AP® Research Academic Paper

Sample Student Responses and Scoring Commentary

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Sample H

☑ **Scoring Guidelines**

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Academic Paper — 5 Points

Score of 1	Score of 2	Score of 3	Score of 4	Score of 5
Report on Existing Knowledge	**Report on Existing Knowledge with Simplistic Use of a Research Method**	**Ineffectual Argument for a New Understanding**	**Well-Supported, Articulate Argument Conveying a New Understanding**	**Rich Analysis of a New Understanding Addressing a Gap in the Research Base**
• Presents an overly broad topic of inquiry.	• Presents a topic of inquiry with narrowing scope or focus, that is NOT carried through either in the method or in the overall line of reasoning.	• Carries the focus or scope of a topic of inquiry through the method **AND** overall line of reasoning, even though the focus or scope might still be narrowing.	• Focuses a topic of inquiry with clear and narrow parameters, which are addressed through the method and the conclusion.	• Focuses a topic of inquiry with clear and narrow parameters, which are addressed through the method and the conclusion.
• Situates a topic of inquiry within a single perspective derived from scholarly works **OR** through a variety of perspectives derived from mostly non-scholarly works.	• Situates a topic of inquiry within a single perspective derived from scholarly works **OR** through a variety of perspectives derived from mostly non-scholarly works.	• Situates a topic of inquiry within relevant scholarly works of varying perspectives, although connections to some works may be unclear	• Explicitly connects a topic of inquiry to relevant scholarly works of varying perspectives **AND** logically explains how the topic of inquiry addresses a gap.	• Explicitly connects a topic of inquiry to relevant scholarly works of varying perspectives **AND** logically explains how the topic of inquiry addresses a gap.
• Describes a search and report process.	• Describes a nonreplicable research method **OR** provides an oversimplified description of a method, with questionable alignment to the purpose of the inquiry.	• Describes a reasonably replicable research method, with questionable alignment to the purpose of the inquiry.	• Logically defends the alignment of a detailed, replicable research method to the purpose of the inquiry	• Logically defends the alignment of a detailed, replicable research method to the purpose of the inquiry.
• Summarizes or reports existing knowledge in the field of understanding pertaining to the topic of inquiry.	• Summarizes or reports existing knowledge in the field of understanding pertaining to the topic of inquiry.	• Conveys a new understanding or conclusion, with an underdeveloped line of reasoning **OR** insufficient evidence.	• Supports a new understanding or conclusion through a logically organized line of reasoning **AND** sufficient evidence. The limitations and/or implications, if present, of the new understanding or conclusion are oversimplified.	• Justifies a new understanding or conclusion through a logical progression of inquiry choices, sufficient evidence, explanation of the limitations of the conclusion, and an explanation of the implications to the community of practice.
• Generally communicates the student's ideas, although errors in grammar, discipline-specific style, and organization distract or confuse the reader.	• Generally communicates the student's ideas, although errors in grammar, discipline-specific style, and organization distract or confuse the reader.	• Competently communicates the student's ideas, although there may be some errors in grammar, discipline-specific style, and organization.	• Competently communicates the student's ideas, although there may be some errors in grammar, discipline-specific style, and organization.	• Enhances the communication of the student's ideas through organization, use of design elements, conventions of grammar, style, mechanics, and word precision, with few to no errors.
• Cites **AND/OR** attributes sources (in bibliography/ works cited and/or intext), with multiple errors and/or an inconsistent use of a discipline specific style.	• Cites **AND/OR** attributes sources (in bibliography/ works cited and/or intext), with multiple errors and/or an inconsistent use of a discipline specific style.	• Cites **AND** attributes sources, using a discipline-specific style (in both bibliography/works cited **AND** intext), with few errors or inconsistencies.	• Cites **AND** attributes sources, with a consistent use of an appropriate discipline-specific style (in both bibliography/works cited **AND** intext), with few to no errors.	• Cites **AND** attributes sources, with a consistent use of an appropriate discipline-specific style (in both bibliography/works cited **AND** intext), with few to no errors.

Academic Paper

Overview

This performance task was intended to assess students' ability to conduct scholarly and responsible research and develop an evidence-based argument that clearly communicates a conclusion or new understanding stemming from a clearly articulated research question or project goal. More specifically, this performance task was intended to assess students' ability to:

- Generate a focused research question that is situated within or connected to a larger scholarly context or community;

- Explore relationships between and among multiple works representing multiple perspectives within the scholarly literature related to the topic of inquiry;

- Articulate what approach, method, or process they have chosen to use to address their research question, why they have chosen that approach to answering their question, and how they employed it;

- Develop and present their own argument, conclusion, or new understanding while acknowledging its limitations and discussing its implications to a larger community of practice;

- Support their conclusion through the compilation, use, and synthesis of relevant and significant evidence generated by their research;

- Use organizational and design elements to effectively convey the paper's message;

- Consistently and accurately cite, attribute, and integrate the knowledge and work of others, while distinguishing between the student's voice and that of others;

- Generate a paper in which word choice and syntax enhance communication by adhering to established conventions of grammar, usage, and mechanics.

Technological Advancements to Sustainability: Vehicles

Words: (4402)

Introduction:

The rising growth of EVs is a response to the growing environmental crisis, whose purpose is to reduce the greenhouse gas emissions which are gasses in the atmosphere that trap heat (national grid), and reliance on fossil fuels that creates air pollution from using non-renewable energy sources such as coal (europa.eu). Technological advancements in EVs in battery efficiency and sustainability are rapidly reshaping the automotive view. Additionally, the success of this technological revolution hinges not only on the advancements themselves but also on how they are communicated to and perceived by potential consumers. If the electric vehicles from car brands in America offer features that fulfills the consumers needs, consumers are more likely to adopt the electric vehicle lifestyle.

Since markets continuously change due to high sales from consumers purchasing vehicles because of the technological improvements, this research seeks for a method that would analyze the trends of markets and sales, mainly in America from 2010 - 2024. In this study, it will be based on other reliable sources that have data and synthesize the information to predict the future market trends in 2035. According to trend analysis, the more unique features inside the vehicle, such as having the ability to drive itself, will begin to attract more consumers into purchasing it. This research will grant information for manufacturers and markets as it provides insights into effective strategies for promoting EVs and understanding how to communicate technological advancements through marketing trends.

Literature Review

This study was influenced by a law that was recently proposed in 2022 that gained a lot of attention from state governments on the ban of gasoline cars. According to NBC Boston, by the year 2035, all cars sold in the state must run on electric or hydrogen. This means that states such as California and Massachusetts have passed the rules of banning the sales of new gas-powered cars by 2035 (NBC Boston). This means that the transition to electric vehicles will be a drastic change which will require adaptations once we reach the year 2035. People will have to start getting used to electric vehicles, so by having them understand the facts about it and learning more about the features, it will have a smooth transition to electric cars.

The focus on having electric cars is to mainly reduce the amount of greenhouse gasses, however there is one major issue that holds it back which is lithium-ion batteries. Lithium-ion batteries have many certain materials that contribute to the greenhouse effect such as Cobalt and Nickel. Nickel is an element mainly used for resisting corrosions, especially when it is red hot, making it suitable for inventions such as toasters, ovens, or batteries and Cobalt is an element that can be alloyed with other elements such as Nickel to make a powerful magnet (rsc.org). According to Ambrose, Hanjiro, and Jimmy O'Dea, the material Cobalt has gotten more expensive and there are negative impacts of mining it such as carbon dioxide. It had prediction data that by the year 2035, based on the year 2018 which was a 28% decrease to less than 15 which is around almost a 50% decrease (Ambrose, Hanjiro, and Jimmy O'Dea). This brings up a new sustainable opportunity

which is to begin developing recyclable lithium-ion batteries. This will help preserve the unnecessary mining to prevent any more gasses from entering our climate.

There is an alternative choice for a sustainable fuel car which is hydrogen. According to the Union of Concerned Scientists, the development of using hydrogen-powered fuel cell electric cars in the United States was introduced by Hyundai in June 2014. It uses low-carbon sources such as methane gas from landfills, and includes electricity to pressurize the hydrogen gas for dispensing to vehicles. One of the main issues is the process of creating carbon footprint due to the chemical element (UCS). Although this research will be mainly focused on EVs, this information was necessary as it is also one of the fuel sources that are acceptable for the upcoming 2035 law.

In order to appeal to consumers that question the use of electric vehicles, automotive industries like Tesla added a feature that inspired people to begin transitioning to EVs. The use of self-driving cars can be very beneficial as it encourages people to switch people from public transportation to private vehicles. According to Cohen, new mobility trends have been developed as autonomous vehicles have changed how the world thinks by being able to get people from Point A to point B within satisfactory time. If people begin to share AV, it can reduce the overall number of cars which means less interruption in traffic flow (Cohen). The introduction of self-driving features in EVs have created a rapid shift in market dynamics towards EVs.

The government has the power to promote electric vehicles by establishing federal policies that would give a reason for consumers on why they should purchase the vehicle. According to Nealer, she gives a suggestion to congress that they should enact a federal

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Renewable Electricity Standard, and encourage the strengthening of it in effective ways of decreasing global warming emissions. Another is that congress should protect the existing $7,500 federal tax credit because it will help decrease the current cost differences between EVs and comparable gasoline powered vehicles. Another policy of what Congress can also do is to fund programs and partnerships for more charging stations as there are rarely any convenient charging stations nearby which can be unfortunate for EV drivers (Nealer). By ensuring that EVs are powered by clean energy, the environmental benefits of EVs are maximized, making them more appealing to consumers. Especially with the $7,500 federal tax credit since this addresses the cost barrier associated with EVs.

This research intends on predicting the data values in market trends for the year 2035 by utilizing current data sources by using trend analysis methods to help not just understanding current trends but also forecasting future changes in market dynamics. The transition from using gasoline cars to being limited with only electric vehicles can have a rough change in future markets which is why automobile industries are beginning to adapt to EVs and giving them a unique quirk through technology innovation.

Method Section:

The first step in doing this research was to select the studies that already have data about the sales of EVs, the technology innovation, and the consumer trends in the year between

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2017 - 2023. The reason for the chosen dates is due to the rising trends of electric

vehicles in the year 2017. The vehicles that were chosen are Tesla Model X, Model 3,

Model, Volkswagen e-Golf, Nissan Leaf, and BMW i3. The website that was used for this

research is called BadCars.

Next, I used vehicle prices as a cost factor and analyzed factors affecting EV sales, like

battery efficiency. Tesla's long-range capabilities were notable, enhancing consumer

satisfaction. In order to figure out how we can have these electric vehicles to gain better

sales, there are various factors that can come into play such as the efficiency of the

battery, Tesla is well known for its long range capabilities, giving the satisfaction of

consumers to get from Point A to Point B for a very long time before its next charge.

Another study focused on factors influencing EV sales. I identified standard features

using filters on Edmunds, including owner opinion, performance, design, and technology.

By using the website called Edmunds, I filtered the reviews based on the consumer's

opinion. It will have the components such as the owner's opinion, performance, design

and build, and technology and features.

The first step was to identify the total sales of the selected vehicles. The third step in

doing this research is to examine 35 reviews of each vehicle that are chosen. Then

analyze each of the reviews based on their personal opinion which will include the pros

and some cons. I coded my data into separate categories that will also include the

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subcategories such as the user experience, maintenance.

The research process involved gathering data on EV range from various websites to address range anxiety. The second step in doing this research is to gather data from other websites that contains the total range of the electric vehicle. The reason for this is to address the range anxiety that limits people from purchasing an electric vehicle.

Trend analysis was preferred due to its effectiveness in handling large datasets. Trend analysis is chosen over other methods like quantitative, qualitative, and descriptive research due to its sustainability for analyzing large datasets and its effectiveness in identifying patterns over time. This method is ideal for synthesizing data from various sources, including consumer surveys, market reports, and impact from government policies, to provide a comprehensive view of trends in EV adoption and marketing strategies. If I used a quantitative method that may require a more controlled and structured data environment, it would make the purpose of the research invalid when this research is based on the prediction for 2035.

No equipment or permissions were required as the research utilized public data from sources like Google Scholar and Edmunds. For the question I am trying to answer "How do technological advancements and sustainable practices in EVs impact consumer adoption?", there isn't necessary equipment, or permissions needed to collect data as I have used public data online to evaluate my research. However, I needed to observe

multiple data from other research journals that are public and accessible in Google Scholar, JSTOR, or EBSCO. I will also be using a website called Edmunds to analyze the consumer's opinion. This research does not involve human subjects, so there will not be any surveys, interview questions, or other data gathering forms except using sources online that already have existing data for me to analyze.

Data collection included market trends, consumer preferences, and technology advancements in EVs, particularly in battery efficiency and recycling methods. I have gathered data on current market trends in EV adoption, focusing on consumer preferences, purchasing patterns, and the impact of marketing strategies on these trends. This will involve analyzing sales data, consumer surveys, and market forecasts. Not only that, I will document recent advancements in EV technology, mainly in battery efficiency, lifespan, and recycling methods.

Challenges included discrepancies in annual EV sales data across sources, requiring careful validation. There are multiple data sets from sources related to my research question that have each of the components needed for the research which is consumer behavior towards electric vehicles, technology improvements, and how policies impact on market trends for automotive industries. The challenges that occurred during my research is finding the exact number of electric vehicle sales annually. There were multiple sources that contain similar information with the annual sales in the U.S, however it shows a different number.

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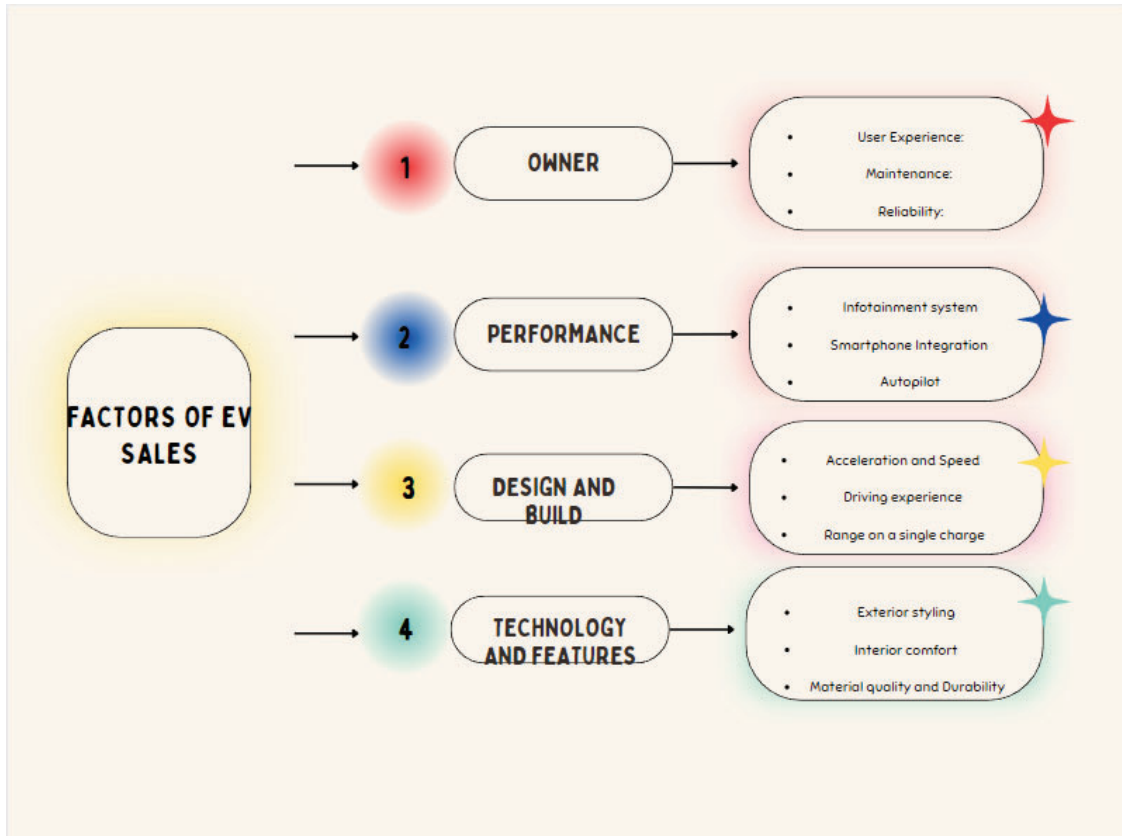
Research

Electric Cars	2017	2018	2019	2020	2021	2022	2023
Tesla Model X	21600	27250	19600	26100	7305	24099	17501
Tesla Model S	26800	29800	21000	18600	11555	176372	16000
Tesla Model 3	1667	140317	161100	206500	121,610	195698	173501
Chevrolet Bolt	23297	18020	16419	20753	24827	38122	62044
Nissan Leaf	11230	14715	12365	9559	14237	12026	7149
Volkswagen E-	3534	1354	4863	406	22	Discontinued	Discontinued
BMW i3	6276	6120	4853	1502	1476	Discontinued	Dicontinued

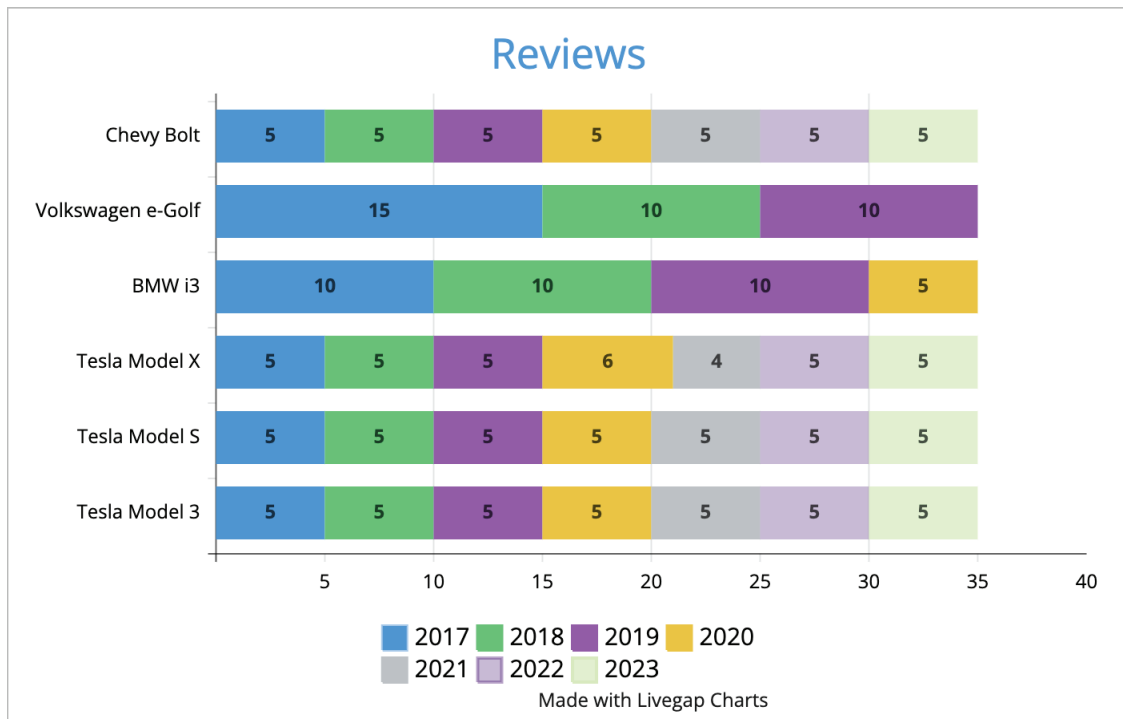Figure 1. (https://www.goodcarbadcar.net/)

After applying the chosen electric vehicles that are available in the U.S market, it shows

that Tesla is the most dominant electric car brand in the market with its Model 3. It

consistently has over 100k sales from 2018 - 2023. In 2017, there were only 2,400 Tesla

Model 3 created in the fourth quarter. Additionally, the Chevrolet Bolt had a big increase

in sales every year, peaking at 62044 in 2023.There are other car brands that created their

own EVs such as Volkswagen E-Golf and BMW i3, however they were soon to be

discontinued as they had lack of sales. However, these brands decided to focus on

creating an entirely different model such as the BMW i4 or ID.4. This leads to a question,

what factors influenced the sales of EVs. Then how these factors created a trend of

consumers purchasing EVs.

Electric Cars	2017	2018	2019	2020	2021	2022	2023
Tesla Model X	295 Miles	295 Miles	325 Miles	325 Miles	360 Miles	351 Miles	348 Miles
Tesla Model S	300 Miles	335 Miles	335 Miles	402 Miles	412 Miles	412 Miles	405 Miles
Tesla Model 3	310 Miles	310 Miles	310 Miles	322 Miles	353 Miles	358 Miles	358 Miles
Chevrolet Bolt	238 Miles	238 Miles	238 Miles	259 Miles	259 Miles	259 Miles	259 Miles
Nissan Leaf	107 MIles	107 Miles	226 Miles	226 Miles	226 Miles	226 MIles	215 Miles
Volkswagen E-	125 Miles	125 Miles	125 Miles	Discontinued	Discontinued	Discontinued	Discontinued
BMW i3	180 Miles	180 Miles	200 Miles	200 Miles	200 Miles	Discontinued	Discontinued

Figure 2. (https://www.caranddriver.com/)

One factor that could influence the sales of electric vehicles is the efficiency of the

battery that allows consumers to travel them from Point A to Point B. These different car

brands continue to make better and efficient batteries that increase the range of the

vehicles. I focus on vehicles that have a long range package such as Tesla Long Range

and Nissan Leaf SV Plus. There are three vehicles that had no significant improvement

on their battery life which are BMW i3,Volkswagen e-Golf, and Chevrolet Bolt. BMW i3

only had an increase of 10% in their range, Volkswagen e-Golf with an increase of 0%, and Chevrolet Bolt with an increase of approximately 8%. However Bolt offers more range than these vehicles by being able to go up to 258 miles. The vehicle that had significant improvements is the Nissan Leaf with approximately 53% going from 107 miles to 226 miles. Though, the battery efficiency decreased in 2023 with only 215 miles. Comparing each Tesla model, the Model X and Model 3 both have similar mile range but they have a difference in cost. The Model 3 offers most of the features, and has better range by a bit, which could be the influence of its sales of over 6 figures.

Reviews

Vehicle	2017	2018	2019	2020	2021	2022	2023
Chevy Bolt	5	5	5	5	5	5	5
Volkswagen e-Golf	15	10	10				
BMW i3	10	10	10	5			
Tesla Model X	5	5	5	6	4	5	5
Tesla Model S	5	5	5	5	5	5	5
Tesla Model 3	5	5	5	5	5	5	5

Made with Livegap Charts

As of February 25 2024, there were a total of 210 reviews that were chosen to be revealed based on the following electric vehicles chosen on a credible car website for information and reviews called Edmunds. Focused on mainly the most updated vehicles ranging from 2020-2023 as it is more likely to have the latest technology features. However, due to the stoppage of BMW i3 and Volkswagen in 2022, it will be formatted as 2019-2021 to collect more reviews. Then I picked out specific reviews that give well-depth information on their experience with the EVs they purchased. Also will have the Pros and Cons given by the website to support my analysis.

Owner's Opinions

For the Tesla Model 3, its pros come with excellent range, performance and handling, with comfortable seating and lots of interior room, and have access to Tesla's supercharger stations. However the cons is that it doesn't have smartphone integration and most of the features are on screen which can distract drivers. One reviewer that purchases the 2022 Tesla Model 3 long-range talks about their experience on the range of the vehicle:

"500 mile road trip with family of four great. Total cost, $16. Time at supercharger, 14 min from 30% to 95%. People complain about no car play/android auto, non issue. Tesla navigation is outstanding. Phone Bluetooth connects for calls. Connectivity lets you

connect to streaming services you subscribe to. Don't care about carplay/android auto

anymore, it's irrelevant."

Despite Tesla Model 3 not having smartphone integration, Tesla has their own solution to

make up for the lack of Android auto or Apple Carplay support such as the ability to have

bluetooth for calls, having streaming services, and integrated navigation system. With the

extended range from the package, it can reduce range anxiety and not have to worry

about dying quickly compared to other EVs. Also, the cost for electricity is low which

allows the owners to save a lot of money. Additionally, the charging speed is continuing

to increase over the years with Tesla's supercharging station.

For the Tesla Model S, its pros are excellent range, has one of the best acceleration, has

liftback design to increase cargo space, and have access to Tesla's supercharger stations.

Its cons are interior not being as good as other similarly priced sedans, no smartphone

integration, and limited color options. One owner purchase a base 2021 Tesla Model S

and talked about their experience with the vehicle:

"Much quieter and much less bumpy ride than the Model 3. It feels much more stable and

solid compared to the 3. While it does not have the refinement of the i5, its plenty good

enough and at $74,000, a relative bargain, and a good $20,000 less than a loaded i5

MX60, with at least 100 miles of extra range on a full charge and a very comparable ride

quality. The build quality, however, was so abysmal and the service even worse." When it

was delivered it had a whistling sound at speed".

Based on the review, we get a comparison between the Tesla Model 3 and other ICE

(Internal Combustion Engine) vehicles to see if there was any difference.

The Tesla Model S offers more range, and has similar ride quality to the BMW i5.

However, the issue with the new Tesla Model S is the build quality. While analyzing

multiple reviews, most mentioned about the gaps on the vehicle that appeared in the

exterior. The only upsides that got consumers satisfied was only the performance with the

top speed and acceleration.

For the Tesla Model X, the pros are acceleration, range, third-row seating, and access to

Tesla's supercharger. The cons are the rear doors functionality being finicky, windshield

letting too much sun and heat into cabin, and no smartphone integration. The owner of

the vehicle provided information on why they love their 2020 Tesla Model X:

"Biggest things to love:
- Acceleration
- Grounded - all weight underneath
- Free supercharging for life (roadtrip!?)
- All premium features including towing are now included no extra cost
- Real world range holds up (even in the cold once battery thermalizes)
- Infotainment (watching Netflix/Hulu/Youtube while charging with luxury speaker
surround)
- Constant updates and upgrades for no cost
- Most comfortable front seats I've ridden in on long drives"

This vehicle offers great performance, with premium features with no extra costs, and has
great battery efficiency. What makes Tesla different from other car brands is that they
offer software updates to their cars that will allow old models to be modern, making
consumers feel like it is new. However, basing off from the other reviews there were
issues with the features such as the summoning which doesn't work all the time.

Additionally, the build quality was also poor as there were gaps between the panel and body of the car.

All of these models do come with semi-automatic driving as standard and offers full self-driving ability with the additional charge of $12,000 with reviews , there were a mix of reviews with one talking about how excellent it was with detecting pedestrians in the upcoming street, and cars that is around them, but there were some that talked about how it was risky to use it on highways as it makes odd moves. One owner that purchased a 2018 Tesla Model 3 Long-Range, talked about their experience on how great autopilot is:

"This is the number one best reason to own a Tesla. One may scoff at spending $5K on what amounts to a software unlock, but it's money well spent. In its current iteration, AutoPilot is accurate and greatly reduces fatigue during stop-and-go traffic as well as long boring stretches of highway with minimal traffic."

Autopilot enhances the driving experience by reducing fatigue and stress during common driving scenarios such as stop-and-go traffic and long highway stretches with minimal traffic. This implies that consumers perceive Autopilot as a valuable tool for improving comfort and safety during their daily commute or long-distance travel. Not only that it may contribute to the overall road safety.

However, this owner had a different perspective on the autopilot. He owns a 2018 Tesla Model 3 Long Range who had an issue with the autopilot:

"The 'autopilot' puts you in very dangerous situations very regularly (hanging out in blind spots, changing lanes while needlessly braking in front of other cars, swerving for obstacles that don't exist and not swerving for obstacles that very much exist, etc.)"

The statement shows the safety concerns regarding Tesla's Autopilot feature which
highlights a unpredictable behavior with lingering in blind spots, making lane changes
with unnecessary braking, This issue shows the unreliability and unpredictability in
Autopilot's performance which will cause drivers to be more cautious to use the ability,
and can potentially increase the risk of accidents.

Given the following information, Tesla's autopilot feature can be the reason for the
consumer adoption by highlighting its potential benefits and addressing significant safety
and performance concerns. However, the feature seems to be still incomplete. As long as
Tesla continues to make updates to the self-driving ability, it will soon be a reliable
feature to have in future vehicles.

For the BMW i3, the pros are being lightweight which allows the vehicle to be quick,
with good interior, and offers range extender with gas. The cons are base price being
more expensive than rivals, cargo area being small and has a high load floor. This owner
purchased a 2017 BMW i3 with range extender and made an updated review in 2022:

*Have 104,400 miles on the car and I have had no problems yet. I did get the brake lines
drained and new fluid replaced as required every 5 years. I had to replace the front tires
and will soon need to replace the back tires maybe in about 6 more months or so.*

This demonstrates the reliability and performance of the BMW i3 after surpassing over
100,000 miles. This can positively impact its resale value and desirability in the used car

market. The cost of ownership seems manageable as there were no major issues on the vehicle. The only thing this owner had to do was replace the tires which is normal.

For the Volkswagen e-Golf, the pros are similar to other typical cars, premium interior materials, plenty of trunk space, comfortable, and quiet ride. For cons, it has a shorter electric range than other EVs and limited availability for this vehicle. This owner owns a 2017 Volkswagen e-Golf SE

"This car is a commuter car, it is not designed to do long journeys. We use it to commute into work every day, to run errands and for weekend fun around town. Think about it like a pair of comfortable everyday shoes: you can wear the same pair everyday, they are comfortable, they do their job, they are stylish, but you might not want to wear them for everything."

This statement shows from a different perspective of owning a vehicle that has low range as it can be used as a commuter car, rather than using it in long journeys. It is mainly used to drive to either work, run errands, and weekend activities around town. However, the owner also mentions that this vehicle should not be used for everything as the vehicle has its own limitations.

For Chevy Bolt, the pros is that it offers a spacious cabin, and the value for the vehicle is way worth it for its price. The cons are unable to charge fast, the cargo area is small, and the ride experience is not smooth. This owner used to own 25 different vehicles and purchased a 2023 Chevrolet Bolt 1LT:

"The ride is incredible. So quiet and smooth. I can compare the ride to my Escalade… Seems so much better to me than the completely bland Tesla interior with that massive, distracting screen."

This reviewer compared the driving experience of the Chevy Bolt to an Escalade that is known for its comfort and smoothness which shows that it is on par with high-end luxury SUVs. Additionally, he criticizes the interior of Tesla vehicles as it is bland and the giant touch screen is distracting. This perspective can be used as an example that some people may prefer traditional interior design with physical controls inside their EVs.

Conclusion

After using trend analysis on Edmunds, this study has examined various factors that contributed to the sales of electric vehicles. Not only this research conducted on the impact of technological advancements and sustainable practices in electric vehicles on

consumer adoption, it has led to a nuanced understanding of the current state of the EV
market and its future trajectory. Additionally, it addresses the gap on the future changes
on EVs that will make an impact on the market. The dominance of Tesla in the EV
market as it continues to make innovation in its battery technology, making it more
efficient in order to have more range in their vehicles. Also their vehicle performance
with how speedy it is with the acceleration, and how it can last long in one charge.
Finally, their access to supercharging reduces the amount of time of filling the entire
vehicle. Due to these factors, it increased the amount of consumer adoption in the EV
industry. This could be correlated to other electric vehicles on how some electric vehicles
such as the Volkswagen e-Golf and BMW i3 couldn't get much sales in America due to
the lack of range that could be only used to commute instead of going on road trips.
However, the implications of this market trend extend beyond consumer adoption,
highlighting the broader challenge of transitioning to sustainable transportation systems.
There are vehicles such as Chevy Bolt and Nissan that were able to meet the criteria of
the consumers which led to their continuation of sales. Chevy Bolt was able to offer over
200 miles worth of range which can be good for those who plan to use it to either
commute or go on long road trips. Also, the interior still offers buttons instead of Tesla's
minimalist design of having all the options to be on a screen. This will allow consumers
to still be used to the vehicle. The environmental benefits of EVs, coupled with
advancements in autonomous driving technology, promise a future of cleaner, safer, and
more efficient transportation. Yet, this potential is contingent upon addressing the current
limitations in technology, infrastructure, and regulatory frameworks. The limitation of
this research is the reliance on secondary data sources which includes sales figures and
consumer reviews. This may introduce biases or overlook critical factors influencing
consumer adoptions. Also, the rapid pace of technology development in the EV sector
means that findings can quickly become outdated, requiring more monitoring and
analysis. As EVs are starting to expand from multiple brands with the most up to date
features, you should start from the year 2020, instead of 2017 as that is the time when
electric vehicles have the most up to date technology. Tracking the evolution of consumer
attitudes and adoption patterns over time can help understand how technological
advancements and market dynamics influence consumer behavior. Research focusing on
battery technology, charging infrastructure, and renewable energy integration can address
some of the technical challenges limiting EV adoption.Studies assessing the broader
social and environmental impacts of transitioning to EVs, including changes in energy
consumption patterns, urban planning, and economic implications, are crucial for
understanding the holistic impact of EVs.

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sachusetts-in-2035/2818583/#:~:text=NBC%20Universal%2C%20Inc.,and%20Massachu

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Union of Concerned Scientists. How Clean Are Hydrogen Fuel Cell Electric Vehicles?:

New Hydrogen-Powered Cars Produce Substantially Less Global Warming

Emissions than Their Gasoline Counterparts. Union of Concerned Scientists, 2014.

JSTOR, http://www.jstor.org/stable/resrep17281. Accessed 4 Nov. 2023.

Academic Paper

Note: Student samples are quoted verbatim and may contain spelling and grammatical errors.

Sample: H
Score: 2

This paper earned a score of 2. Multiple research goals are presented. On page 2, "This research seeks for a method that would analyze the trends of markets and sales, mainly in America from 2010–2024," suggesting this paper may be creating a prediction model. On p. 5, the research goal is stated as, "This research intends on predicting the data values in market trends for the year 2035 … to help not just understanding current trends but also forecasting future changes in market dynamics." Another research question is found on p. 7, "How do technological advancements and sustainable practices in EVs impact consumer adoption?" On p. 10, the paper states, "This leads to a question, what factors influenced the sales of EVs. Then how these factors created a trend of consumers purchasing EVs." While related to electric vehicles, each question iteration has a slightly different goal and thus suggests a topic that is not carried throughout the overall line of reasoning and is still narrowing in focus.

The bibliography page shows four scholarly sources. Three scholarly sources are explored in the literature review along with the opinions of an advocacy group (Union of Concerned Scientists) and NBC news, but the sources are summarized like an annotated bibliography rather than synthesized to situate the topic of inquiry (pp. 2–4). Therefore, the literature review presents a single perspective rather than varying perspectives.

The paper outlines a systematic review with the first step to select studies that already have data from "research journals that are public and accessible in Google Scholar, JSTOR, or EBSCO", though the paper does indicate date range of 2017–2023 (pp. 6–7). The next step is to use "vehicle prices as a cost factor and analyzed factors affecting EV sales …" such as battery efficiency and owner's opinions (p. 7). While this is a description of a method, this is overly simplified as it leaves out critical details such as how to select studies, how to collect secondary data, how to analyze the secondary data, and how owner's opinions would be selected and analyzed to ascertain its impact on EV sales. The method is not reasonably replicable.

There is an attempt on pp. 10–11 to treat secondary data, drawing new conclusions from data collected; however, the treatment does not come from a described method. For example, "The vehicle that had significant improvements is the Nissan Leaf …" attempts to synthesize existing information, but the method does not explain how to do this. Some consumer reactions from Edmunds are provided on pp. 16–17, but how these comments were selected and how the comments should be synthesized to generate a new understanding is lacking in the method description. The method is oversimplified and not replicable. The conclusion presented on pp. 18–19 is a summary of existing information. The original goal was to create a prediction model for 2035 and forecast future changes, but the conclusion is not derived from either of the data charts nor analysis of the customer reviews.

The paper generally communicates the student's ideas (as opposed to competently communicating) with multiple citation errors, sloppy scholarship, and grammar errors throughout. The figures and charts presented do not have titles (pp. 10–11). On pp. 18–19, the line spacing changes from double spaced to single spaced.

This paper did not earn a score of 1 due to the narrowing focus of electric cars between a specific date range. There is an oversimplified method description on pp 6–9 with attempted use that reported existing knowledge.

This paper did not earn a score of 3 because the line of reasoning is not carried throughout. Furthermore, the topic is not situated in scholarly works, and the method is not reasonably replicable as key details for secondary data treatment are lacking. The communication is not competent, and the mechanics and citations of the paper are not consistent. While there is an attempt to defend some method choices and an asserted gap is noted on p. 18, the evidence suggests this paper does not cross into a score of 3.