Traditional Taxi Services (Non-app-based) or Ride-hailing (App-based): Travelers Perspectives in Goa

A Dissertation for

Course code and Course Title: COM-651 Dissertation

Credits: 16

Submitted in partial fulfillment of Master's Degree

Master of Commerce

By

DIVYA PANDURANG PARSEKAR

Seat Number 12 -2022

ABC ID 624815404272

PRN 201820226

Under the Supervision of

AAKRUTHI AMRUT ALARNKAR

Goa Business School

Commerce

GOA UNIVERSITY

Date: April 2024

2

DECLARATION BY STUDENT

I hereby declare that the data presented in this Dissertation report entitled, "Traditional Taxi Services (Non-app-based) or Ride-hailing (app-based): Travelers Perspectives in Goa" is based on the results of investigations carried out by me in the Master of Commerce Discipline at the Goa Business School, Goa University under the supervision of Asst. Prof. Aakruti Amrut Alankar and the samė has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will not be responsible for the correctness of observations / experimental or other findings given the dissertation. I hereby authorize the University authorities to upload this dissertation to the dissertation repository or anywhere else as the UGC regulations demand and make it available to anyone as needed.

Name: DIVYA PANDURANG PARSEKAR

Seat No: 12-2022

Date:

Place: Goa University

3

COMPLETION CERTIFICATE

This is to certify that the dissertation report "**Traditional Taxi Services (Non-app-based) or Ride-hailing (app-based): Travelers Perspectives in Goa**" is a bonafide work carried out by Ms. DIVYA PANDURANG PARSEKAR under my supervision in partial fulfillment of the requirements for the award of the degree of Master of Commerce in the Commerce Discipline at the Business School, Goa University.

Asst Prof. Aakruthi Amrut Alankar

Date 30/04/2024

Signature of Dean of school

Date: 30/04/2024

Place: Goa University

Goa Business School ★ Goa University ★

School Stamp

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to all those who mentored and supported me in the completion of this project.

First and foremost, I would like to thank my guide, Assistant Professor Mrs. Aakruthi Alarnkar, for her constant support, valuable guidance, and encouragement throughout the work.

I would like to thank all the 409 respondents to fill out my questionnaire

I would also like to thank all our teachers for the support needed to complete this project.

I am also grateful to my friends who contributed ideas and perspectives that enriched the project.

Thank you everyone

Divya Pandurang Parsekar

TABLE OF CONTENT

List of Tables

List of Figures

ABBREVIATION

Sr No.	Entities	Abbreviation
1	Attitude	A
2	Behavior Intention	BI
3	Convenience	C
4	Government Support	GS
5	Perceived Behaviour Control	PBC
6	Price Convenience	PC
7	Subjective Norms	SN
8	Travelers Perspective	TP

PREFACE

Although both traditional taxis and ride-sharing offer on-demand door-to-door transportation services, the competition between the two services has long been controversial, and most academics have focused on this issue or how the increased demand for ride-hailing services affects established services. However, the traveler's perspective is often overlooked. To bridge the gap between these two services, the study will examine the traveler's perspective on both online and offline services. Using the Theory of Planned Behavior, and will create a structural equation model to explain the traveler's behavior intention and determine the behavior variables (attitude, subjective norms, perceived behavioral control, price convenience, emotions, etc.) while selecting online and offline taxi service modes. The sample size is 400, and it will examine both Goa residents and tourists visiting Goa. The research findings would be valuable in developing applicable policies and techniques for the operation and growth of both services, as well as framing policies for both tourists visiting Goa and Goan residents.

CHAPTER 1: INTRODUCTION

1.1 Introduction to road transport:

Road travel is a low-cost and popular means of transportation for both businesses and people, contributing considerably to India's economic development and social integration efforts. In 2005–06, road transport accounted for 87% of passenger traffic and 60% of freight traffic flow, accounting for 4.5% of total GDP. The vehicle's simplicity of use, customization to individual demands, and cost savings make it a popular means of transportation. The Ministry's Road Transport Wing develops policies for road transport regulation and makes arrangements for vehicular traffic movement with adjacent nations. Improving road safety is a difficult responsibility of the Wing, which oversees projects such as awareness campaigns, the National Highways Accident Relief Service Scheme (NHARSS), refresher training for heavy truck drivers, and supplying road safety equipment. (Roads Transports | Ministry of Road Transport & Highways, Government of India, n.d.)

The transportation sector is enormous and diversified, serving the demands of 1.1 billion people. In 2007, the industry generated around 5.5 percent of the nation's GDP, with road transportation accounting for the majority of that proportion. A good physical connection between urban and rural areas is critical for economic progress. Since the early 1990s, India's expanding economy has seen an increase in demand for transportation infrastructure and services. Roads are the most common means of transportation in India nowadays. They handle over 90% of the country's passenger traffic and 65% of its freight. The density of India's highway network, at 0.66 km of roadway per square kilometer of land, is comparable to that of the United States (0.65) but far higher than that of China (0.16) or Brazil (0.2). (Transport - India Transport Sector, n.d.) According to India's National Highways Authority, highways carry around 66% of freight and 82% of passenger traffic. National highways account for around 40% of overall road traffic, even though they cover just roughly 2% of the

road network. Over the last few years, the average annual increase in the number of automobiles has been roughly 10.16%. In 2000, around 40% of villages in India lacked access to all-weather roads, leaving them isolated during the monsoon season. To increase rural connectivity, Pradhan Mantri Gram Sadak Yojana (Prime Minister's Rural Road Programme), a project supported by the Central Government with the aid of the World Bank, was launched in 2000 to develop all-weather roads to connect all habitations with a population of 500. (Transport in India, 2024)

1.2 Evaluation of the Transportation Industry

The Bullock Cart:

The bullock cart, which is 5,000 years old, has developed over time as cow breeds improved and bigger loads were used. The disc wheel is no longer common, and the thin tires put too much pressure on the road. The axle bearings are loose, resulting in excessive tracking and quick wear into ruts. Earth roads have become drainages in mon ponds, inaccessible to all vehicles save the cart. The expense of maintenance has risen, and motor vehicles have accelerated wear. The single test track in India, located in Calcutta, is meant to simulate high motor traffic, not heavy motor traffic. By 1926-27, 80% of all roads and 57% of metalled roads were under control. (“ROADS AND ROAD TRANSPORT IN INDIA,” 1947)

Human-pulled rickshaws:

Human-pulled rickshaws are becoming more scarce in the country's towns and countryside. Many municipal governments have sought a ban on these rickshaws, calling them "inhuman." In 2005, the West Bengal government planned to prohibit these rickshaws. Though the West Bengal Assembly enacted a measure to remedy this issue, known as the Calcutta Hackney Carriage Measure, in 2006, it has yet to be implemented. The West Bengal government is working on an amendment to this bill to close the gaps discovered after the Hand-pulled Rickshaw Owners' Association filed a petition against it. (Transport in India, 2024)

Cycle rickshaw:

Cycle rickshaws debuted in India in the 1940s. They are larger than a tricycle, with two people sitting on a raised seat in the rear and one person pedaling from the front. They were prohibited in various places in the late 2000s because of their contribution to traffic congestion. The Delhi Police recently presented an affidavit against the use of bike rickshaws to alleviate traffic congestion in the city, but it was rejected by the Delhi High Court. Furthermore, environmentalists have advocated the preservation of bike rickshaws as a non-polluting means of transportation. (Transport in India, 2024)

Commercial Motors:

Motor transport in India began following the 1914-18 war, largely for surplus passenger cars. The old cars wore out, making main-road runs more profitable. Competition began, prompting the establishment of the Central Road Fund in 1930. The fund was founded from an increase in Customs and Excise duties on gasoline, and it included a central office for scheme coordination, research, and intelligence. The Central Government set aside 10% of the cash for discretionary grants, research, and intelligence, with the remainder distributed to provinces and states depending on their fuel consumption. The Road Fund was viewed as a respite from the need to upgrade existing paved roads as a result of increased traffic and competition among motor buses. (“ROADS AND ROAD TRANSPORT IN INDIA,” 1947)

1.3 Taxi industry in India

Taxicabs are referred to as taxis in India; the word "cab" is rarely used. Depending on the city/state, taxis can either be hailed or hired from taxi stands; in cities like Bangalore, taxis must be hired from taxi stands; in cities like Kolkata and Mumbai, taxis can be hailed on the street. Additional surcharges for luggage, late-night rides, and toll taxes are to be paid by the driver. Taxis and all other commercial vehicles have a yellow number plate, making it easier for officials to charge taxes and tolls on highways. Delhi is the only city in India with

taxicabs operating solely on Compressed Natural Gas. (Transport in India, 2024) In India, taxis are a major form of transportation as the country lacks a reliable public transit system. 2.3 million registered taxis are operating in various Indian states, according to the Road Transport Yearbook. All kinds of taxis are included in this number. In the organized sector, there are between 500,000 and 600,000 taxis providing taxi services. The market is thought to be worth around $9 billion in total, of which only 6–7% is structured. The market for taxis has seen an Over the last six to seven years, there has been a remarkable expansion in the taxi industry in India. significant growth during the past three to four years, expanding at a rate of 15-20% annually at the moment. Compared to the overall Indian taxi industry, the organized taxi sector is still tiny, accounting for about 4–5% of all cars on the road. (“A Study of Taxi Aggregators in India: Opportunities and Challenges,” n.d.) white. Since taxis and all other business cars have yellow license plates, it is simpler for officials to collect taxes and tolls on roads. Taxis can be rented via taxi stands, reserved through apps, or hailed depending on the city or state. Taxis may be hailed on the street in Kolkata and Mumbai, but in towns like Bangalore, they must be reserved in advance through taxi stands or online. The passenger is responsible for paying any additional costs for luggage, late-night rides, and toll taxes. Due to economic inequality, despite the rising economy, a variety of taxi services have emerged. For instance, there are five in Delhi. The least expensive options include auto rickshaws; regular taxis; radio taxis; white taxis; and tourist taxis. Because auto rickshaws are prohibited in places like Noida and Gurgaon, cabs have a monopoly. There is also a well-established network of contemporary radio taxis in Chandigarh. According to a government mandate, a fee meter must be fitted in every cab. Auto rickshaws are a fierce rival to taxis, but in certain places, like Mumbai, they are prohibited from operating in the central business area, giving taxis the upper hand. The type of automobiles utilized as taxis in India, as well as the state of the economy and transportation, are all directly impacted by this monopoly. (Transport in India, 2024)

1.4 Types of Taxis in India

Black and yellow taxis: In India, the black-and-yellow cab is one of the most recognizable images associated with urban transportation. These cabs are easily identified by their unique color scheme and are mostly seen in places such as Mumbai and Kolkata. They are usually metered and provide an affordable way to go short to medium distances in the city. Frequently, these taxi drivers are seasoned pros with extensive familiarity with the area roads. Gandhi, a former independence fighter, advised former prime minister Jawaharlal Nehru to paint the top portion of the taxis yellow so that they would be seen from a distance.

Radio taxis: Compared to typical taxis, radio taxis are more organized and pleasant. These services, which are frequently run by private businesses, offer clean, air-conditioned cars. Clients may reserve these cabs via phone calls or smartphone applications, guaranteeing a more streamlined and dependable service. In comparison to standard taxis, radio taxis are more comfortable and professional, which makes them popular in urban areas.

App-based ridesharing service: Companies like Ola and Uber have developed a platform where passengers can hire cabs using their cell phones thanks to contemporary technology. In addition to booking a cab and viewing the driver's current position in real time, consumers may only make payments using an online form.

Outstation taxis: These are the long-distance taxis that customers can book for interstate or long-distance travel. Both individuals and organizations can hire them, and the fee is often determined by the distance covered.

Luxury taxi: More upscale experiences are what travelers want. The taxis, which are often luxurious SUVs with extra features like air conditioning and wifi, are perfect for business travelers. For those seeking a high-end experience

Electric taxis: In their efforts to encourage the transportation sector to adopt sustainable energy, local governments usually include electric taxis in their campaigns. In line with the

global movement toward sustainable transportation, electric taxis are beginning to arrive in several Indian cities. These greener vehicles promote more ecologically conscious urban mobility while also assisting in the reduction of carbon emissions. An electric taxi has a motor that is powered either fully or partially by an electrical storage battery.

Bike taxi: ideal and well-liked for short-distance travelers Bicycle taxis are more economical and are utilized by lone travelers since they run on two wheels. In India, there are other useful applications for renting a bike taxi. It helps to lessen traffic and is healthier for the environment.

Pink taxis: Some Indian communities have installed pink taxis as a safety precaution; they are especially well-liked by female passengers. These taxis include safety features to ensure that female passengers are comfortable and safe while riding, and they are driven by female drivers. In response to concerns about women's safety during travel, pink cabs offer an alternative that promotes security and inclusivity.

Government-run taxi: The local government or authorities in charge of the area control taxis, ensuring that the price structure, driver qualifications, safety procedures, and taxi service advertising are all met. (Taxi, 2023)

1.5 Current taxi scenario

Businesses such as Ola and Uber have effectively leveraged the internet. When compared to the industry heavyweights, Ola and Uber, the smaller taxi businesses operated quite differently due to their usage of the internet. The consumers found the concept of using an app to hire a taxi to be very appealing. Customers found additional appeal in the driver's GPS location and comprehensive information A., & A. (2023, July 28). The majority of Indian cities lack comfortable public transportation, which has increased the demand for taxi services. Since 2006, the business has received investments totaling more than $150 million in some acquisitions, and the enthusiasm of investors does not appear to be waning. There

has been a sudden surge in the number of participants. The intense rivalry has prompted players to investigate new pricing models, taxi segments, etc., ultimately (Taxi-market-in-India-Driving-into-the-future-, n.d.)

1.6 A major problem in the taxi industry in India:

Even if there are major competitors in the industry and online taxis are becoming more and more popular, in certain places there is a mismatch between supply and demand. It's the region of the nation where the offline (traditional) taxi industry is losing ground to the online one, forcing the latter to drastically cut the fares they charge. This puts a strain on them occasionally because they occasionally rent cars, and things get tough for them if the rent isn't paid on time. Apps frequently stop functioning in metropolitan suburbs. Technical problems that arise while making reservations over the phone or online have a detrimental effect on the client experience. Furthermore, cab owners must abide by stringent laws and regulations in various areas and when it comes to car upkeep, fitness, and other matters, certain Indian states have less detailed laws and regulations.

1.7 A major problem in the taxi industry in Goa:

The primary issue with Goa's taxi services is that there aren't enough taxis available in different areas of the state. In addition, well-known applications like Ola and Uber are not accessible in Goa, and cab proprietors must abide by strict regulations set forth by the government of Goa to renew the permission that has been granted to them. Goan residents, on the other hand, are less familiar with online cab services and would much rather use public transit. Tourists visiting Goa are more likely than natives to use the cab service.

1.8 Overall taxi operation in Goa:

- “While there are 14,575 all-India permit taxis, there are 2,593 all-Goa permit taxis and 674 yellow and black taxis. In addition to this, there are 2,450 app-based taxis in Goa.” (Sayed, 2021)
- The fair rate is different for different types of cars, like the Premium Cab, which is (Mercedes, BMW, AUDI, Fortuner, Ford Endeavour, Skoda Kodiaq, Jaguar, Land Rover, etc.). For 8 hours (full day) up to 100 km, it is Rs. 8400, and for normal 4 sitters like Swift, Baleno, i20, Liva, Datsun Ready-Go, VW-Polo, Jazz, etc. For 8 hours (full day) up to 100 km, Rs. 1950
- Extra charges per hour excluding the agreed hours are Rs. 100/-.
- Taxis utilized for night journeys after 10 p.m. until 5 a.m. will attract night charges of Rs. 100 per hour. (Department of Transport, Government of Goa, n.d.)
- All tourist taxi vehicles must be registered with the Directorate of Transport Goa and have the certificates and documentation listed below,- certificates/documents valid as of the date of registration. Valid RC Copy. Valid Road Tax/Fitness certificate. Valid Insurance Certificate. (Department of Transport, Government of Goa, n.d.)
- The matter regarding permits is handled by the RTO office.

1.9 Ride-hailing introduction

Ride-hailing, also referred to as ride-sourcing, ride-sharing, vehicle-for-hire, or on-demand ride services, is a smartphone-based platform that links users (travelers) and service providers (ride-hailing applications). It enables users to hire taxis from any location, follow the exhausted driver in real-time, and pay only for the actual distance driven. Over the past years, ride-hailing services have experienced exponential growth in popularity, reaching most metropolitan areas across different nations. The user-friendly platform of the service, which offers comprehensive door-to-door service, easy payment processing, additional convenience,

and short wait times, has completely revolutionized the taxicab sector overnight. (Contreras & Paz, 2018) Online car-hailing is not permitted to cruise or provide street hailing; it is only permitted to transport customers through network appointments. As a result, the conventional cab has been replaced by online car-hailing services, while there are certain similarities and distinct marketplaces between them. (Lyu et al., 2021) Since the taxi industry considers resourcing to be an unlawful business that violates regulations and unfairly competes, resourcing has drawn a lot of criticism from this industry. Despite rules and monopolistic practices that limit supply and cause issues with dependability and service quality, taxis have not been able to formally replace ride-sourcing services in many cities. Others contend that ride-sourcing is not like traditional taxis because of the pricing mechanisms, rating system accountability, and matching platform's dependability and efficiency. Advocates argue that, in contrast to taxis, ride-sourcing allows drivers to utilize their existing cars more effectively. In light of the transportation sector's recent fast expansion and change, resourcing has emerged as a component of the new economy. Ridesourcing services connect drivers of personal vehicles with clients who require trips now or at a later time using smartphone applications. The ability of ride-sourcing software to track and show drivers' and passengers' real-time positions, enabling them to predict waiting times, is a crucial feature. Transportation network companies (TNCs) provide a method of transportation that is just as flexible as a typical taxi by combining various technology innovations. (Rayle et al., 2016) Evaluation of ride-sourcing is necessary because of its effect on travel behavior as well as how it is altering urban transportation and economic efficiency in comparison to the current situation. Determining how ride-sourcing is affecting current travel options is a major problem. (Barbour et al., 2020)

Table 1.1
Use of online taxi services, ridesharing, and hailing by brand in India as of December 2023

Name of app	Online taxi usage
uber	76%
ola	73%
Easy cabs	19%
Quick ride	15%
Aamchi drive	13%
Other	5%

Source: (Ride Sharing/Hailing / Online Taxi Usage by Brand in India 2023, 2024)

1.10 Introduction to Traditional Taxi

The basic definition of a traditional taxi is a service that provides passengers with the option to be picked up and dropped off at a desired location, subject to certain considerations that the local government primarily determines. The drivers of traditional taxis are private individuals who do not have access to any other online platform; instead, they wait for passengers to arrive on the streets, in popular areas, or at any specific location. The services offered by traditional taxis and ride-hailing taxis are nearly identical, except for a few factors. Moreover, ride-hailing taxis are linked to a specific platform to receive passengers in exchange for a commission from the companies. There are specified locations where taxis can wait for customers and vice versa. Taxis are private cars employed for public transportation services, offering door-to-door personal transportation. In the pre-booked market, customers call a dispatch center and request a later or immediate taxi service. The taxi industry is more convenient because of its extensive operating hours, absence of parking costs, privacy, comfort, and door-to-door capability. (Salanova et al., 2011) India's taxi market is projected to be worth USD 20.61 billion in 2024 and USD 38.90 billion by 2029, with a compound annual growth rate (CAGR) of 13.55% from 2024 to 2029. (India Taxi Market Insights, n.d.) Ride-hailing services, in contrast to traditional taxi services, are

delivered through smartphone platforms and link clients directly to private drivers operating private automobiles. Traditional taxi services were created based on street-hailing trips. There is enough data to demonstrate that as ride-hailing services have become more popular, the taxi business has suffered major losses in terms of market shares, transactions, and income. (WANG et al., 2022)

1.11 About Goa

Located on the western coast of India, Goa is one of the country's most popular tourist destinations, bringing in millions of visitors each year from all over the globe. Goa's economy is mostly reliant on tourism, which increases employment and the state's gross domestic product. Goa is a well-known travel destination. Given that cabs are an essential mode of transportation for both tourists and locals, Goa's transportation system is one of the most important aspects of the destination's infrastructure for tourists. Taxis provide visitors with flexible and convenient means of transportation as they explore the many attractions. For many Goans, the taxi industry is a vital source of income, including drivers, owners, and operators. An essential part of Goa's tourist ecology, taxi services deliver(Department of Transport, Government of Goa, n.d.)

1.12 Who can get a tourist taxi permit in Goa:

- All tourist taxi vehicles must be registered with the Directorate of Transport, Goa.
- Documents: a valid registration certificate copy, a valid road tax or fitness certificate, a valid insurance certificate, a valid pollution certificate, and a valid tourist taxi permit.
- The owner of the vehicle must be identified as the driver of the permitted vehicle.
- The driver registered must have a valid driving license concerning driving the tourist taxi, which is authorized by competent authorities.

- Taxi/driver registration forms are available at the registration facilitation centers in North Goa and South Goa. (Department of Transport, Government of Goa, n.d.)

1.13 Types of taxis in Goa:

There are several taxis available in Goa, e.g., tourist taxis, paid taxis, contract carriers, government taxis, private taxis, online taxi-hailing services, motorcycle taxis, and inter-city taxis, and the most popular are explained below.

Tourist taxi: Taxis intended specifically for visitors are known as tourist taxis, and they may be found at many state places, including well-known hotels, beaches, airports, and train stations. They work with tourist taxi licenses, which must be renewed after a predetermined amount of time. The distinctive hue, the yellow-black license plate, and the red stickers that read "tourist taxi" make it easy to identify tourist taxis. They are owned and operated by private persons; their only obligation to the government is to pay taxes. The cab drivers are required to possess a valid driver's license.

Online taxis in Goa: Online taxis are those that are rented using applications; in Goa, the government runs two such apps: the "Goa taxi app" and "Goa Miles," which are run by both the government and commercial entities. In Goa, there is no Uber.

Table 1.2

1.14 Comparison between online and offline taxi service

Attributes	Traditional taxi mode	Ride-hailing service mode
How it world	Taxi drivers wait for passengers on the road at designated spots, or the passengers make reservations through a phone call.	It facilitates passenger-held bookings by utilizing information and communication technologies, including mobile applications.
Method of Hiring	Phone call, street, or taxi stand	Smartphone App
Market conditions	Peak hours see a high volume of traffic, and in traditional taxis to optimize income, drivers usually focus their operations on high-demand areas. and continued to run at off-peak hours.	Most ride-hailing drivers are concentrated during daily peak traffic hours. A smaller percentage is in the off-peak hours.
Driver rating	Not available	Available
Estimated time of arrival	Not available	Available
Law and regulation	Well, defined	Gray area
Operation mode	individual operation, in which the taxi's owner also has the title to the car and the authority to drive it.	offer a platform for matching supply and demand data; private or rental automobile firms' cars or drivers are not provided. The vehicle's owners are the drivers.
Pricing mechanism	The government regulates and controls ride-hailing prices, so the benefit distribution system is ideal and the pricing standard is transparent and unambiguous.	While ride-hailing offers a more flexible price structure than other services in the market, this also leads to opaque and unclear markup and pricing guidelines.
Discount system	I can get a discount with good bargaining skills.	It is mostly not possible to get a discount as the rates are prefixed by the app based on the distance.

Source: (Hu et al., 2022), (Akimova et al., 2020)

1.15 Research objective

O1: To analyze the travel selection behavior of travelers concerning traditional taxi and ride-hailing taxi service

O2: To investigate the factors affecting the Traveler's perception and travel behavior intention concerning traditional taxi and ride-hailing taxi service

1.16 Research hypotheses

H1: Price convenience has a positive influence on the traveler's perspective

H2: Convenience has a positive influence on the traveler's perspective

H3: Government support has a positive influence on the traveler's perspective

H4: Subjective norms have a positive influence on the traveler's perspective

H5: Attitude has a positive influence on the traveler's perspective

H6: Perceived behavior control has a positive influence on the traveler's perspective

H7: Travelers' impressions have a favorable impact on behavior intention.

1.17 Research Question

RQ1: is there any relationship between traveler's perception and travel behavior?

RQ2: is it possible to find out what factors influence the travel behavior intention of travelers

1.18 Scope of Research

- Help local authorities to provide relevant measures for the operation and development of online and offline taxi services
- The findings will help the government provide enhanced amenities for drivers of taxis so that they can enhance their service delivery methods.
- Taxi drivers improve the entire conditions of the taxi or cab and the services they are delivering to their passengers to better their traveling experience.

1.19 Chapterisation scheme

Introduction: This chapter includes background of the taxi industry, the history/ evaluation of taxis, a comparison of online and offline taxis, rules and regulations of taxi types of taxi available

Literature Review: This chapter has two sections. The first section evaluates the existing literature with the help of a graph and classifies the literature by year of publication, number of authors, types of journals, and different key areas studied along with the countries. The second section includes the research questions, objectives, scope, and explanation of the theory of planned behavior and research hypotheses.

Research Methodology: This chapter includes the study design, how the study is carried out**,** scale development, the data collection process, an explanation of the measurement model and structural model for both online and offline services, and the testing of hypotheses.

Findings, conclusion: this chapter explains the findings (result) of offline taxis and findings (result) of online taxis and the conclusion.

CHAPTER 2: LITERATURE REVIEW

2.1 Summary of literature review

The research assesses the literature from various publications and platforms. A graphical representation of the assessed literature is provided. The keywords used to find relevant research papers are traditional taxi, ride-hailing, theory of planned behavior, tourist, and traveler perspective. The year of publication, the number of authors, the nation of categorization, the kind and nature of the study, the type of data gathered, the main or secondary research method, the sampling method, the sample size, and the methodology are used to divide the selected research papers.

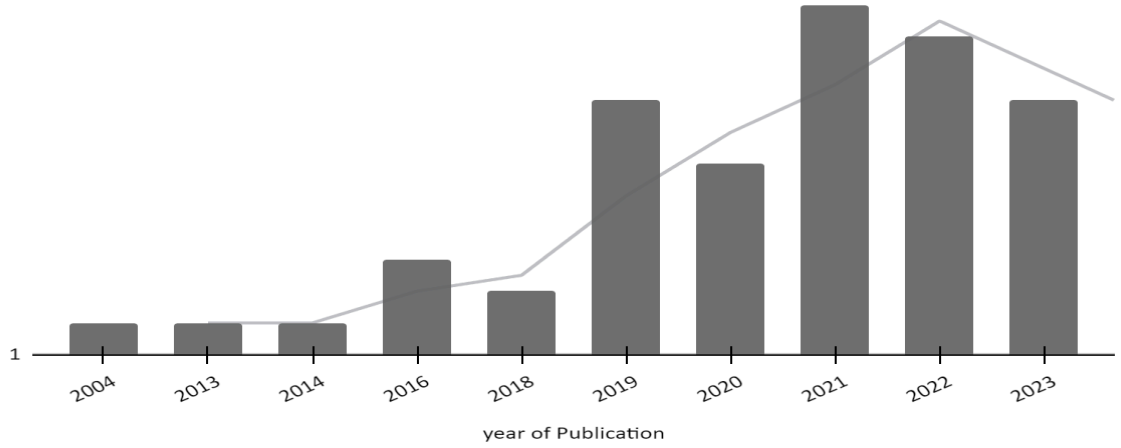
Research gap analysis: For the analysis of the research gap, a graphic representation, as well as a summary of the literature, are given: year of publication, name of the journals, classification according to countries, classification according to key areas, number of authors, nature of the study, i.e., qualitative and quantitative, sampling method used, sample size, sampling method, and statistical technique used for the analysis.

2.2 Summary of Literature

Along with research articles, associated websites, and other connected material, over sixty research papers were downloaded. The ScienceDirect, Elsevier, Scopus, Google Scholar, JSTOR, ResearchGate, and other platforms provided the research articles for the literature study. The following list of relevant study fields is the analysis of several charts created using the same data that was uploaded into an Excel sheet.

2.2.1 Classification according to year of publication

Fig 2.1

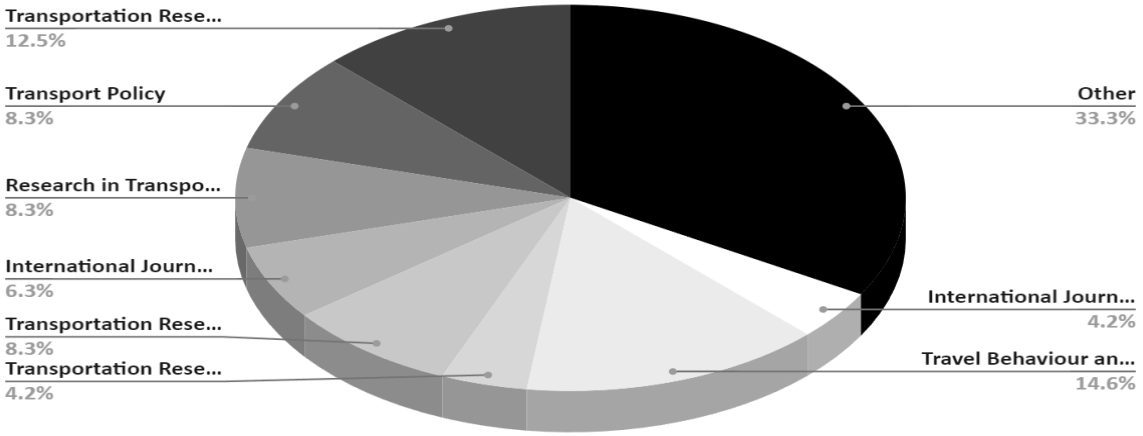


Source: the result of a literature review using Microsoft Excel

The most scholarly articles that were published in 2021 on taxis, according to the data collected. The research articles for this subject were gathered up to 2023. Based on the year of publication, it is evident that the research trend in the taxi sector began no more than ten years ago, and the trend line has been rising in tandem with the industry's expansion. Technology is also helping to expand the study topics that are available in this sector.

2.2.2 Classification according to journals

Fig 2.2

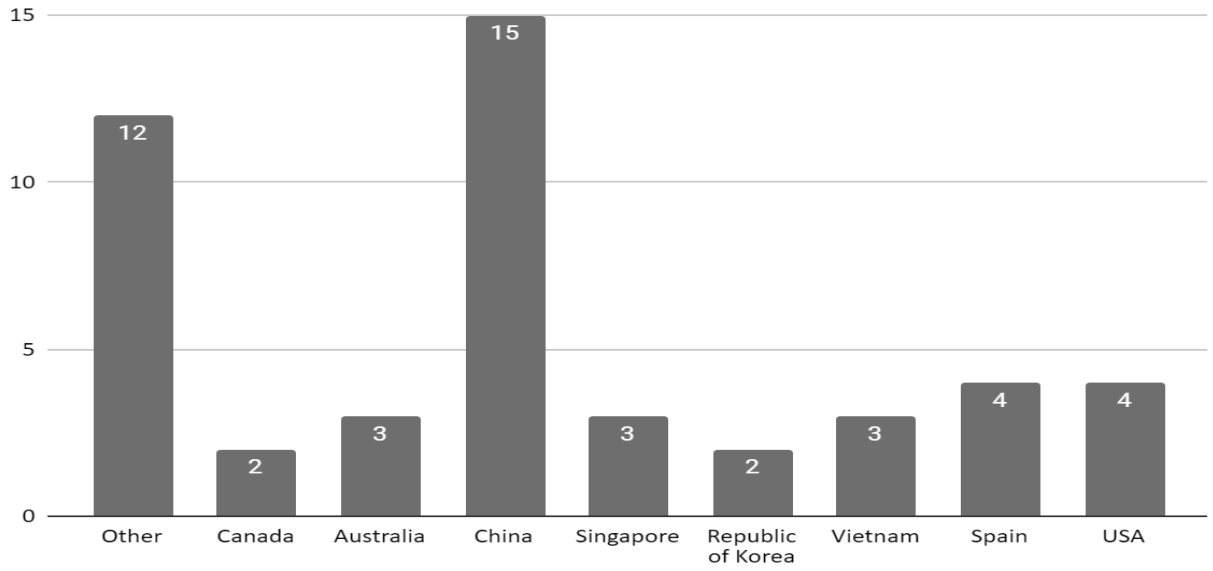


Source: the result of a literature review using Microsoft Excel

The pie chart that shows the most popular journals for publishing research papers shows that transport policy was the most popular publication for sectors relating to taxis, followed by transportation research. To analyze this pie chart, more than 45 research papers were retrieved from various platforms such as ScienceDirect, Elsevier, Scopus, Google Scholar, JSTOR, and ResearchGate. Transport Policy Journal has the largest percentage of downloaded research articles (33.3%) in the provided pie chart.

2.2.3 Classification according to countries

Fig 2.3

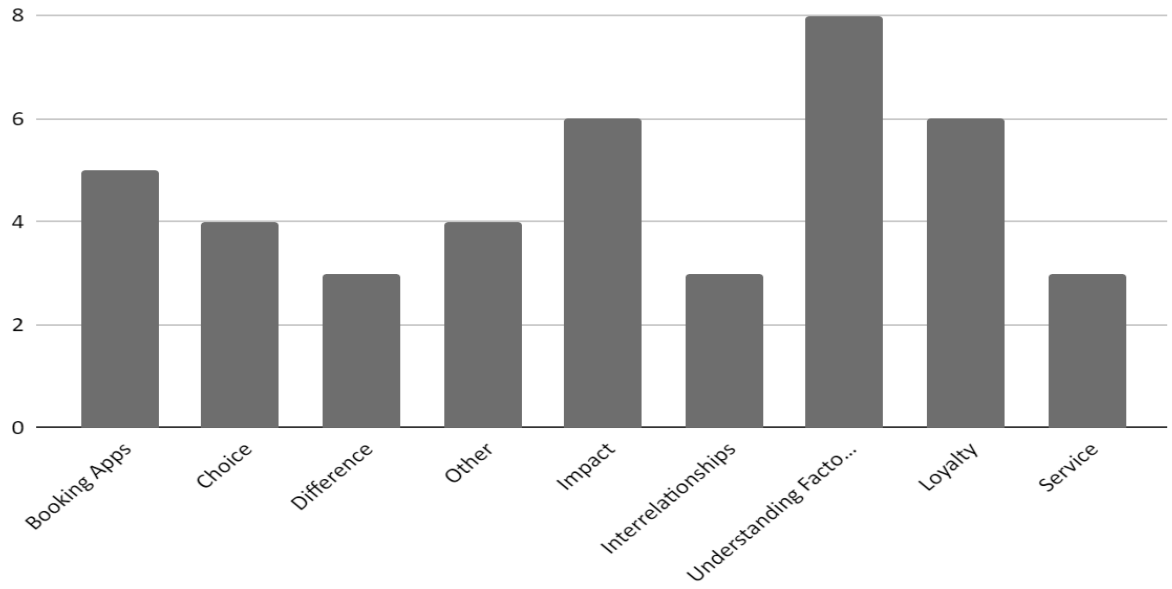


Source: the result of a literature review using Microsoft Excel

When it comes to the classification of downloaded research articles by country, China has published the most, followed by Spain, the United States, Australia, Vietnam, and Singapore. China has the maximum number (15) of published research articles among those downloaded.

2.2.4 Classification according to key area

Fig 2.4

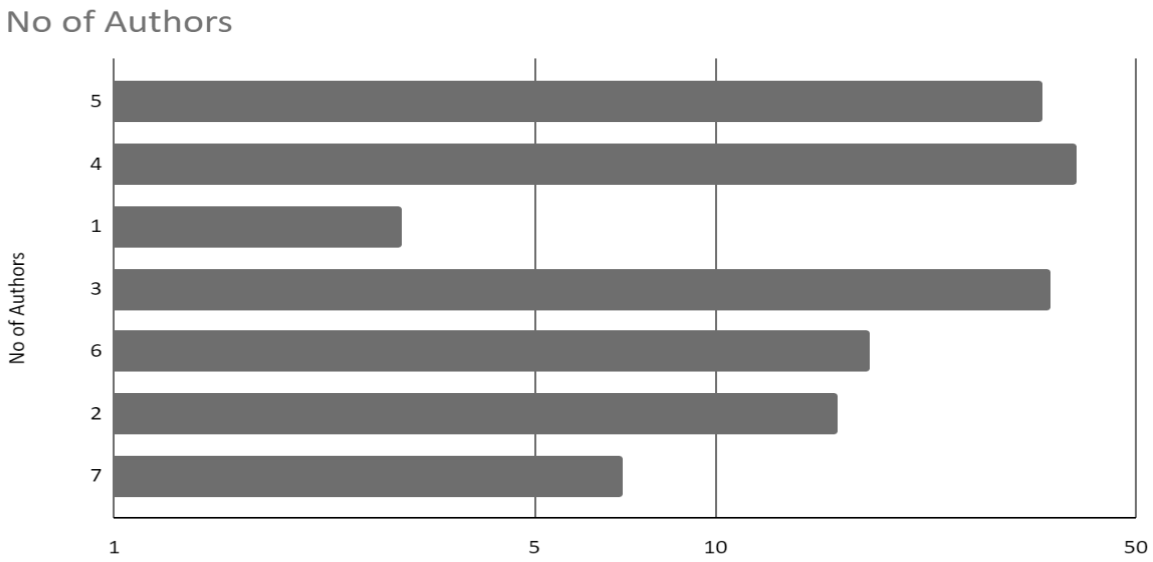


Source: the result of a literature review using Microsoft Excel

The key area in this case refers to the area The research papers have studied most, and this data was collected by downloading more than 45 search papers from The ScienceDirect, Elsevier, Scopus, Google Scholar, JSTOR, ResearchGate, and other platforms. Data from research publications was classified and integrated using an Excel sheet, resulting in the graphic shown above. According to this chart, the majority of studies have studied the variables influencing customers, which are followed by loyalty and. Then there are booking applications, which means that researchers have evaluated the technology aspect, and impact, which means that some researchers have analyzed the influence of both online and offline taxis on each other, as well as on consumers or passengers. When it comes to the classification of downloaded research articles according to nations, it can be seen that China has published the most research papers compared to other countries, followed by Spain.

2.2.5 Classification according to number of authors

Fig 2.5



Source: the result of a literature review using Microsoft Excel

According to several authors, it refers to the number of sub-authors or the total number of authors 1 research paper had.

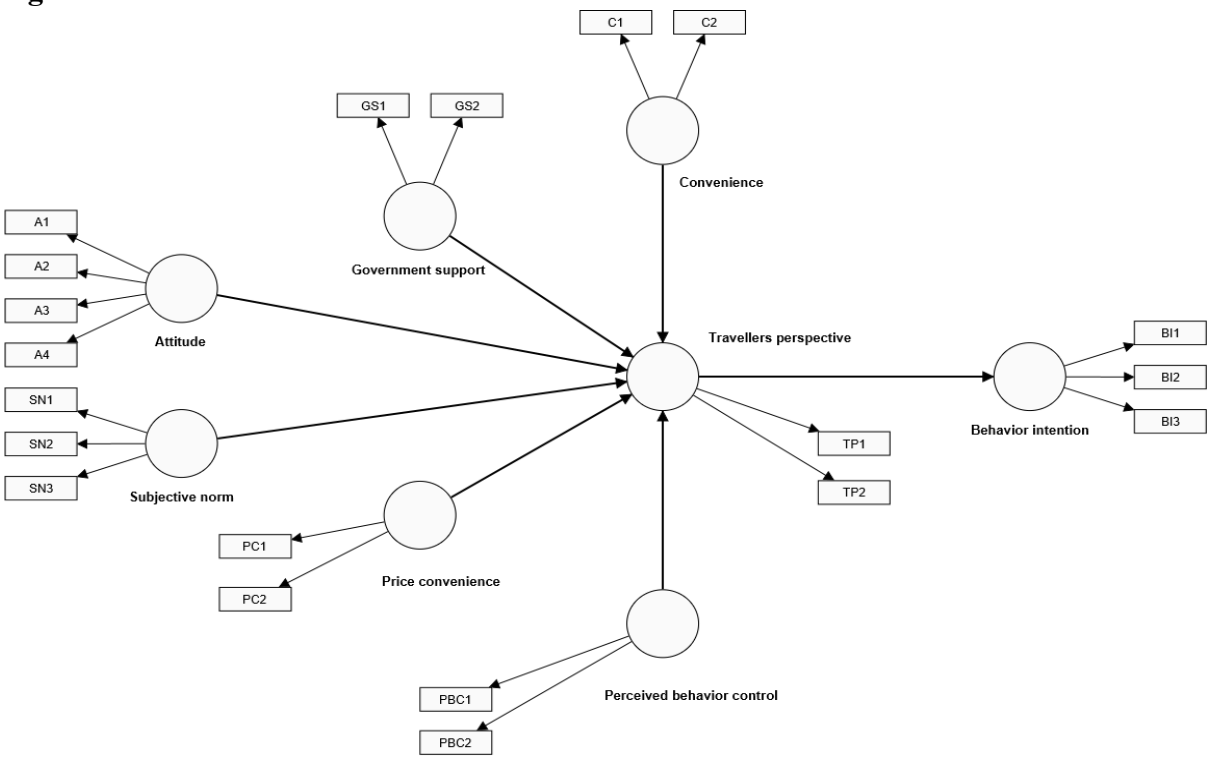
2.2.6 Classification according to the Theory of Planned Behavior

The research was a total of 60 + research papers downloaded The papers were collected using traditional taxi, ride-hailing, theory of planned behavior, tourist, and travel perspectives. From the literature review, it was identified that the topic of ride-hailing and traditional taxis is popular and very wasteful as a whole, and several papers have analyzed this area in different manners with different factors, like some that have analyzed the peach hours, pricing policies in different localities, operation and framework, the effect of both services on each other, the shared economy, the different demographic profiles, and some that have compared both services. The Theory of Planned Behavior (TPB) is an effective technique for predicting and analyzing a variety of actions, including those linked to travel.

As previously said, the capacity to reproduce and forecast occurrences is critical in every scientific inquiry. By seeing phenomenon A and evaluating its effects, we may lay the groundwork for forecasting the outcomes of comparable occurrences given the same beginning conditions. This prediction enables greater control and management of future developments. The TPB has been effectively used in a variety of disciplines, including healthcare, substance abuse, safe sex practices, fitness, and more. Its applications cover a wide range of behaviors, including dietary habits, behavioral control, contraceptive use, dental hygiene practices, environmental behaviors, physical activity, seat belt use, and workplace injury prevention.(Ajzen, 1991,Ajzen, 2020,Yuriev et al., 2020) The theory of planned behavior examines how travelers choose their behavior when deciding between traditional taxi services and ride-hailing services. It also takes into account the external perception, which includes the cost perception—which refers to the traveler's psychological assessment of the cost and time—and speed perception—which is the speed at which the traveler moves—as well as the convenience and comfort perception—which includes waiting times, the state of the cars, the level of service, and the availability of information.(Hu et al., 2022) how control, reliability, and privacy on the Internet affect real buying behavior. According to TPB, people's intentions to make an online purchase are influenced by their beliefs, the opinions of others, and their sense of control. have demonstrated via TPB the significance of emotions, social effects, and perceived control in online purchasing decisions. Researchers may use TPB to determine why consumers make particular decisions when they purchase online, which can help businesses enhance the online shopping experience for all customers. (George, 2004)

2.3 Proposed model

Fig 2.6



Source: (Hu et al., 2022;Ajzen, 1991;Ajzen, 2020;Chen et al., 2023;De Miguel Molina et al., 2021;Nguyen-Phuoc et al., 2020;Lee & Wong, 2021)

2.3.1 Theory of planned behavior:

According to the concept, a person is perfectly reasonable when selecting a certain action and decides whether or not to carry it out based on the information that is provided. Previous research has established that planned behavior theory is applicable and accurate in the field of transportation for forecasting the intentions and behaviors of consumers/customers. (Hu et al., 2022; Gupta, 2021; George, 2004; Quintal et al., 2015; Tan et al., 2017)

2.3.2 Explanation of Contracts

According to the theory of planned behavior (Hu et al., 2022;Ajzen, 1991;Ajzen, 2020)

Attitude - The person's overall assessment of the conduct, which is indicative of the person's preferred behavior

Subjective norms - The peer pressure a person experiences when carrying out a choice

Perceived behavior control - The awareness of one's own experiences, opportunities, and resources

Behavior intention - The person's willingness to carry out a specific task

Additional contracts

Price convenience -individuals' willingness to spend a particular sum of consideration to enjoy their service (Chen et al., 2023)

Convenience -Convenience is referred to as how convenient the individual is to use a particular service, which influences his behavior and intention. (Nguyen-Phuoc et al., 2020)

Government support - Support from the government is referred to as the individual's perception of whether the individual believes that the government should support any particular service, in this case, the online and offline taxi service, and whether this will benefit the individual indirectly or directly. For example, suppose the individual believes that the government should support and promote the taxi service. In that case, there is a chance that more taxis will be available, increasing their convenience. (De Miguel Molina et al., 2021)

Traveler perspective - It means what the traveler thinks or what perspective he or she has about a particular service. (Nguyen-Phuoc et al., 2020;Lee & Wong, 2021)

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Study design

In the research, internet and offline taxi services are contrasted. The two primary sections of the study are the analysis, which is completed independently for both online and offline taxi services, and a comparison of the final product between the two services. Additionally, the information is gathered with consideration for both services using a single questionnaire that has distinct questions for each service, and the information is then evaluated appropriately.

3.2 Scale development

Before creating the survey, the research examined previous studies' questionnaires. If the newly formulated questionnaire's validity and reliability are confirmed, then some components from the current studies' questionnaires may be included provided they meet the study objectives (Hair et al. 2013). Twenty items were created for each of the services mentioned in the survey questionnaire; altogether, forty items were chosen to be included in the questionnaire with eight contracts. Four new constructs were introduced to the theory of planned behavior: pricing convenience, government support, convenience, and traveler viewpoint. The original four constructs of the theory of planned behavior are perceived behavioral control, attitude, subjective norms, and behavior interaction. The questionnaire was developed using a 5-point licked scale to design the questionnaire and related items, taking into account the habits, choices, attitudes, preferences, etc. of the respondents

3.3 Data collection

The data was collected by disseminating the questionnaire online (WhatsApp, Instagram) and offline platforms, face-to-face collection (a copy of the survey form was given to people in popular areas of Goa). A total of 408 respondents answered the questionnaire out of which a total of 362 responses were considered for analyzing the data and the remaining were rejected

as it had a standard deviation of 0 for analysis The service was distributed to the local people of Goa as well as tourists visiting Goa, out of which 246 were residents of Goa and 162 were tourists visiting Goa, with a male-to-female ratio of approximately 50-50.

3.4 Data analysis

The collected data is analyzed using Jamovi software and smart PLS software. Descriptive statistics are done in Jamovi software, and two models are developed in Smart-PLS: the measurement model and the structural model assessment.

For the measurement model, the tests are shown in two separate forms: offline taxi and online taxi, and the PSSM algorithm is run twice for both types of service. Using Cronbach's alpha, composite reliability (rho_c), and average variance extraction, the outer loading matrix, construct reliability, and validity were assessed. In order to assess the model's discriminant validity and reliability, the Ford Larcker was also considered. A separate study was done on the measuring model for offline and online taxi services. and the test of the same is given separately for both services.

The structure model was tested in Smart-PLS using bootstrapping, path coefficient analysis, and the provided data's P- and T-values. Additionally, the test results for both online and offline taxis are displayed on the same table.

3.5 Descriptive statistical analysis

Table 3.1: Frequency of demographic profile

Characteristics	Frequency (N)	%
Gender		
Male	193	53.3 %
Female	169	46.7 %
Age		
Below 25	191	52.8 %
26-35	78	21.5 %
36-50	61	16.9 %
51 or above	32	8.8 %
Residence location		
A resident of Goa	216	59.7 %
Tourists visiting Goa	146	40.3 %
Educational qualifications		
Up to 12th or below	66	18.2 %
Graduation	159	43.9 %
Post Graduation or above	137	37.8 %
Occupation		
Student	122	33.7 %
Student and part-time employee	158	43.6 %
Employed/self-employed	69	19.1 %
Housework, unemployed, or retired	13	3.6 %
Monthly incomes		
Less than 50000	198	54.7 %
50000-100000	78	21.5 %
100000-500000	67	18.5 %
More than 500000	19	5.2 %
low many times did you use a taxi in a year?		
1-4 times	189	52.2 %
More than 5 times	53	14.6 %
More than 10 times	77	21.3%
I use taxis regularly	43	11.9%

Source: result of primary data analysis using Jamovi

Interpretation

In table 3.1 the demographic profile of respondents was analyzed, and for this, a total of 409 respondents answered the questionnaire through online and offline platforms, out of which a total of 362 respondents were taken into account after removing all outliers from the data. In the demographic profile, the frequency of respondents was analyzed through Jamovi software version 2.3.28. A total of 362 respondents —193 men and 169 women—make up the dataset. 191 respondents are under 25 age, 78 are between the ages of 26 and 35, 61 are between the ages of 36 and 50, and 32 are beyond the age of 51. A total of 216 (59.7 %) respondents said they were from Goa, while 146 (40.3 %) said they were tourists visiting the state. In terms of educational background, 159 respondents have graduated, 137 have a postgraduate degree or above, and 66 respondents have only completed up to the 12th grade. Regarding occupation, 122 respondents work as students, 158 are part-time workers and students, 69 are employed or self-employed, and 13 are retired or unemployed. In terms of monthly earnings, 198 participants make less than rupees 50,000, 78 fall between rupees 50,000 and rupees 100,000, 67 fall between rupees 100,000 and rupees 50,000, and 19 surpass rupees 50,000. 189 respondents said they use cabs 1-4 (52.2 %)times a year, 53 (14.6 %) said they use them more than 5 times, 77 (21.3%) said they use them more than 10 times, and 43(11.9%) said they use them frequently. These figures show that the respondent population has a varied demographic profile and varies in how often they use taxis

3.6: OFFLINE TAXI

3.6.1: Measurement model in structural equation modeling (SEM) using Partial Least Squares (PLS)

Table 3.2: Construct reliability and validity testing

Items/constructs	Outer loading (OL)	Cronbach's α	Composite reliability	Average variance extracted
Attitude				
A1	0.913	0.817	0.916	0.845
A2	0.926			
Behavior Intention				
B1	0.907	0.873	0.922	0.797
B2	0.912			
B3	0.859			
Convenience				
C1	0.863	0.704	0.871	0.771
C2	0.893			
Governance support				
G1	0.905	0.772	0.898	0.815
G2	0.900			
Perceived Behavior Control				
PBC1	0.939	0.868	0.938	0.883
PBC2	0.941			
Price Consciousness				
PC1	0.888	0.720	0.877	0.781
PC2	0.879			
Subjective Norms				
SN1	0.888	0.830	0.898	0.745
SN2	0.879			
SN3	0.868			
Travelers Perception				
TP1	0.914	0.813	0.914	0.842
TP2	0.922			

Source: result of primary data analysis using SmartPLS

3.6.2: Discriminant validity

Table 3.3: Fornell-Larcker criterion (offline taxi)

Constructs	A	BI	C	GS	PBC	PC	SN	TP
A	0.919							
BI	0.789	0.893						
C	0.623	0.630	0.878					
GS	0.673	0.640	0.515	0.903				
PBC	0.778	0.848	0.659	0.603	0.940			
PC	0.641	0.630	0.628	0.509	0.623	0.884		
SN	0.799	0.761	0.639	0.692	0.767	0.619	0.863	
TP	0.769	0.831	0.636	0.634	0.803	0.586	0.755	0.918

Source: result of primary data analysis using SmartPLS

Interpretation

Using SmartPLS software to evaluate the measurement model for offline taxi services provides important insights into constructing model fit. The following tests were considered Contract reliability and validity were examined using Cronbach's alpha, composite reliability, and average variance extraction, and discriminant validity was examined through the Fornell-Larcker criterion. Following the upload of the PLS-SEM algorithm test, it was discovered that items A3 and A4 did not meet the trash heap limit of (Hair et al., 2023) Cronbach's alpha and the composite reliability was less than 0.70. The extracted average variance was also less than 0.5 The items were removed since there was neither decreased variety nor internal consistency (Hair et al., 2013). The items under Attitude, A3 and A4, were found to not fulfill the criteria when the PLS-SEM -algorithm test was conducted in Smart PLS. Therefore, the decision was made to remove them.

According to Table 3.2 to determine the Convergent validity of the model, the Factor loading of items was used and all the values were above the threshold of 0.708 (Hair et al., 2013) which indicates the measurement model passes through the internal consistency of its underlying construct. Construct reliability and validity were tested by using Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) (Hair et al., 2023) All the values follow the threshold limit, and (B1-0.873) is the highest, which suggests that the questionnaire highly measures behavior intention. The Discriminant validity in the Fornell-Larcker criterion suggests that no items of contracts are not overlapping with each other. Furthermore, the assessment of construct reliability, validity, and discriminant validity reveals resilience in measuring latent variables for the majority of constructs, as evidenced by significant outer loadings, Cronbach's alpha, composite reliability, and average variance extracted (Diamantopoulos & Siguaw, 2006). (Castanha et al., n.d.)The Fornell-Larcker criterion further supports discriminant validity, showcasing higher correlations between constructs and their respective indicators than with other constructs. These results indicate that the measuring model used in the dissertation study is sound, with excellent construct validity and reliability. The measuring equipment's accuracy and consistency have been considered reliable due to their high outer loadings, Cronbach's alpha values, composite reliability scores, and AVE values. This establishes a strong basis for the future measurement mode.

3.7: ONLINE TAXI

3.7.1: Measurement model in structural equation modeling (SEM) using Partial Least Squares (PLS)

Table 3.4: Construct reliability, validity, and Discriminant validity testing

Items/constructs	Outer loading (OL)	Cronbach's α	Composite reliability	Average variance extracted
Attitude				
A1	0.875	0.745	0.886	0.796
A2	0.908			
Behavior Intention				
B1	0.888			
B2	0.878	0.831	0.899	0.747
B3	0.826			
Convenience				
C1	0.895	0.237	0.706	0.559
C2	0.562			
Governance support				
G1	0.868	0.691	0.866	0.764
G2	0.880			
Perceived Behavior Control				
PBC1	0.939	0.867	0.938	0.882
PBC2	0.940			
Price Consciousness				
PC1	0.818	0.622	0.840	0.724
PC2	0.882			
Subjective Norms				
SN1	0.850			
SN2	0.858	0.806	0.884	0.718
SN3	0.834			
Travelers Perception				
TP1	0.881	0.756	0.891	0.803
TP2	0.911			

Source: result of primary data analysis using SmartPLS

3.7.2: Discriminant validity

Table 3.5: Fornell-Larcker criterion (online taxi)

Constructs	A	BI	C	GS	PBC	PC	SN	TP
A	0.892							
BI	0.759	0.864						
C	0.487	0.535	0.747					
GS	0.625	0.620	0.488	0.874				
PBC	0.712	0.799	0.552	0.582	0.939			
PC	0.485	0.542	0.505	0.441	0.529	0.851		
SN	0.751	0.730	0.557	0.676	0.723	0.511	0.847	
TP	0.671	0.802	0.507	0.580	0.709	0.481	0.643	0.896

Source: result of primary data analysis using SmartPLS

Interpretation

Similar to offline taxi SmartPLS software to evaluate the measurement model for online taxi services provides important insights constructing model fit. The following tests were considered Contract reliability and validity were examined using Cronbach's alpha, composite reliability, and average variance extraction, and discriminant validity was examined through the Fornell-Larcker criterion. Following the upload of the PLS-SEM algorithm test, it was discovered that items A3 and A4 did not meet the trash heap limit of (Hair et al., 2023) Cronbach's alpha and the composite reliability was less than 0.70. The extracted average variance was also less than 0.5 The items were removed since there was neither decreased variety nor internal consistency (Hair et al., 2013). The items under Attitude, A3 and A4, were found to not fulfill the criteria when the PLS-SEM -algorithm test was conducted in Smart PLS. Therefore, the decision was made to remove them.

According to the outer loading of online taxis, all the values of items are above the threshold of 0.708 except C2 which is 0.562 which is also acceptable according to (Vinzi et al., 2010)

which indicates the measurement model passes through internal consistency and convergent validity criteria. The convergent validity criteria. determining the Construct reliability and validity by using Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) All the values follow the threshold limit, and B1-0.873 is the highest, which suggests that behavior intention is highly measured by the questionnaire. The Discriminant validity in the Fornell-Larcker criterion suggests that no items of contracts overlap with each other The evaluation of the measurement model for online taxi services utilizing SmartPLS software reveals crucial insights into constructing relationships and model fit. These results indicate that the measuring model used in the dissertation study is sound, with excellent construct validity and reliability. The measuring equipment's accuracy and consistency have been considered reliable due to their high outer loadings, Cronbach's alpha values, composite reliability scores, and AVE values. This establishes a strong basis for the future measurement mode.

3.7.3: Structural model in Partial Least Squares Structural Equation Modeling (PLS-SEM)

Table 3.6: Inner model - List VIF

Constructs	Offline Taxi	Online taxi
Attitude -> Travelers Perception	3.74	2.77
Convenience -> Travelers Perception	2.13	1.69
Governance support -> Travelers' Perception	2.09	2.02
Perceived Behavior Control -> Travelers Perception	3.24	2.65
Price Consciousness -> Travelers Perception	2.04	1.57
Subjective Norms -> Travelers Perception	3.70	3.20
Travelers Perception -> Behavior Intention	1.00	1.00

Source: result of primary data analysis using SmartPLS

Table 3.7 Goodness-of-Fit Test

Variables	Traditional tax	Ride-hailing taxi
	R-square	
Behavior intention	0.643	0.690
Travelers perspective	0.584	0.720

Source: result of primary data analysis using SmartPLS

Table 3.8: Statistical results of the structural model (offline taxi and online taxi)

Variables	Traditional taxi services			Ride-hailing services		
	Path coefficients	t statistics	p values	Path coefficients	t statistics	p values
A -> TP	0.215	3.113	0.002 *	0.230	3.138	0.002*
C -> TP	0.094	1.453	0.146	0.076	1.269	0.205
GS -> TP	0.096	1.958	0.050*	0.129	2.144	0.032 *
PBC -> TP	0.403	5.689	0.000 *	0.363	4.936	0.000*
PC -> TP	-0.003	0.056	0.956	0.058	1.201	0.230
SN -> TP	0.149	2.386	0.017 *	0.049	0.588	0.557
TP -> BI	0.831	41.420	0.000 *	0.802	27.923	0.000*

**Significant at 0.05.* *Source: the result of primary data analysis using SmartPLS*

Interpretation

Building connections may be facilitated by assessing the structural models of offline and online taxi services using SmartPLS software. The presence or absence of varying degrees of multicollinearity between the components was assessed using the variance inflation factor (VIF). The worth of the as well (Whelehan et al., 1983) and it is noted that the value of vIF was less than 5 for both ride-hailing (online taxis) and traditional taxis (offline taxis), indicating that there is no multicollinearity among the contracts and that each contract is

offering distinct information that is not repeated to explain the variation in the dependent variable.

The sign, magnitude, and significance of the path coefficients about the structural linkages were examined in addition to the R values to assess the structural model. For bootstrapping, 5,000 samples were employed (Streukens & Leroi-Werelds, 2016). A two-tailed test was used to assess each hypothesis's statistical significance. In addition, the path coefficients value (ß) is used to estimate the structural model assessment. This value assesses the degree of significance (p-value) of the relationship between variables, and a value is considered significant when p= <0.05 (Hair, Black, Jr, et al., 2019). By utilizing the R2 values, verifying that the model satisfies the explanatory requirements was feasible. The traditional taxi (offline taxi) model explains 64% of the variation in travelers' perspectives and 58% of the variance in behavioral intention. In respect of ride-hailing (online taxi), the model explains 72% of the variation in travelers' perspectives and 69% of the variance in Behavior intention.

In the structural model analysis for both offline and online taxi services, several significant pathways emerge Significant path coefficients are shown by Attitude (A), Perceived Behavior Control (PBC), and Subjective Norms (SN), suggesting that these factors have a significant impact on Travelers Perspective (TP) in both offline and online taxis. In particular, there is high evidence for connections ($p < 0.05$) for the route coefficients A -> TP (0.215 offline, 0.230 online), PBC -> TP (0.403 offline, 0.363 online), and SN -> TP (0.149 offline, 0.049 online). Furthermore, with path coefficients of 0.831 for offline services and 0.802 for online services, both significant at $p < 0.05$, TP considerably affects Behavior Intention (BI) in both offline and online services. Convenience (C), Governance Support (GS), and Price Consciousness (PC), however, have little to no effect on TP either offline or online taxis. These results underscore the crucial role of attitude, perceived control, and subjective norms in shaping customers' perceptions and intentions regarding taxi services, regardless of the service delivery mode.

When comparing the two service kinds, it is clear that although variables like attitude and perceived behavior control usually affect passengers' opinions of both traditional and ride-hailing cab services, the degree of these relationships may differ slightly. Moreover, both models' non-significant path coefficients for price consciousness and convenience point to possible areas for industry improvement. All things considered, the results highlight the intricacy of the variables influencing customer behavior in the taxi industry and stress the necessity of customized approaches to maximize service excellence and raise customer contentment in offline and online environments.

Table 3.9: Hypothesis test results table

Hypothesis	Decision	
	Traditional taxi	**Ride-hailing taxi**
HO1: Price convenience has a positive influence on the t raveler's perspective	NO	NO
HO2: Convenience has a positive influence on the traveler's perspective	NO	NO
HO3: Government support has a positive influence on the traveler's perspective	YES	YES
HO4: Subjective norms have a positive influence on the traveler's perspective	YES	NO
HO5: Attitude has a positive influence on the traveler's perspective	YES	YES
HO6: Perceived behavior control has a positive influence on the traveler's perspective	YES	YES
HO7: Travelers' perceptions have a favorable impact on behavior intention.	YES	YES

Source: result of primary data analysis using SmartPLS

Interpretation

The analysis reveals mixed support for the hypotheses across traditional and ride-hailing taxi services. Attitude (A), perceived behavior control (PBC), government support (GS), and the correlation between traveler perspective (TP) and behavior intention (BI) are among the variables that consistently show support in both service types, suggesting that they have a

major impact on customer behavior. The convenience (C) and price consciousness (PC) hypotheses, on the other hand, show varying degrees of support, indicating differing effects on visitors' views across the two service models. Additionally, the hypothesis regarding subjective norms (SN) and their influence on TP is supported in traditional taxis but not in ride-hailing services. These results highlight the complex interactions between variables influencing passenger behavior in the taxi sector, highlighting the necessity of customized approaches to improve service quality and consumer satisfaction across both offline and online platforms. (Geisser, 1974)

CHAPTER 4: FINDINGS AND CONCLUSIONS

4.1 Findings of Traditional Taxi Service

The analysis indicates mixed support for the hypotheses across traditional and ride-hailing taxi services. Attitude (A), Perceived Behavior Control (PBC), Government Support (GS), and the correlation between Travelers Perspective (TP) and Behavior Intention (BI) are among the variables that consistently show support in both service types, suggesting that they have a major impact on customer behavior. Convenience (C) and price consciousness (PC) hypotheses, on the other hand, show varying degrees of support, indicating differing effects on visitors' views across the two service models. Additionally, the hypothesis regarding Subjective Norms (SN) and its influence on TP is supported in traditional taxis but not in ride-hailing services. These results highlight the complex interactions between variables influencing passenger behavior in the taxi sector, highlighting the necessity of customized approaches to improve service quality and enhance consumer satisfaction across both offline and online platforms.

4.2: Findings of ride-hailing taxi service

Online taxi services show strong validity and reliability across all constructs, much like offline taxi services do. Travelers Perspective (TP) shows positive and substantial correlations with Attitude (A), Governance Support (GS), and Perceived Behavior Control (PBC), demonstrating their influential roles in shaping users' perceptions. Like the offline model, the online taxi model does not find statistical significance in the impact of Convenience (C) and Price Consciousness (PC) on TP. This implies that the influence of these elements on users' viewpoints in both service types might be restricted. Furthermore, in the online taxi model, the route coefficient from TP to Behavior Intention (BI) is exceptionally high, suggesting that users strongly intend to convert their perceptions into real

behavior. In general, the online taxi business model shows as well strong construct validity and highlights the importance of factors such as Attitude, Governance Support, and Perceived Behavior Control in shaping users' perceptions and intentions.

4.3. Conclusion

The examination of taxi services, both online and offline, provides detailed information about the variables affecting users' opinions and plans. Strong validity and reliability are seen in the offline taxi model for dimensions including Perceived Behavior Control, Governance Support, and Attitude, suggesting that these concepts play important roles in influencing users' viewpoints. Convenience and price consciousness have a limited impact, though, and there is room for growth in improving customer experiences. Likewise, the online taxi model shows good validity and reliability; aspects that matter include perceived behavior control, governance support, and attitude. Convenience and price consciousness, however, have a negligible impact, which emphasizes the importance of paying attention to these factors. Despite these variations, both models emphasize how important it is to have an attitude, support from governance, and perceived behavior control in driving users' perceptions and intentions to utilize taxi services.

4.4 Suggestions

1. Based on the data, it is evident that the travelers want both services to be supported by the government. As a result, hiring a taxi at any time should be simple by supporting both services, each of which has pros and cons.
2. Both services should be easily available and convenient to accommodate the population's tastes and allow consumers to hire cabs without fear.
3. The government should also support the taxi drivers of both services

4.5 Limitation of study

1. During the survey process, some respondents gave open-ended suggestions for improving taxi services in Goa that, because of time limitations, could not be included in the study.
2. Some respondents did not take the questionnaire seriously, and because of that, the standard deviation was 0 and a total of 47 responses had to be deleted.

4.6 Further study

1. It is possible to compare the two services in more detail and take into account other variables.
2. Another void can be filled by carefully examining the respondents' demographic profile.
3. The Indian cab sector has not been the subject of much research. There are still more regions to investigate.

References :

A Study of Taxi Aggregators in India: Opportunities and Challenges. (n.d.). *DELHI SCHOOL OF MANAGEMENT Delhi Technological University*.

A., & A. (2023, July 28). *THE INDIAN TAXI MARKET- HISTORY AND THE CURRENT SCENARIO- – Copy - OOR Cabs*. OOR Cabs - a New Gen Taxi Market Place. https://oorcabs.com/the-indian-taxi-market-history-and-the-current-scenario-copy/

Aguilera-García, L., Gomez, J., Velázquez, G., & Vassallo, J. M. (2022, January). Ridesourcing vs. traditional taxi services: Understanding users' choices and preferences in Spain. *Transportation Research Part A: Policy and Practice*, *155*, 161–178. https://doi.org/10.1016/j.tra.2021.11.002

Aguilera-García, L., Gomez, J., Velázquez, G., & Vassallo, J. M. (2022, January). Ridesourcing vs. traditional taxi services: Understanding users' choices and preferences in Spain. *Transportation Research Part A: Policy and Practice*, *155*, 161–178. https://doi.org/10.1016/j.tra.2021.11.002

Ajzen, I. (1991, December). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-t

Ajzen, I. (2020, June 10). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, *2*(4), 314–324. https://doi.org/10.1002/hbe2.195

Akimova, T., Arana-Landín, G., & Heras-Saizarbitoria, I. (2020, June). The economic impact of Transportation Network companies on the traditional taxi Sector: An empirical study in Spain. *Case Studies on Transport Policy*, *8*(2), 612–619. https://doi.org/10.1016/j.cstp.2020.02.002

Barbour, N., Zhang, Y., & Mannering, F. (2020, March). An exploratory analysis of the role of socio-demographic and health-related factors in ridesourcing behavior. *Journal of Transport & Health*, *16*, 100832. https://doi.org/10.1016/j.jth.2020.100832

Castanha, Shirodkar, & K. B. Pillai. (n.d.). An Empirical Study on Continuance Intention to Use Mobile Payment Applications in Goa, India. *International Journal of Banking, Risk and Insurance*. http://www.publishingindia.com/IJBRI/56/an-empirical-study-on-continuance-intention-to-use-mobile-payment-applications-in-goa-india/31985/76613/

Chen, Y., Geng, M., Zeng, J., Yang, D., Zhang, L., & Chen, X. M. (2023, October). A novel ensemble model with conditional intervening opportunities for ride-hailing travel mobility estimation. *Physica A: Statistical Mechanics and Its Applications*, *628*, 129167. https://doi.org/10.1016/j.physa.2023.129167

Contreras, S. D., & Paz, A. (2018, September). The effects of ride-hailing companies on the taxicab industry in Las Vegas, Nevada. *Transportation Research Part A: Policy and Practice*, *115*, 63–70. https://doi.org/10.1016/j.tra.2017.11.008

De Miguel Molina, M., De Miguel Molina, B., Catalá Pérez, D., & Santamarina Campos, V. (2021, December). Connecting passenger loyalty to preferences in the urban passenger transport: Trends from an empirical study of taxi vs. VTC services in Spain. *Research in Transportation Business & Management*, *41*, 100661. https://doi.org/10.1016/j.rtbm.2021.100661

Department Of Transport,Government Of Goa. (n.d.). https://goatransport.gov.in/About

Department Of Transport,Government Of Goa. (n.d.). https://goatransport.gov.in/FareChart

Department Of Transport,Government Of Goa. (n.d.). https://goatransport.gov.in/KnowRentedVehicle

Diamantopoulos, A., & Siguaw, J. A. (2006, June 16). Formative Versus Reflective Indicators in Organizational Measure Development: A Comparison and

Empirical Illustration. *British Journal of Management*, *17*(4), 263–282. https://doi.org/10.1111/j.1467-8551.2006.00500.x

Dzisi, E. K., Ackaah, W., Aprimah, B. A., & Adjei, E. (2020, March). Understanding demographics of ride-sourcing and the factors that underlie its use among young people. *Scientific African*, *7*, e00288. https://doi.org/10.1016/j.sciaf.2020.e00288

Geisser, S. (1974, April). A Predictive Approach to the Random Effect Model. *Biometrika*, *61*(1), 101. https://doi.org/10.2307/2334290

George, J. F. (2004, July 1). The theory of planned behavior and Internet purchasing. *Internet Research*, *14*(3), 198–212. https://doi.org/10.1108/10662240410542634

Gupta, V. (2021, October). Validating the theory of planned behavior in green purchasing behavior. *SN Business & Economics*, *1*(10). https://doi.org/10.1007/s43546-021-00148-4

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021, June 30). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. SAGE Publications. http://books.google.ie/books?id=AVMzEAAAQBAJ&dq=hair,hult,ringle&hl=&cd=2&source=gbs_api

Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2013, April 3). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. SAGE. http://books.google.ie/books?id=IFiarYXE1PoC&printsec=frontcover&dq=hair,hult,ringle&hl=&cd=4&source=gbs_api

Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2023, August 21). *Advanced Issues in Partial Least Squares Structural Equation Modeling*. SAGE Publications. http://books.google.ie/books?id=4OK9EAAAQBAJ&pg=PA2015&dq=advanced+issues+partial+least&hl=&cd=1&source=gbs_api

Hu, X., Lin, W., Wang, J., & Jiang, J. (2022, June). Choice of ride-hailing or traditional taxi services: From travelers' perspectives. *Research in Transportation Business & Management*, *43*, 100788. https://doi.org/10.1016/j.rtbm.2022.100788

India Taxi Market Insights. (n.d.). https://www.mordorintelligence.com/industry-reports/india-taxi-market

Khuong, M. N., & Dai, N. Q. (2016). The Factors Affecting Customer Satisfaction and Customer Loyalty — A Study of Local Taxi Companies in Ho Chi Minh

City, Vietnam. *International Journal of Innovation, Management and Technology*, 228–233. https://doi.org/10.18178/ijimt.2016.7.5.678

Lee, C. K. H., & Wong, A. O. M. (2021, July). Antecedents of consumer loyalty in ride-hailing. *Transportation Research Part F: Traffic Psychology and Behaviour*, *80*, 14–33. https://doi.org/10.1016/j.trf.2021.03.016

Li, X., Du, M., Zhang, Y., & Yang, J. (2022, October). Identifying the factors influencing the choice of different ride-hailing services in Shenzhen, China. *Travel Behaviour and Society*, *29*, 53–64. https://doi.org/10.1016/j.tbs.2022.05.006

Lyu, T., Wang, P. S., Gao, Y., & Wang, Y. (2021, February). Research on the big data of traditional taxi and online car-hailing: A systematic review. *Journal of Traffic and Transportation Engineering (English Edition)*, *8*(1), 1–34. https://doi.org/10.1016/j.jtte.2021.01.001

Mezuláník, J., Durda, L., Civelek, M., & Malec, L. (2020, June 30). Ride-hailing vs. Taxi Services: a Survey-based Comparison. *Journal of Tourism and Services*, *11*(20), 170–186. https://doi.org/10.29036/jots.v11i20.155

Nguyen-Phuoc, D. Q., Su, D. N., Tran, P. T. K., Le, D. T. T., & Johnson, L. W. (2020, April). Factors influencing customer's loyalty towards ride-hailing taxi services – A case study of Vietnam. *Transportation Research Part A: Policy and Practice*, *134*, 96–112. https://doi.org/10.1016/j.tra.2020.02.008

Nguyen-Phuoc, D. Q., Tran, P. T. K., Su, D. N., Oviedo-Trespalacios, O., & Johnson, L. W. (2021, July). The formation of passenger loyalty: Differences between ride-hailing and traditional taxi services. *Travel Behaviour and Society*, *24*, 218–230. https://doi.org/10.1016/j.tbs.2021.04.006

Pan, R., Yang, H., Xie, K., & Wen, Y. (2020, June 30). Exploring the Equity of Traditional and Ride-Hailing Taxi Services during Peak Hours. *Transportation Research Record: Journal of the Transportation Research Board*, *2674*(9), 266–278. https://doi.org/10.1177/0361198120928338

Quintal, V. A., Thomas, B., & Phau, I. (2015, February). Incorporating the winescape into the theory of planned behaviour: Examining 'new world' wineries. *Tourism Management*, *46*, 596–609. https://doi.org/10.1016/j.tourman.2014.08.013

Rayle, L., Dai, D., Chan, N., Cervero, R., & Shaheen, S. (2016, January). Just a better taxi? A survey-based comparison of taxis, transit, and ridesourcing services in San Francisco. *Transport Policy*, *45*, 168–178. https://doi.org/10.1016/j.tranpol.2015.10.004

Ride sharing/hailing / online taxi usage by brand in India 2023. (2024, February 14). Statista. https://www.statista.com/forecasts/1348438/ride-sharing-hailing-online-taxi-usage-by-brand-in-india

ROADS AND ROAD TRANSPORT IN INDIA. (1947, August 1). *Journal of the Royal Society of Arts*. https://www.jstor.org/stable/41363454

Roads Transports | Ministry of Road Transport & Highways, Government of India. (n.d.). https://morth.nic.in/road-transport

Salanova, J. M., Estrada, M., Aifadopoulou, G., & Mitsakis, E. (2011). A review of the modeling of taxi services. *Procedia - Social and Behavioral Sciences*, *20*, 150–161. https://doi.org/10.1016/j.sbspro.2011.08.020

Sayed, N. (2021, October 20). *Goa: Only 25% of taxis commit to digital fare meters*. The Times of India. https://timesofindia.indiatimes.com/city/goa/only-25-of-taxis-commit-to-digital-fare-meters/articleshow/87145034.cms

Streukens, S., & Leroi-Werelds, S. (2016, December). Bootstrapping and PLS-SEM: A step-by-step guide to get more out of your bootstrap results. *European Management Journal*, *34*(6), 618–632. https://doi.org/10.1016/j.emj.2016.06.003

Sun, D., & Ding, X. (2019, December). Spatiotemporal evolution of ridesourcing markets under the new restriction policy: A case study in Shanghai. *Transportation Research Part A: Policy and Practice*, *130*, 227–239. https://doi.org/10.1016/j.tra.2019.09.052

Tan, C. S., Ooi, H. Y., & Goh, Y. N. (2017, August). A moral extension of the theory of planned behavior to predict consumers' purchase intention for energy-efficient household appliances in Malaysia. *Energy Policy*, *107*, 459–471. https://doi.org/10.1016/j.enpol.2017.05.027

Taxi-market-in-India-Driving-into-the-future-. (n.d.). Redseer Stragtegy Consultants. Retrieved March 13, 2024, from https://redseer.com/wp-content/uploads/2017/10/58.Taxi-market-in-India-Driving-into-the-future-2014.pdf

Taxi, D. (2023, December 26). *What Are The Waiting Charges For A Taxi? – Drop Taxi In One Way*. Drop Taxi in One Way. https://droptaxiinoneway.com/what-are-the-waiting-charges-for-a-taxi/

Transport - India Transport Sector. (n.d.). https://web.archive.org/web/20151119002640/http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/EXTSARREGTOPTRAN

SPORT/0,,contentMDK:20703625~menuPK:868822~pagePK:34004173~piPK:34003707~theSitePK:579598,00.html

Transport in India. (2024, March 11). Wikipedia. https://en.wikipedia.org/wiki/Transport_in_India#cite_note-roadlengthref-28

Vinzi, V. E., Chin, W. W., Henseler, J., & Wang, H. (2010, March 10). *Handbook of Partial Least Squares*. Springer Science & Business Media. http://books.google.ie/books?id=PPUbvBUvmWoC&printsec=frontcover&dq=handbook+of+partial+least+squares&hl=&cd=1&source=gbs_api

WANG, D., MIWA, T., & MORIKAWA, T. (2022, August). Interrelationships between traditional taxi services and online ride-hailing: empirical evidence from Xiamen, China. *Sustainable Cities and Society*, *83*, 103924. https://doi.org/10.1016/j.scs.2022.103924

Whelehan, O., Johnson, R. A., & Wichern, D. W. (1983). Applied Multivariate Statistical Analysis. *Applied Statistics*, *32*(3), 320. https://doi.org/10.2307/2347962

Yuriev, A., Dahmen, M., Paillé, P., Boiral, O., & Guillaumie, L. (2020, April). Pro-environmental behaviors through the lens of the theory of planned behavior: A scoping review. *Resources, Conservation and Recycling*, *155*, 104660. https://doi.org/10.1016/j.resconrec.2019.104660

Annexure:

Table 1: Questionnaire

1. Gender - Male ☐ Female ☐
2. Age - below less than 25 years ☐ 26-35 ☐ 36-50 ☐ 51 or above ☐
3. Residence location - resident of Goa ☐ tourist visiting Goa ☐
4. Educational Qualification - up to 12th or below ☐ graduation ☐ post graduation or above ☐ other ☐
5. Occupation - student ☐ employed ☐ self-employed/ business ☐ retired ☐
6. Monthly income - less than 25,000 ☐ 50,000-100,000 ☐ 100,000- 500,000 ☐ more than 500,000
7. Family structure - single ☐ couple ☐ nuclear family ☐ joint family ☐
8. Have you ever used - a taxi (offline or local taxi) ☐ app-based taxi (online taxi) eg: goamiles app or other apps ☐ that used both services ☐

9. How many times did you use a taxi in a year?
10. 1-4 times ☐ more than 5 times ☐ more than 10 times ☐ I use a taxi regularly ☐

The overall perception of online and offline taxi service Rate your perception of taxi service on a 1 to 5 scale, where 1 is "strongly disagree" (if you disagree with the statement) and 5 is "strongly agree." (if you agree with the statement)

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

I think the price of the local taxi service is appropriate	
The price of the app-based taxi service is appropriate	
I think local taxi services are costly which is why I prefer app-based taxis	
I think app-based taxis are costly which is why I prefer local taxi services	
Booking apps are convenient for me to travel/hire	
Calling a taxi from the phone/ taxi stand / from the road is convenient for me	
Since I can hire local taxis without a mobile app, hiring a taxi is more simple	
Since I can use the mobile app, hiring a taxi is simple	
I think people experience communication problems with local taxi drivers, such as miscommunication of language.	
I think people experience communication problems with app-based taxi drivers, such as miscommunication of language.	
The possibility of getting dumped by the local taxi service makes me feel unsafe	
The probability of a booked taxi being canceled makes me bothered	
My friend / relative recommended me to use a local taxi service	
My friend / relative recommended me to use an app-based taxi service	
I will travel the same way my relatives and friends travel and use local taxi services.	
I will travel the same way my relatives and friends travel app-based taxi service	

I think the Government should protect local taxis against app-based taxi services	
I think the Government should protect app-based taxi services against local taxi services	
I think new rules and regulations affect the local taxi service	
I think new rules and regulations affect local taxi service	
I think the local taxi service is more Available	
I think app-based taxi services are More Available	
I think local taxi services are better than the app-based taxi service	
I think the app-based taxi services are better than the local taxi service	
I feel safe to use local taxi service	
I feel safe using app-based taxi services	
I assume that overall everyone should use a local taxi service only	
I assume that overall everyone should use app-based taxi services only	
I feel satisfied while taking the local taxi service.	
I feel satisfied while taking the app-based taxi service.	
People whose opinions are valued by me would prefer that I should use a local taxi service	
People whose opinions are valued by me would prefer that I should use an app-based taxi service	
I'm used to taking a local taxi service	
I'm used to taking app-based taxi services	
Local taxi services would be a reliable way to travel	
App-based taxi service would be a reliable way to travel	
It's easy for me to choose a local traditional taxi.	
It's easy for me to choose an app-based taxi service	
I will say positive things about local taxi services and recommend local taxi services to others.	

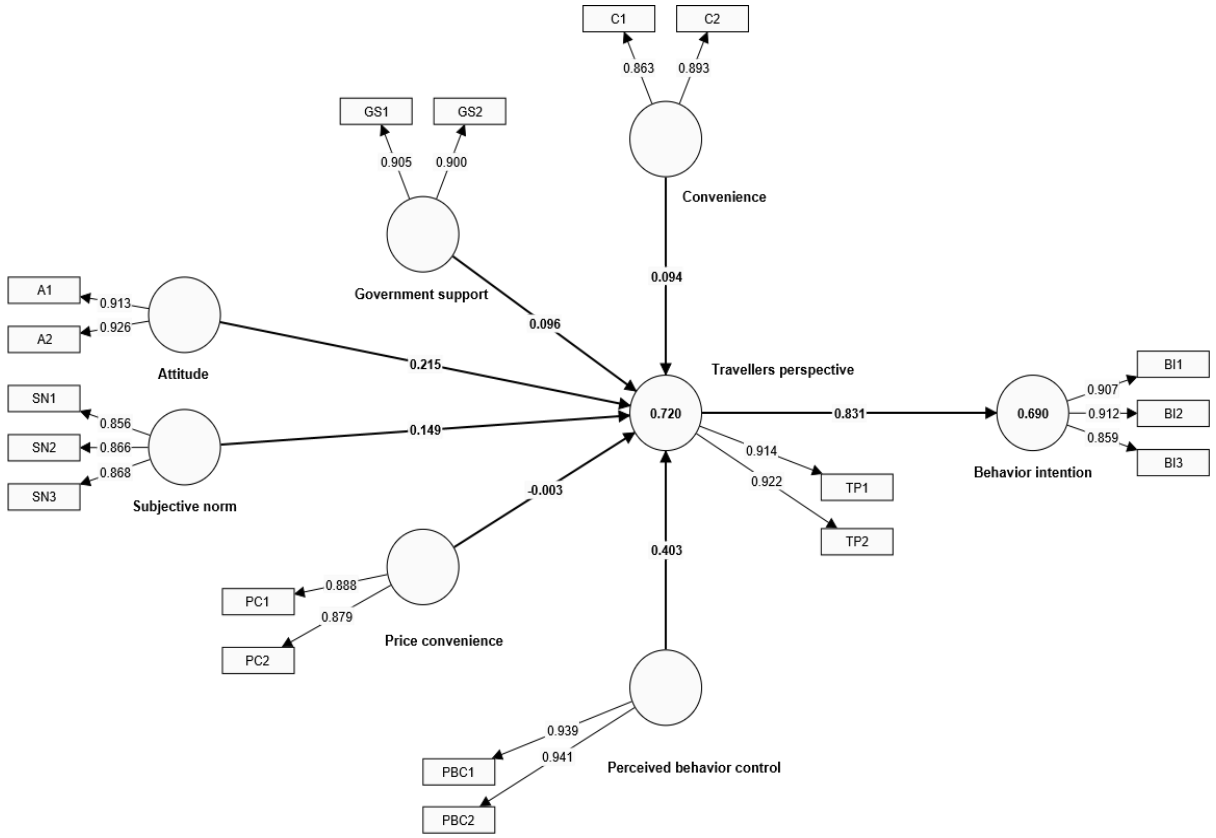
I will say positive things about app-based taxi services and recommend app-based taxis to others.	
I think overall the local taxi service is useful for me	
I think overall the app-based taxi is useful for me	

Table 2: Factors influencing the behavior of traveler

FACTORS	LOCAL TAXI	APP-BASED TAXI
PRICE CONSCIOUSNESS	1. I think the price of the local taxi service is appropriate 2. I think local taxi services are costly which is why I prefer app-based taxis	1. I think the price of the app-based taxi service is appropriate. 2. I think app-based taxis are costly which is why I prefer local taxi services
CONVENIENCE	1. Calling a taxi from the phone/ taxi stand / from the road is convenient for me 2. Since I can hire local taxis without a mobile app, hiring a taxi is more simple	1. Booking apps are convenient for me to travel/hire a taxi 2. Since I can use the mobile app, hiring a taxi is simple
GOVERNMENT SUPPORT	1. I think the Government should protect local taxis against app-based taxi services 2. I think new rules and regulations affect the local taxi service	1. I think the Government should protect app-based taxi services against local taxi services 2. I think new rules and regulations affect app-based taxi services
TRAVELERS PERCEPTION	1. I think the local taxi service is more Available 2. I think local taxi services are better than the app-based taxi service]	1. I think app-based taxi services are More Available 2. I think the app-based taxi services are better than the local taxi service
ATTITUDE	1. I assume that overall everyone should use a local taxi service only 2. I feel people are satisfied while taking the local taxi service. 3. I think people experience communication problems with local taxi drivers, such as miscommunication of language.	1. I assume that overall everyone should use app-based taxi services only 2. I feel people are satisfied when taking the app-based taxi service. 3. I think people experience communication problems with

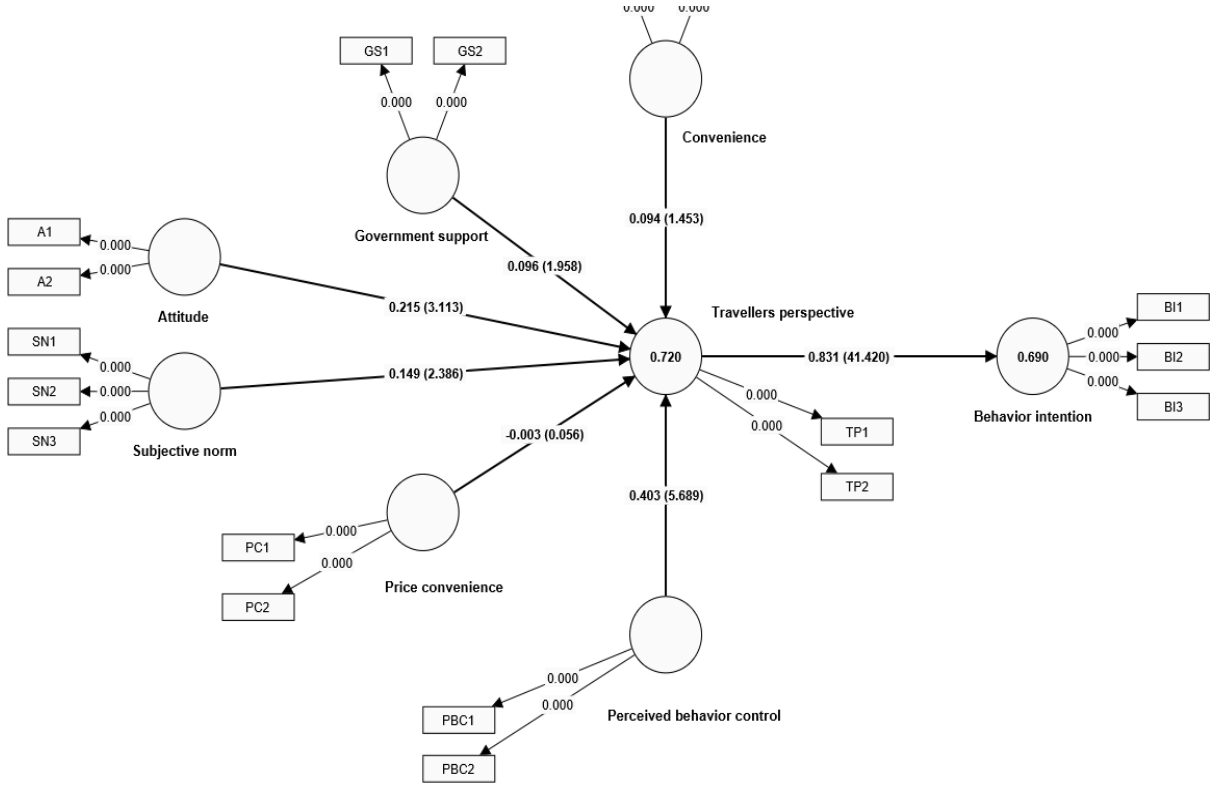
	4. The possibility of getting dumped by the local taxi service makes me feel unsafe	app-based taxi drivers, such as miscommunication of language. 4. The probability of a booked taxi being canceled makes me bothered
SUBJECTIVE NORMS	1. People whose opinions are valued by me would prefer that I should use a local taxi service 2. My friend / relative recommended me to use a local taxi service 3. My friends and family think local taxi services are better than the app-based taxi service	1. People whose opinions are valued by me would prefer that I should use an app-based taxi service 2. My friend / relative recommended me to use app-based taxi services 3. My friends and family think app-based taxi services are better than the local taxi service
PERCEIVED BEHAVIOURAL CONTROL	1. I think Local taxi services would be a reliable way to travel 2. It's easy for me to choose a local traditional taxi.	1. I think an App-based taxi service would be a reliable way to travel 2. It's easy for me to choose an app-based taxi service
BEHAVIOR INTENTION	1. I will say positive things about local taxi services and recommend local taxi services to others. 2. I feel it is safe to use the local taxi service 3. I'm used to taking a local taxi service	1. I will say positive things about app-based taxi services and recommend local taxi services to others. 2. I feel it is safe to use app-based taxi services 3. I'm used to taking app-based taxi services

Fig 1: Measurement model of offline taxi



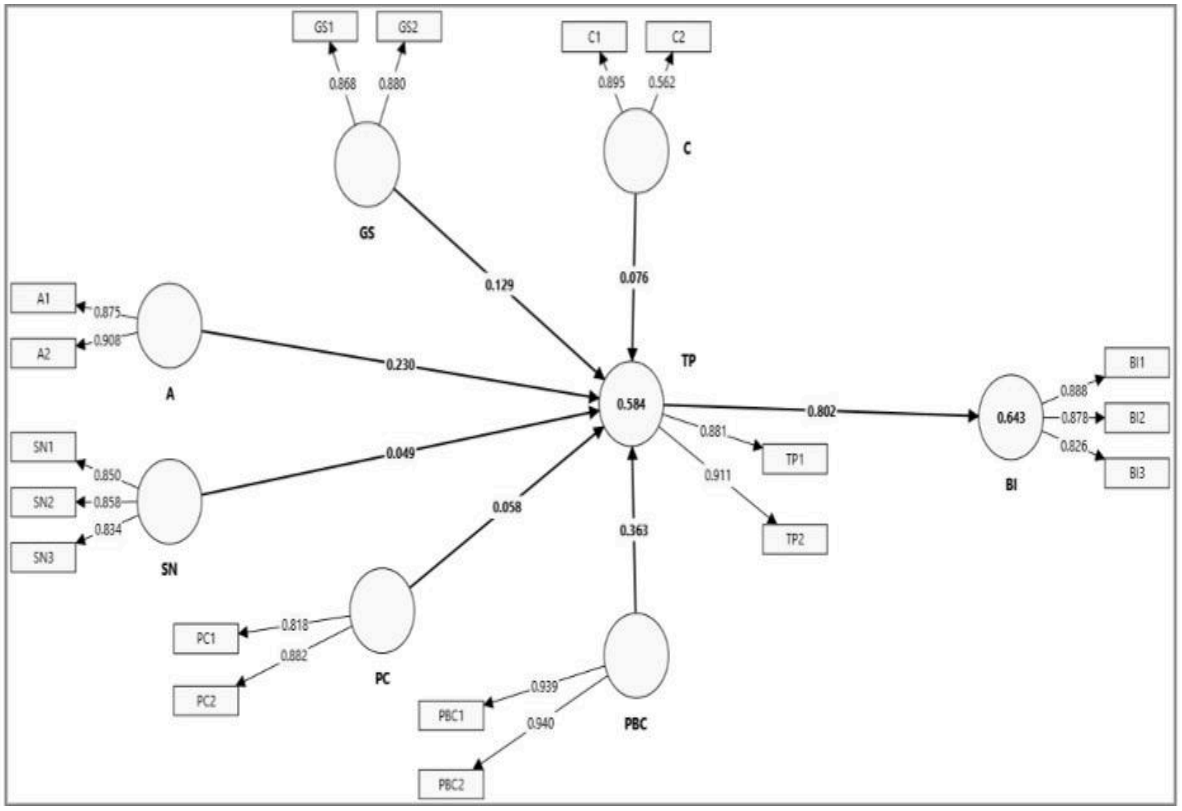
Source: the result of primary data analysis using SmartPLS

Fig 2: Structural model of offline taxi



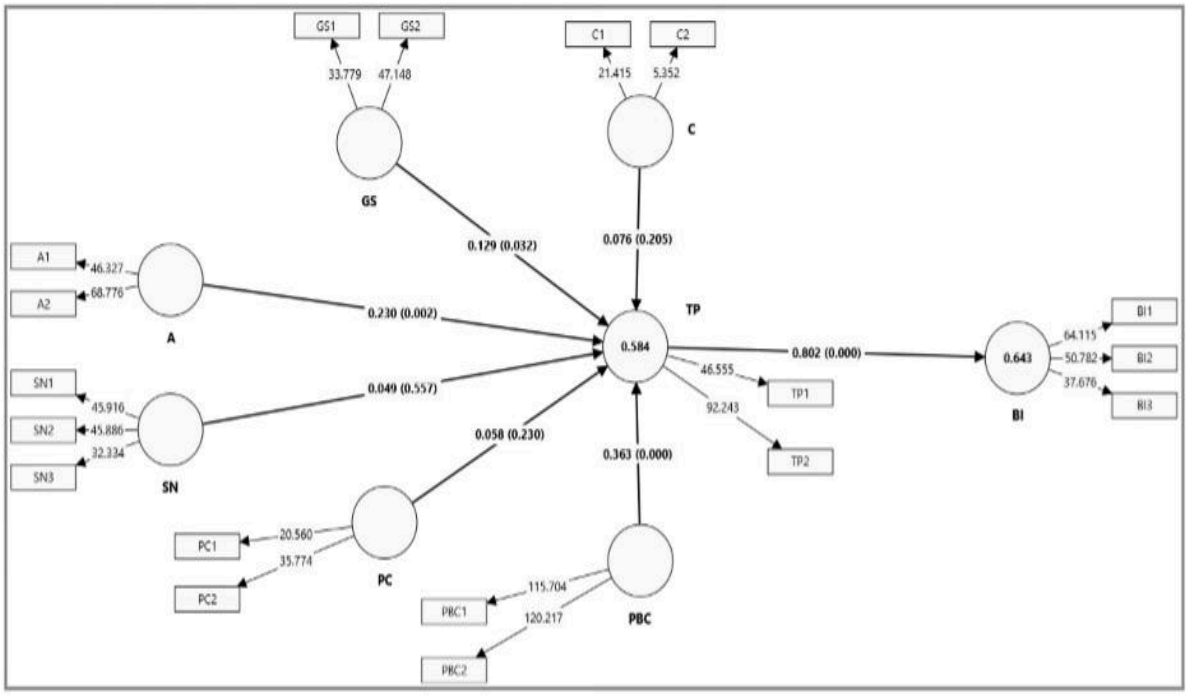
Source: the result of primary data analysis using SmartPLS

Fig 3: Measurement model of online taxi



Source: the result of primary data analysis using SmartPLS

Fig 4: Structural model of online taxi



Source: the result of primary data analysis using SmartPLS