

Automatic Ticketing in Jetties and Wharfs for Shipping Services

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Abstract – Andaman and Nicobar islands is one of the most important union territory of India, that it has been one of most important tourist spots in India. The main transport system in these islands is the jetties and wharf services. These are the most primarily used mode of transportation in the islands for almost all the everything like shipping of cargos and etc. We had analyzed several issues, and many of which leads to a loss for ticketing services. At present in Andaman and Nicobar the ticket checking system is a manual and a time consuming process which doesn't ensure 100% checking and result in loss to the government at a huge rate. The problems faced by the transport service providers are that many people would be travelling by buying a single ticket, or people will use a smaller distance ticket for a longer distance travel and some people wont be buying a ticket for the travel. In this paper we have come with a solution for the major problem faced by Indian shipping services in coastal areas like Andaman. To overcome this problem we have introduce a concept of modernizing ports to make the passenger not to wait for his ticket to be checked. Our solution comprises techs which includes reusable RFID based tickets which is encoded with details and to track the distance travelled by the bearer for collecting the fare for his/her travel. It also includes loops for several cases which includes children/senior citizens/pregnant ladies etc.

Keywords: Ticket checking system, modern port, RFID tickets

1. INTRODUCTION

In India the main modes of public transportation are the buses, trains, taxies, auto-rickshaws, airplanes and in some places like Goa, Kerala, West Bengal, Assam, Lakshadweep and Andaman and Nicobar islands. But in these modes of transportation the main issue faced by the government is the ticketless travel by the people. Around 2.8crore passengers were accused for travelling without ticket which yielded the government with a revenue of Rs 1,823 crore to the Indian Railways. In Chennai it is seen that the penalties received by MTC is around 6 lakhs per month. The same case happens in all modes of the transportation.

Andaman and Nicobar islands play a vital role in tourism of our country. But shipping is the major transportation service in those areas categorizing of mainland, interisland, ferry services, in and out of the state^[1]. Currently there are more than 84 vessels targeting passengers, passengers cum cargos to a stretch of 30-32 inhabited islands and outer cities including Chennai, Kolkata, Vizag.

Presently the ticketing system is like, we have to stand in a queue apparently two to three days before the commencement of the journey. Apart from humans cargo

holds includes boarding of vehicles like two wheelers, JCB's, trucks and much more. Tickets include variance like deluxe, 1stcabin, 2nd cabin, under ages, physically challenged. Government offers free travelling to disabled people including concessions to students. The main problem faced by the citizens of the Andaman is the time they spend to take a ticket in case they are late to have one. The queries of the government was manual ticket checking often delays the departure of the ship, And to shut the loop holes of people who haven't bought a ticket at all. Also to find that they are deboarding the ship/boat at the correct fared stop.

2. PROPOSED METHOD

The system works in an order with the present booking mode practiced in STARS (ship ticketing advance registration system). When you need to access the ship service all you need to do that is to book a ticket in the form of new developed rfid cards which are recharged with an amount either in a counter or with the machine. The prepaid system allows you to minimize the chance of burning your time all the way down. Tags ranges according to different needs. Concession peoples will be given different colored tags and free travelling tickets are given to children aged under 3, also to senior citizen aged above 60, and also to sick and physically challenged persons , Each ticket has separate use of purpose also the main innovation of our works constitutes at the time of embarkation/disembarkation. Along with passengers vehicles also boarded at the ships, the checking inspector periodically checks the tickets and has to report the proper authority in case of persons carrying duplicate tickets or not having ticket at all.

SYSTEM LAYOUT

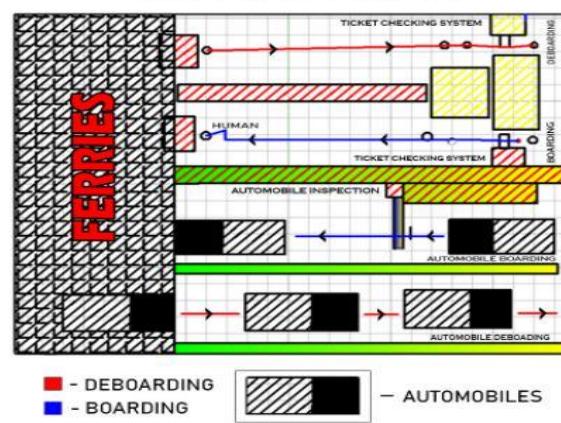


Figure 1 Proposed System Layout

The idea of ours has no place to such activities because there is no need of counter checking inside the ship ,to make the process simple and time saving we introduce automatic ticket checking stations near the jetties and wharfs.

The next big issue to be solved here is the loading of vehicles and luggage , government has listed separate prices for each of them ,but to be sure the correct pricing is made through the official is unseen , the same tags can be made available for these to and can be easily identified the type of vehicle by this system.

1.2 RFID TECHNOLOGY

RFID is a technology similar to bar codes. RFID technology usually converts the radio frequency emitted from a micro-antenna with an integrated circuits with it or vice versa^[1]. The frequency range that is used in the RFID technology varies from lower frequencies of 125kHz to 134 kHz and 140kHz to 148.5 kHz, to higher frequencies of 850MHz to 950 MHz and 2.4GHz to 2.5 GHz. RFID with wavelengths in the 2.4 GHz range are very much limited because they can be absorbed by water.

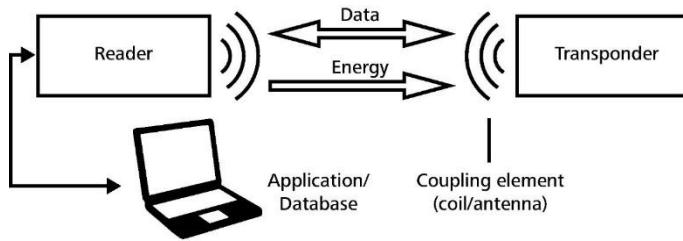


Figure 2 Image Explaining RFID working

RFID technology may be used in a variety of applications including:

- Passports
- Automobile key-and-lock
- Monitoring heart patients
- Pallet tracking for inventory
- Telephone and computer networks
- Smart cards
- Airplane luggage
- Toll booth passes
- Home appliances
- Merchandise tags
- Animal and pet tags

For the working of RFID technology it needs two important elements. One is the transponders(RFID tags) and other one is receivers(RFID readers). In the proposed system the transponders are provided to the users i.e. the passengers, shipments and the vehicles. The receivers are fixed at the ports where the transponders will be scanned at the entry and the exit. Each transponder will be provided with a unique ID that differentiates the individual passengers, shipments and the vehicles.

The two different RFID tags used is discussed in the below tables. In Table 1 the features of the cards that are provided to the passengers are discussed.

Table 1: Features of the Passenger Card

Low Frequency Passive RFID Tags (Passenger card)	
Frequency Range	25 kHz. and 134.3 kHz
Read Distance	30 cm (1 foot) or less - usually 10 cm (4 inches)

In Table 2 the features of the RFID stickers that are provided to the vehicles are discussed. These RFID stickers can be made to stuck with number plate or any part of the vehicle. Since these stickers have an higher frequency, it could be scanned from a greater distance when compared to the passenger cards.

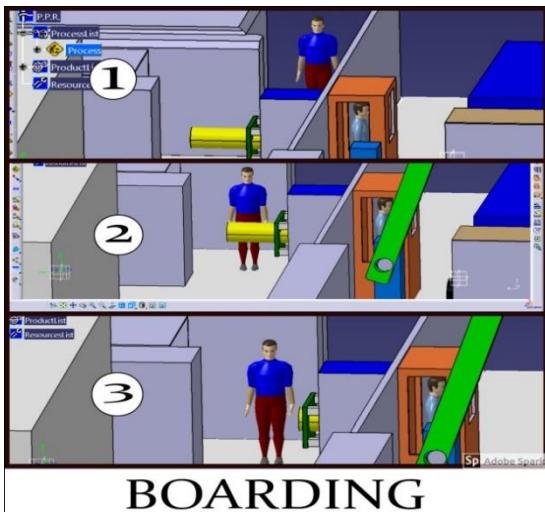
Table 2: Features of the Vehicle Stickers

High Frequency Passive RFID Tags (Vehicles Sticker)	
Frequency Range	13.56 MHz
Read Distance	1.5 meters (4 foot 11 inches) - usually under 1 meter (3 feet)

2. BOARDING STATION

In the boarding station both the passengers and the vehicles can be boarded into the ship . According to our device there are two entry gates for the passengers and the vehicles . Every individual need to scan the RFID card provided for them at the RFID scanner installed with a display at the boarding place (also for deboarding) .The tag has encrypted data including person name , bearers single point of proof, and balance details, he cannot travel or board the ship without minimal balance in the card

In the passenger entry gate every passenger have to verify their identity using the RFID card in the entrance itself . when the passenger enters our devices checks whether the passenger is eligible for concession , if the passenger is eligible for the full concession (patients and sick people) they are allowed to enter free of cost . Then checks for half concession (students and government staff people), if the passenger is eligible for the half or no concession then the devices checks for the type of ship they are going to travel. According to the type of the ship devices checks for the minimum balance to travel and the location is stored database , else it will ask the passenger to recharge.



BOARDING

Figure 3 Boarding Procedure

1. Passenger entering into the passenger card checking section.
2. Passenger ID is verified using RFID reader.
3. Passenger enter into the ship.

A flowchart explaining the deboarding procedure is given with the ANNEXURE, Figure 6.

3. DEBOARDING STATION

In the deboarding station whenever passenger exit our devices checks for the passenger details whether there is a record of passenger entered into the boarding station or not. If the passenger detail is recognized then the checks for the type of ship the passenger have travelled. According to the type of ship and the distance travelled, the amount is detected from the RFID card of each passenger.

1. Passenger enters and is verified in the deboarding section.
2. The amount for the travel is detected from the account.
3. The passenger exit from the deboarding section.

A flowchart explaining the deboarding procedure is given with the ANNEXURE, Figure 7

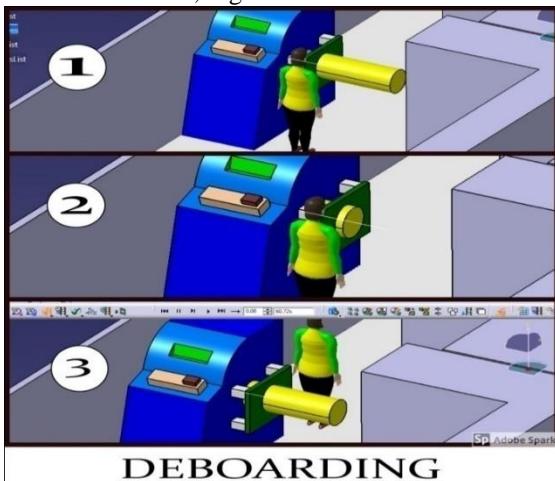
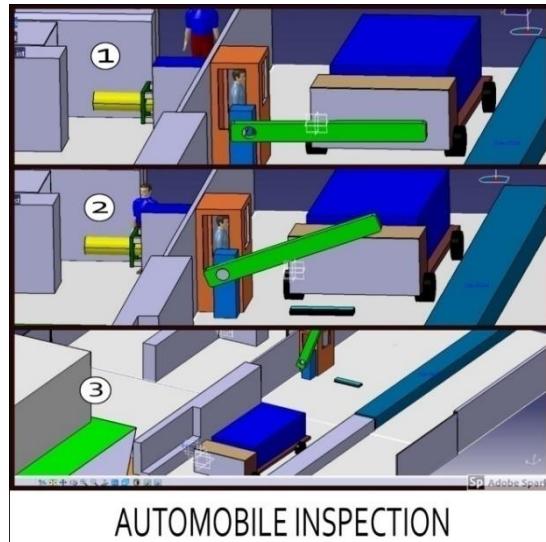


Figure 4 Deboarding Procedure

4. VEHICLE BOARDING AND DEBOARDING

For the vehicles the rfid reader is placed on the floor whenever vehicles enters vehicle have to be identified using rfid stickers stuck in the number plate. whenever a vehicle enters into the station this device checks the amount of load carried by vehicle and considering type of the vehicle the amount is detected in the boarding station .while in the deboarding station the vehicle are allowed go out freely.

1. Vehicles enters into the boarding section .
- 2.Rfid reader verifies the type of vehicle and the amount is detected.
- 3.Vehicle enters into the ship .



AUTOMOBILE INSPECTION

Figure 5 Automobile Inspection

A flowchart explaining the deboarding procedure is given with the ANNEXURE, Figure 8

5. SOFTWARE DESCRIPTION

All the details including the name of the traveler ,their journey, their deboarding station, overall revenue collected by each ship, the amount collected by catering, number of passengers are collected near the scanning system and they are sent to the main computer of the respected wharfs for verification of counterfoils of tickets, and to make trip sheets of them for statistical details and for future use.

Database also made available for the users to track down their own journey and to make sure their efficient time is not being wasted by this method.

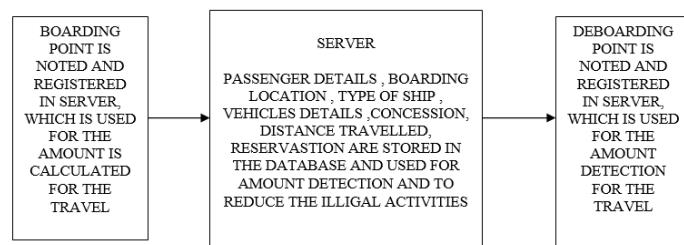


Figure 6 Data flow in the system

In support with the hardware and software there is a technique to calculate the fare of the journey ,and we deduct the fare of each ship on the basis of their secluded fare decided by the government or private parties by the individual and deducting accordingly, also a way to track the present count of travelers in the ship, and can even notify the vehicle owners about ship location , even passengers can know when they arrived at their right stop.

6. ADDED ADVANTAGES

The same system has many number of use apart from the specified one, some of them are listed

- In case of traveling to a higher distance than planned after the commencement of journey can be encouraged since the actual fare is collected at the deboarding end.
- Linked with the passes given by the government in order to replace them at a minimal rate.
- Used to access the catering services offered inside the ship without hard cash but through digital cash in our card.
- Also used to put a leap towards the new schemes allotted by the Indian government to transform the island of Andaman and Nicobar as a well-known tourists spots.

7. DATA MANAGEMENT

The trip sheets collected by the system are saved over a long period of time and immediately sent to the right officials may be to DDSS (Dy.Director Shipping Services) or to DSS (Director Shipping Services). The travelling and shipping announcements can be made available over an application for both civilians and government officials, for transparent clarification of services offered by their government. In need of an external copy there is an option to export the details as an excel form which can be publicly viewed by everyone.

8. FUTURE WORKS

The contents furnished above are highly made into possible works; also we are working on some extensions and improvement based on the above system.

- 1) First of all we planned to reduce the labor work of the tally clerks completely .
- 2) Next we have planned to modify the system to cope with the future generations because the present system tends to

work with low access of internet ,since internet plays a tiny role in these islands at present.

- 3) Then we want to offer the tags as a free of cost to civilians and to decrease the ticket cancellation charges to 20%.
- 4) Finally we need an on board biometric scanner for the verification of sudden inspections, to avoid conflicts.

9. CONCLUSION

In this paper we solved problems faced by the civilians and government in shipping services offered to them. And we are still working to fulfill each and every nominal problems in the services, During our studies we came across some problems in our system like who should be notified that anyone deboarding at a station with a lack of cash in their tags , and like what is the way to communicate with the traveler because in those areas most of them don't have cell phones, etc.

We are working at a progressive rate to find a valid solution to all the problems in our system and make it as a spill spoof to the modern society.

10. REFERENCES

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ANNEXURE

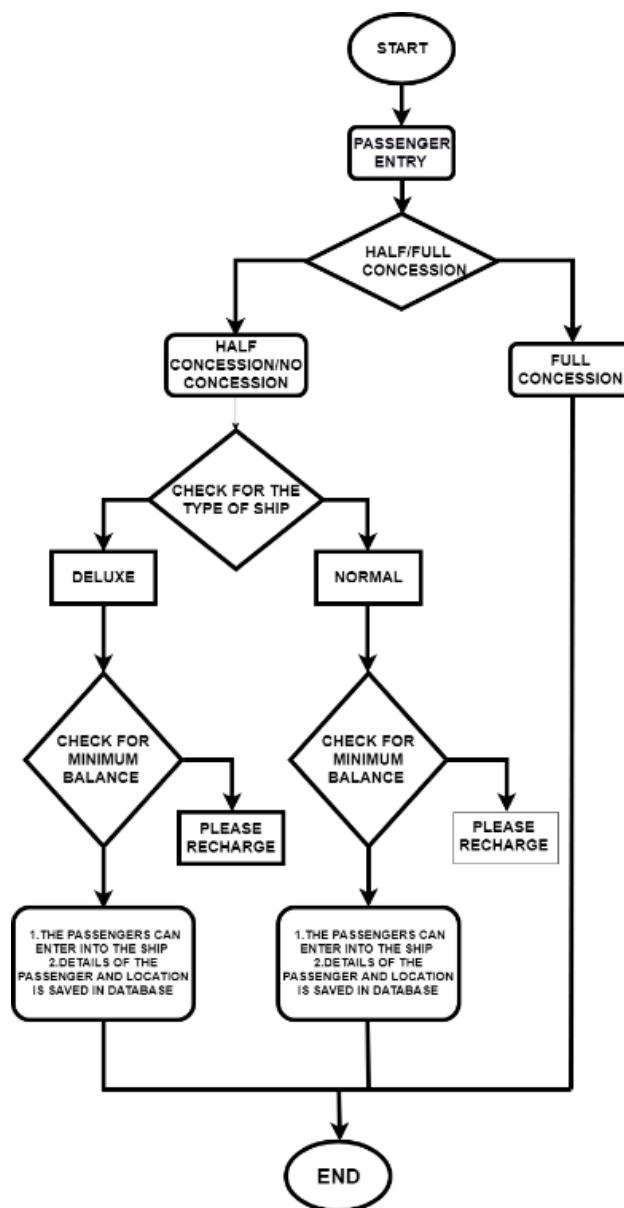


Figure 7 Flowchart Explaining the boarding procedure

ANNEXURE

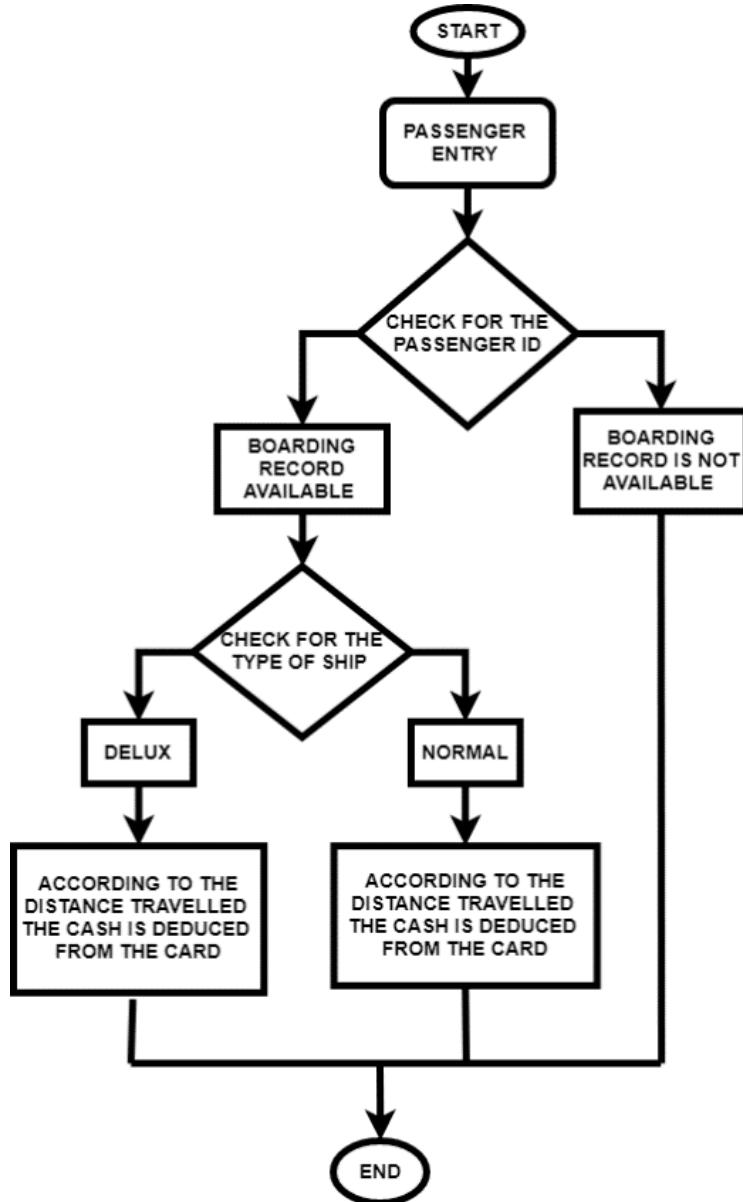


Figure 8 Flowchart Explaining De-Boarding Procedure

ANNEXURE

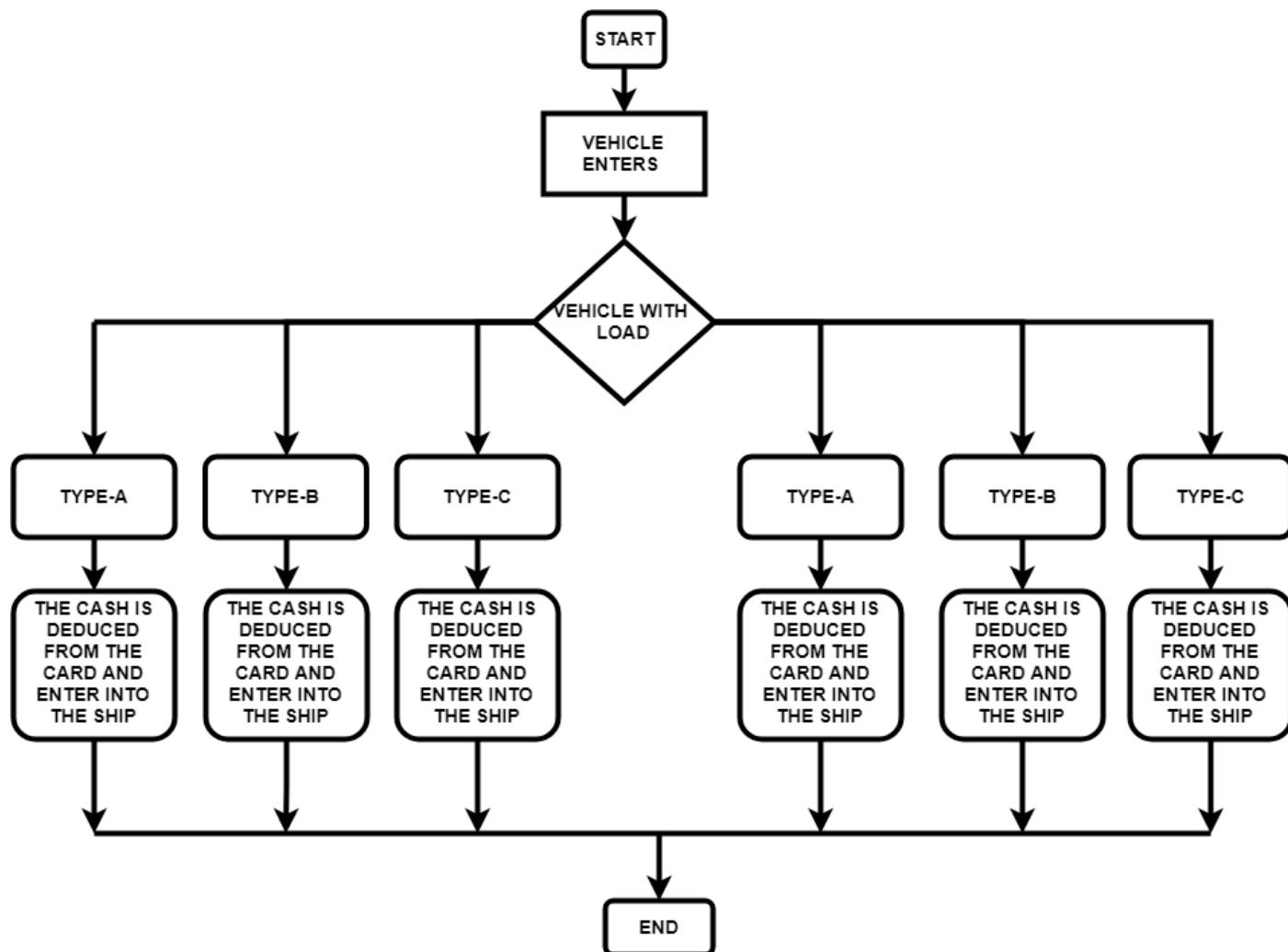


Figure 9 Vehicle Charge Detection