurs determine which customers owe them and which are current on their payments. Records of payments receivable to debtor customers are usually maintained in an accounting database. This allows business owners to view the details of a transaction, such as the amount owed, the customer's name, due date, and any other payment-related information. This information is essential for tracking customer payments and identifying those who owe the company. Records of payments receivable to debtor customers also allow entrepreneurs to calculate the balance of each charge. This helps them make sound decisions about debt collection and determine whether it is necessary to send a collection notice or take legal action to recover the money owed. Records of payments receivable to debtor customers are also useful for business owners to monitor cash flow. This helps them determine the amount of money they have at their disposal to invest in new projects, purchase equipment, and cover overhead. This also allows them to see which customers are at high risk of default and those who are current with their payments. Records of payments receivable to debtor customers are an essential tool for financial management. These records contain important information for debt recovery decision-making and payment tracking. These records are also useful for monitoring cash flow and determining a company's ability to invest in new projects.

- **Secondary Requirements**

Registration of payments by transfers time and date

1. The purpose of this document is to establish a record of payments made by bank transfer between two parties, and to establish the time and date of payment.
2. A payment shall be deemed to have been made when the taxi driver receives the physical money generating the payment to be made.
3. Such notification shall be made by means of a payment order, or by any other accepted means.
4. The payment registration document shall be completed as follows:
 - a) Name of the driver
 - b) Date and time of transfer
 - c) Payment details
 - (d) Amount transferred
 - e) Payment reference
5. The payment registration document must be agreed by both parties and shall be considered valid as proof of payment.
6. Both agree that the payment registration document is the only valid proof of the bank transfer made between them.

5. Daily and monthly ride history

Taxi rides have been an important part of everyday life for a long time. This form of transport has become one of the safest and most comfortable ways to get around the city. Many people rely on taxis to make their daily commutes. Taxis offer their users a variety of options to pay for their trips. Users can choose to pay in cash or by credit card. Depending on the taxi company's policy, users can also choose between fixed fares or variable fares. One of the benefits of using a taxi is the possibility of consulting the history of trips made. Many taxi companies give their users the option to view a log of their daily and monthly trips. This allows users to

see the number of trips made, the total cost of trips, the addresses they have gone to and waiting times. Daily and monthly trip history is a useful tool for taxi users as it allows them to keep track of their spending. Travel history also allows users to gain a better understanding of their travel habits, helping them make informed decisions when choosing between different transportation options. Some taxi companies offer discounts and allowances to their users who make use of travel history to track and manage their spending. This allows users to save money when planning their daily and monthly trips. In conclusion, the daily and monthly trip history is a useful tool for taxi users. It allows users to see the total cost of their trips, manage their expenses, and save money. In addition, it also gives them a better understanding of their travel habits so they can make informed decisions when choosing between different transportation options.

6. Electronic invoicing to the mail. (With backups)

Electronic invoicing is a way to provide and receive electronic invoices. This form of invoicing allows businesses and service providers to send and receive invoices in electronic format, instead of using the traditional paper format. This means that businesses can send and receive electronic invoices directly to an ico email address. The benefits of using electronic invoicing to the mail include significant savings in printing, paper, labor and shipping costs. The time required to process invoices is also reduced. Electronic invoicing reduces the possibility of invoicing errors as documents are sent directly to the recipient's email address. This also reduces the chance of documents being lost or fraudulent. Email billing also reduces the risk of violating customer privacy, as documents are sent directly to the recipient's email address. Electronic invoicing is also more secure, as documents are encrypted and transmitted over a secure network. This means that documents are protected against unauthorized access. Electronic invoicing to mail also allows businesses to reduce storage costs, as documents are stored online rather than in a physical location. This means that documents are available to access anytime, anywhere. This also means that businesses can retrieve documents faster and more easily. In conclusion, electronic invoicing to mail offers businesses a fast, secure and efficient way to send and receive invoices. This allows businesses to save time, reduce printing, paper and shipping costs, and reduce the risk of violating customers' privacy. Electronic invoicing also allows businesses to store documents online and retrieve them faster.

7. Greetings, Reminders, for special dates to the clientes whatsapp.

Special date reminders are a great way to stay connected with customers, making sure they know you appreciate them. Whether you're sending discounts or just want to send a thank-you note, there are some basic steps you can take to make sure your special date reminders are a success. First of all, you need to identify what the special dates are for your customers. This can include birthdays, wedding anniversaries, special business-related dates, etc. Then, you'll need to determine what you want your reminder to look like. Want to send greeting cards, newsletters, discount offers, etc.? Once you have decided on the form of your reminder, then you should prepare the content. Make sure the content is useful and relevant to your customers. After preparing the content, you need to decide how you want the reminder to be sent. Want to send it by email, direct mail, text messages or through your website? This will depend on your target audience, so it's important that you choose a shipping method that's right for your brand. Once you have decided on the format and method of sending, you must schedule the delivery of the reminder. This can be achieved in many different ways; from manual programming to automation with marketing tools. It's always important to make sure special reminders are sent early so customers can respond. Finally, be sure to measure the effectiveness of reminders by special dates. This will allow you to identify which strategies work best for your business. This can include the number of responses generated, the number of people who click on links, the number of people who buy products after receiving the reminder, etc. This information will help you improve reminder strategies for future campaigns. In short, reminders for special dates are a great way to stay connected with customers. If you follow these basic steps, your reminder will be a success and your customers will feel appreciated.

- **Secondary requirements**

Automatic cover letter (name, number, plate)(QR code)

Cordial messages will be generated to make a more intimate relationship between passenger and taxi driver, they will be executed as:

"Dear customer, I am pleased to introduce myself as your new sales consultant. My name is [Name], and I am a professional with [X] years of experience in the [Industry Description] sector. I'm excited to join [Company Name] and can't wait to help you find the best solution for your needs. My main objective is to offer the best possible service to ensure that your needs are met.

I am committed to providing an exceptional level of customer service and creating a relationship of trust so that you can count on me whenever you need a solution. In addition, I am always willing to share with you innovative ideas to improve customer satisfaction. If you need advice on any topic related to the purchase of our products, I will be happy to help you. I look forward to the opportunity to work with you. If you have any questions, please feel free to contact me. Best regards, [Name]"

3.1. External Interfaces

Data entry can cause errors most of the time due to errors when entering or false data that does not match the user's database for communication between client and users

3.2. Functions

The system must carry out the registration of passengers who use the taxi service with their data (name, address, telephone number, email, birthday) and information for next as well as search or eliminate them from the database also has the driver's space in which you register with your data and the license plate number with options to add, remove and print.

Finally, the system implements the account system in which the user can review the payments made with the passenger's data (name, address), the value of the trip and the exact time in which said payment was made.

- By types of user: The taxi driver is the only one who has access to the information with which the system should allow him to drive to his liking and move freely through the interface.
- By objects: The taxi driver can choose between the options of a submenu which will allow him to add his own information, in addition to managing the database at the time of being able to enter new travelers are each attribute and show them on the screen as required.
- By objectives: The system should remember about approaching races, for which it would need a time format with a countdown that establishes the time limit to make the trip.
- By incentives: The system should understand that the payment by transfer has been made.

3.3. Performance Requirements

It is estimated that an indeterminate number of passengers can be entered each with their respective attributes without a specified limit of data the extension continues to grow as much as the taxi driver wishes.

3.4. Design Restrictions

The program does not allow you to register to read the physical money entered. I would need sensors.

3.5. System Attributes

The system is maintainable and portable since the taxi driver can set his personal information that will be shown to his passengers and even re-establish it.

The program will only be used by the taxi driver, not the travelers.

4. Appendices

1. All information regarding program data, whether traveler listings or their respective accounting-related payments, are mostly handled with . JSON, prioritizing the handling of . CSV in accounting records.
2. With the time used and all the functionality that is needed, an amount of \$ 100 is estimated.
3. The Java language will be used.