Research for Factors Affecting the Purchasing Decision of Electric Vehicles (EVs)

Prepared by

Meilin QU ID: 1161808

Siqi LIU ID: 1161807

Prepared for COMM605 - Research for Managers

Lecturer: Paul Spence

22 September 2024

1. Discussion of Relevant Theories

Introduction

Between 2021 and 2022, the number of registered Tesla vehicles in New Zealand increased from 3,335 to 7,061. However, registrations fell to 4,994 in 2023, and from January to September 2024, Tesla delivered only 934 cars to end users, marking a significant decline. This downward trend poses a severe business challenge for Tesla. This study aims to identify the key factors to help Tesla develop effective market strategies, boost sales, and increase market share. This study will mainly be focusing on product quality, perceived value, environmental concerns, and charging infrastructure.

Research Purpose

By using the combining quantitative and qualitative approaches, the study serves both exploratory and explanatory purposes:

Exploratory: To discover the factors influencing consumer purchase decisions.

Explanatory: To explain the causal relationships between these factors and purchasing behavior.

Key Concepts and Theories

The Theory of Planned Behavior (TPB) can guide Tesla in understanding how attitudes, social norms, and perceived control (like charging infrastructure) impact consumer decisions. This helps managers focus on expanding infrastructure or targeting specific attitudes through marketing.

The Unified Theory of Acceptance and Use of Technology (UTAUT) provides insights into how

consumers perceive Tesla's technology and ease of use, allowing managers to prioritize technological innovations that meet customer expectations.

The Quality-based Behavioral Intention Model (QBIM) shows how perceived quality, value, and satisfaction drive purchase intentions, enabling Tesla to improve customer satisfaction or adjust pricing. For simplicity, the model will be referred to as QBIM throughout the rest of the report.

These theories together guide market research, shaping strategic decisions to improve sales and customer satisfaction.

Links with Research Design:

The introduction section sets the foundation for the entire research design by outlining the research question, objectives, and key variables. It provides a clear direction for the research methods used in subsequent sections, such as sampling, data collection (e.g., surveys and interviews), and analysis. The introduction's focus on factors influencing Tesla purchases directly informs the design of the questionnaire and interview questions, guiding the selection of participants and the choice of sampling techniques.

2. Interview Questions

Introduction

In this study, semi-structured interviews are employed as a primary method, which allow for a guided yet open-ended conversation, enabling participants to express their views freely while ensuring that key themes relevant to the research are thoroughly investigated. This method is particularly effective in explanatory studies aiming to understand the relationships between various factors influencing consumer decisions.

Each interview question serves a specific purpose to figure out the main factors influencing

New Zealand consumers' decision to purchase electric vehicles (EVs), particularly Tesla models.

Interview Questions

1. What do you value most when choosing a vehicle?
2. Tell me about your feeling on Tesla's product quality in comparison to competing electric vehicles?
3. How do you view the relationship between Tesla's additional features, technology, and performance and its higher price compared to other EVs?
4. To what extent do environmental concerns influence your decision to purchase an electric vehicle like Tesla?
5. How does the availability of charging infrastructure impact your decision to purchase or not purchase an electric vehicle?

Justification: of the Questions:

Question 1:

Linked Constructs: Perceived Value (QBIM), Attitude (TPB), Performance Expectancy (UTAUT)

Justification: Identifies key factors influencing consumer attitudes and expectations of EV performance, helping assess decision-making priorities.

Question 2:

Linked Constructs: Perceived Quality (QBIM), Attitude (TPB), Performance Expectancy (UTAUT)

Justification: Assesses consumer attitudes towards Tesla's quality and its effect on purchase intentions.

Question 3:

Linked Constructs: Perceived Value (QBIM), Performance Expectancy (UTAUT), Effort Expectancy (UTAUT)

Justification: Evaluates whether consumers perceive Tesla's added features as justifying its higher price.

Question 4:

Linked Constructs: Environmental Concerns (TPB), Attitude (TPB), Social Influence (UTAUT)

Justification: Explores the role of environmental concerns in shaping positive attitudes towards Tesla.

Question 5:

Linked Constructs: Perceived Behavioral Control (TPB), Facilitating Conditions (UTAUT), Perceived Value (QBIM)

Justification: Investigates how charging infrastructure influences the practicality and value perception of Tesla ownership.

Range of Predicted Responses:

Question 1:

- The initial price is a significant factor in my decision.
- I prioritize the overall design.
- I consider how well the car retains its value over time.
- I value vehicles that contribute to reducing environmental impact.

Question 2:

- Tesla offers superior build quality and reliability.
- Tesla's quality is like other EV brands.
- Some cheaper EVs provide better quality for the price.

Question 3:

- Leading technologies in Tesla are worth the higher cost.
- The additional features do not provide enough value to justify the higher cost.

Question 4:

- Environmental concerns are my primary motivation for wanting to purchase an EV: I choose EVs because I am committed to reducing my carbon footprint.
- I do not particularly think about the environment when I purchase a car: Environmental impact is not a major factor in my decision-making process.

Question 5:

- Without sufficient charging stations close by, I would not buy an EV.
- I will still buy an EV because I will put a power plug at home.
- I would like to support EV even if there is not enough charging infrastructures.

Selection Criteria of Interviewees

We selected purposive sampling, a non-probabilistic method, as it allows us to choose participants based on specific characteristics related to the research question.

Participants include Tesla owners, potential buyers, and those familiar with EVs.

In this study, we aim to understand the factors influencing Tesla's sales decline in New Zealand.

The goal is not to generalize to the larger population but to gain deep insights from individuals with direct experience or interest in Tesla EVs.

We aim for a diverse sample across demographics (age, gender, income), location (urban vs. rural), and EV experience (first-time vs. repeat buyers).

Estimation of Timeframe for the Entire Interview Process

1. Designing Questions: 1-2 weeks

   Brainstorming and refining clear, open-ended questions.

2. Recruiting Interviewees: 2-3 weeks

   Identifying participants who meet the selection criteria, obtaining consent, and scheduling.

3. Conducting the Interviews: 2-4 weeks

   The sample size is 15 participants, each interview will last 60-90 minutes.

4. Transcribing Interviews: 3-4 weeks

   Transcription estimated 60-75 hours, which needs 3-4 weeks of work.

5. Data Analysis: 4-6 weeks

   Coding, identifying themes, and interpreting the results.

6. Writing Up Findings: 2-3 weeks

   Summarizing key insights, drafting conclusions, and finalizing the report.

Total Estimated Time: 14-22 weeks

3. Questionnaire

Introduction

Survey questionnaires are ideal for gathering structured, quantifiable data from many respondents. For example, when researching why New Zealand consumers choose Tesla

electric vehicles (EVs), a questionnaire can systematically ask about factors such as product quality, perceived value, and environmental concerns. By using standardized, close-ended questions, all respondents interpret and answer the questions in a consistent way, which allows for easy comparison and analysis.

The following questionnaire is designed to collect quantitative data on the factors influencing New Zealand consumers' decisions to purchase Tesla electric vehicles (EVs). Each question focuses on a key variable that plays a role in the decision-making process, using closed-ended options to ensure responses can be easily analysed statistically.

Questionnaire Questions

Tesla EV Purchase Decision Survey

B *I* U 🔗 🗙

This survey aims to understand factors influencing consumer decisions to purchase Tesla electric vehicles (EVs) in New Zealand. Your responses will help explore key aspects such as product quality, price, environmental concerns, and charging infrastructure. Your answers are anonymous and will only be used for research purposes. Thank you for your participation!

What is your annual household income? *

○ Less than $50,000

○ $50,000 - $100,000

○ $100,000 - $150,000

○ More than $150,000

How concerned are you about the environmental impact of driving traditional gasoline vehicles?   *

○ Very concerned

○ Somewhat concerned

○ Not concerned

How important is the availability of public charging infrastructure if you were to consider purchasing an Electric Vehicle?   *

○ I won't but an electric car if there is not sufficient public charging infrastructures

○ I will still consider to buy an electric car if there are some public charging infrastructures

○ I will buy an electric car no matter how many charging infrastructure there are

○ Other...

How important are technological features (e.g., Autopilot, battery performance) in influencing your decision to buy an electric vehicle?   *

○ Very important

○ Somewhat important

○ Not important

How likely will you recommend a purchase of Tesla to others? *

○ Very likely

○ Somewhat likely

○ Not likely

Justification of the Questions

1. Investigative Question (Facts):

What is the income level of participants?

- **Variable:** Income level
- **Detail Measured:** Range of income (e.g., <$50,000, $50,000-$100,000, >$100,000)
- **Relation:** Understanding the income profile of both current and potential Tesla buyers can provide insights into the affordability of Tesla vehicles and its target demographic.

2. Investigative Question (Attitudes):

How concerned are individuals about the environmental impact of using electric vehicles compared to gasoline vehicles?

- **Variable:** Perceived environmental concern
- **Detail Measured:** Degree of concern (e.g., Very, somewhat, not concerned)
- **Relation:** Capture attitudes towards environmental concerns, which influence purchase intentions, aligning with the TPB.

3. Investigative Question (Attitudes):

How important is public charging infrastructures affect purchasing EVs?

- **Variable:** Attitude to the amount of charging stations
- **Detail Measured:** Importance scale (e.g., Very, somewhat, not important)
- **Relation:** How charging infrastructure impacts potential buyers' decisions.

4. Investigative Question (Attitudes):

How important are technological features (e.g., Autopilot, battery performance) in influencing the decision to purchase an electric vehicle?

- **Variable:** Importance of technological features
- **Detail Measured:** Importance scale (e.g., Very important, somewhat important, not important)
- **Relation:** This question assesses how Tesla's technological innovations affect consumer perceptions and decisions, drawing from the **UTAUT**.

5. Investigative Question (Behaviours):

How likely are individuals to recommend Tesla?

- **Variable:** Likelihood to recommend Tesla
- **Detail Measured:** Likelihood scale (e.g., Very, somewhat, not likely)
- **Relation:** Measures loyalty and **word-of-mouth behaviour**, which are strong indicators of overall satisfaction and perceived quality.

Selection Criteria of survey participants

The selection of participants for this survey is guided by the need to gather relevant data that addresses the research question on factors influencing the purchase of Tesla electric vehicles (EVs). Below are the key considerations and justifications for choosing the participants:

1. Target Audience: Tesla Owners, Potential Buyers, and Non-Owners Interested in EVs

   This will capture a comprehensive view of the factors influencing Tesla purchases.

2. Sampling Technique: Purposive Sampling (Non-Probability Sampling)

Purposive sampling is used to intentionally select participants who are most likely to provide meaningful insights. This approach is suitable for this study, as it allows for the deliberate selection of participants who have the most experience or interest in the topic.

3. Sample Size: Estimated 100-200 Participants

   This size allows for diversity in demographics and experiences while ensuring that the findings can be analyzed for trends and relationships.

4. Accessibility and Feasibility: Online Distribution

   The survey will be distributed online through email, social media, and EV forums to reach a wide and geographically dispersed audience. This method is cost-effective and allows for efficient data collection from relevant participants.

Selection Criteria of pilot study's participation

The participants chosen include **Tesla owners**, **potential EV buyers**, and **non-owners interested in electric vehicles**. This ensures that any issues identified during the pilot will be relevant to the actual respondents. By selecting participants with similar demographics, attitudes, and behaviors to the target group, the pilot can help refine the survey questions to better suit the final audience.

Sample Size for the Pilot Study (15 participants)

This small sample allows for thorough testing without overextending resources, ensuring that key issues can be detected and corrected before the full survey is launched.

Use of Convenience Sampling

For this pilot study, convenience sampling is appropriate due to the need for quick and easy access to participants who can provide immediate feedback. Participants can be drawn from online communities or EV forums, where individuals fitting the desired profile are easily accessible. This method is practical and cost-effective for testing purposes.

Estimation of Timeframe for the Entire Survey Process

1. Design and Post Interview Questions (1-2 weeks)
   Refine the questions to ensure they are concise, easy to understand, cohesive to each other and targeted to Tesla's research question.
2. Locating and Recruiting Participants (1 weeks)
   Using purposive sampling to target specific communities such as Tesla owners or EV enthusiasts through online forums, social media, or email lists. This process is short time by direct access to these groups via digital channels.
3. Administering the Survey (2 weeks)
   Given that the survey is online, it can be administered efficiently. Most participants will respond in one week. An additional week to follow-up reminders will help to achieving the desired response rate.
4. Data Collection and Cleaning (1 week)
   After the survey closes, data will need to be reviewed and cleaned by automated survey tools (e.g., removing incomplete responses, checking for outliers).
5. Data Analysis (2-3 weeks)
   Analysis phase includes statistical analysis (e.g., calculating frequencies, correlations, and any other relevant metrics) and interpreting the results. Using tools such as Excel or SPSS will help accelerate this process, but sufficient time is required to ensure thorough analysis and validation of results.

Total Estimated Time Frame (7-9weeks)

The total time frame for completing the survey process, including preparation, administering, and analysing the data, is estimated at 7 to 9 weeks. This allows for a smooth, efficient process that balances careful data collection and thorough analysis.