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APPENDIX GA36d

LEVEL 7 ASSESSMENT SPECIFICATION

Student name:	**NG KWOK FAI**	**Student ID number:**	**1818883**
Programme:	**DBA**		
Module:	**Approaches to Research and Academic Communication**		
Module code:	**HKBM7000**	**Contribution to Overall Module Assessment (%):**	**40%**
Lecturer:	**Dr. Luk Chung Leung**	**Internal Verifier:**	
Assignment Title:	**In-class Presentation**	**Time Allowed:**	**15 minutes**
Submission deadline:	**18 July 2020**	**Return date of provisional marks & written feedback:**	**7 September 2020**
Submission method:			
Academic honesty / referencing:			

HKBM7000
Approaches to Research and Academic Communication

The Marketing and Challenging Issues of Electric Vehicles

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1. Research Problems and Objectives

1.1 Industry background

- Electric Vehicles
- powered by electricity from batteries
- less carbon emissions
- Types of electric vehicles
  - electric vehicle
  - hybrid electric vehicle
  - plug-in hybrid

1. Research Problems and Objectives

1.1 Industry background

- Global market turnover (Singh, 2020)
  - US$162.34 billion in 2019
  - expected to achieve US$802.81 billion by 2027

1. Research Problems and Objectives

1.1 Industry background

- Factors affecting market growth
  - manufacturing cost
  - maintenance cost
  - performance
  - infrastructure facilities
  - government regulations and subsidies
  - improvement of technology

1. Research Problems and Objectives

1.2 Definition of Problems

- low market share - electric cars represents only about 1% of cars sold in the USA (Mims, 2017)

- Major marketing problems and challenges
  - high cost
  - limitation in battery charging infrastructure
  - consumer attitude and behaviour (Theory of Planned Behavior)

1. Research Problems and Objectives

1.3 Research Objectives

What are the strengths and weaknesses of the electric vehicle industry?

What are the factors affecting the market growth of the electric vehicle industry?

2. Research Design

2.1 Definition of Variables

- age
- gender
- driving licence
- own a vehicle
- attitude and behaviour

2. Research Design

- Hypotheses testing
  - H1: There is positive relationship between consumers' attitude and their behavioral intention towards electric vehicles
  - H2: There is positive relationship between consumers' subjective norm and their behavioral intention towards electric vehicles
  - H3: There is a positive relationship between consumers' perceived behavioral control and their behavioral intention towards electric vehicles.
  - H4: There is positive relationship between consumers' environmental concern and their attitude towards electric vehicles.
  - H5: There is a positive relationship between consumers' environmental concern and their subjective norm

2. Research Design

- Hypotheses testing
  - H6: There is a positive relationship between consumers' environmental concern and their perceived behavioral control
  - H7: There is a positive relationship between consumers' environmental concern and the government policy
  - H8: There is a positive relationship between government policy and consumers' attitude towards electric vehicles
  - H9: There is a positive relationship between government policy and behavioral intention towards electric vehicles

2. Research Design

2.2 Framework of Relations

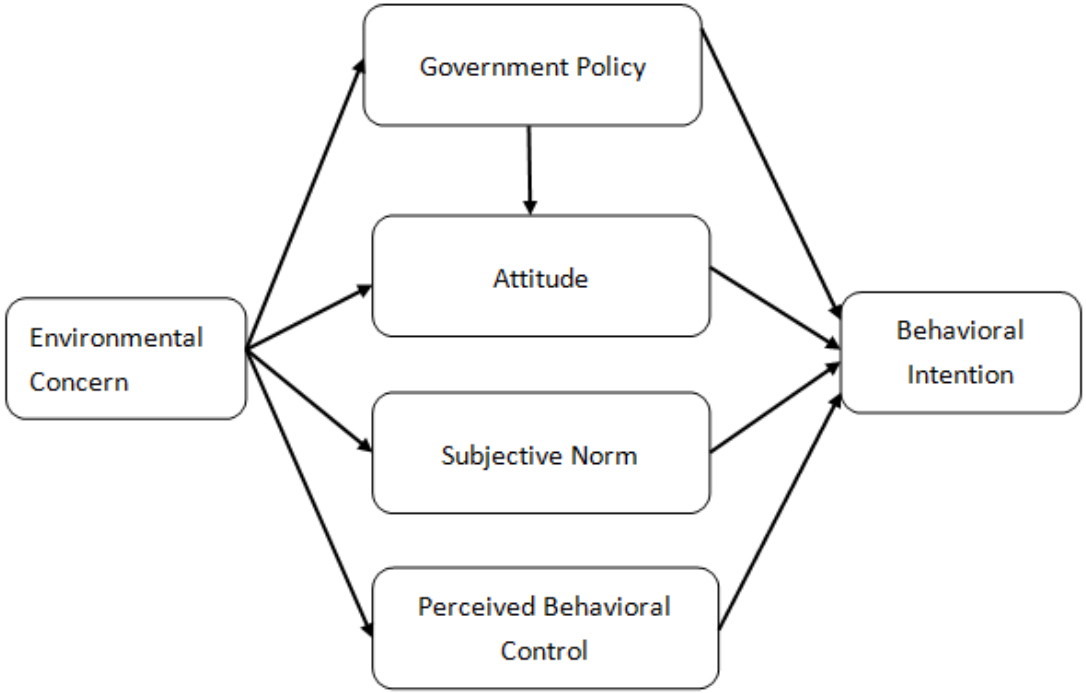

Figure 1: Conceptual Framework

2. Research Design

2.3 Research Method

- Quantitative Research Method
- measurement scales from previous studies
- two-sectioned questionnaire
  - general background of respondents
  - questions about the constructs (i.e. attitude, subjective norm, behavioral control, environmental concern, government policy)
- 5-point Likert-Type scale, from 1 (strongly agree) to 5 (strongly disagree)

2. Research Design

2.4 Sampling

- non-probability sampling
- online questionnaire survey
- target respondents aged between 18-70
- with driving licence

2. Research Design

2.5 Measures

- the construct measurements were adapted from previous studies and were validated
  - attitude
  - environmental concern
  - subject norms
  - behavioral control
  - government policy

3. Data Collection, Analyses and Report

3.1 Proposed Data Collection and Processing

- online questionnaire survey
- target group aged between 18 to 70 with driving licence
- mature
- certain driving experience
- in-depth feedback

3. Data Collection, Analyses and Report

3.2 Data Analyses to be Used

- SPSS
- reliability – Cronbach's alpha coefficient
- strength of association – Pearson correlation coefficient (for small sample size) or multiple regression (for large sample size)

3. Data Collection, Analyses and Report

3.3 Expected Findings and Recommendations

- the factors are correlated with consumers' intention towards electric vehicles
- affect the market growth of the electric vehicle industry
- proposed research to be done within a short period

3. Data Collection, Analyses and Report

3.4 Report and Organization

Week	Task
1	Literature Review
2-3	Set up Questionnaire
2-3	Data Collection & Analysis
4	Draft Report
4	Final Report

Reference

Achtnicht, M. (2012) 'German car buyers' willingness to pay to reduce CO2 emissions', *Climatic Change*, 113, pp. 679–697.

Ajzen, I. and Fishbein, M. (1980) *Understanding attitudes and predicting social behavior*. London: Prentice-Hall.

Ajzen, I. (1989) 'Attitude structure and behaviour' in Pratkanis, A.R., Breckler, S.J., Greenwald, A.G. (eds.) *Attitude Structure and Function*. USA: Erlbaum.

Axsen, J. and Kurani, K.S. (2013) 'Hybrid, plug-in hybrid, or electric- what do car buyers want? ', *Energy Policy*, 61, pp. 532-543.

Bamberg, S. (2003) 'How does environmental concern influence specific environmentally related behaviors? a new answer to an old question', *Journal of Environmental Psychology*, 23(1), pp. 21-32.

Electrification Coalition (2009) *Electrification Roadmap*. Washington, D.C. Retrieved from Http://www.electrificationcoalition.org/sites/default/files/SAF_1213_EC-Roadmap_v12_online.pdf

Gadenne, D., Sharma, B., Kerr, D., and Smith, T. (2011) 'The influence of consumers' environmental beliefs and attitudes on energy saving behaviors', *Energy Policy*, 39 (12), pp. 7684-7694.

Reference

Lai, I. K.W., Liu, Y., Sun, X., Zhang, H. and Xu, W. (2015) 'Factors influencing the behavioural intention towards full electric vehicles: an empirical study in Macau', *Sustainability*, 7(9), pp. 12564–12585. DOI:10.3390/su70912564

Kahn, M.E. (2007) 'Do greens drive hummers or hybrids? Environmental ideology as a determinant of consumer choice', *Journal of Environmental Economics and Management*, 54(2), pp. 129-145.

Mims, C. (2017) 'Electric-Car Problem: Too Few Chargers', *Wall Street Journal* 07 Aug 2017: B.1.

Moons, I. and Pelsmacker, P.D. (2015) 'An extended decomposed theory of planned behaviour to predict the usage intention of the electric car: a multi-group comparison', *Sustainability*, 7(5), pp. 6212–6245.

O'Garra, T., Mouratoa, S. and Peter, P. (2005) 'Analysing awareness and acceptability of hydrogen vehicles: a London case study', *International Journal of Hydrogen Energy*, 30, pp. 649-659.

Singh, A. (2020) 'Electric Vehicle Market by Type (Battery Electric Vehicles (BEV), Hybrid Electric Vehicles (HEV), and Plug-in Hybrid Electric Vehicles (PHEV)), Vehicle Class (Mid-Priced and Luxury), and Vehicle Type (Two-wheelers, Passenger Cars, and Commercial Vehicles): Global Opportunity Analysis and Industry Forecast, 2020-2027', *Allied Market* Research. Retrieved from https://www.alliedmarketresearch.com/electric-vehicle-market.

Reference

Todd, J., Chen, J. and Clogston, F. (2013) 'Creating the Clean Energy Economy: Analysis of the Electric Vehicle Industry', *International Economic Development Council.*

Wang, S., Fan, J., Zhao, D. and Yang, S. (2014) 'Predicting consumers' intention to adopt hybrid electric vehicles: using an extended version of the theory of planned behavior model', *Transportation*, 43(1), pp. 123–143.

Weigel, R.H. (1983) 'Environmental attitudes and the prediction of behavior' in Feimer, N.R., Geller, E.S., (Eds.) *Environmental Psychology: Directions and Perspectives*. USA: Praeger.

Yang, S., Zhang, D., Fu, J., Fan, S. and Ji, Y. (2018) 'Market cultivation of electric vehicles in China: a survey based on consumer behavior', *Sustainability*, 10(4056), pp. 1-23.

DOI:10.3390/su10114056

Zeithaml, V.A., Berry, L.L. and Parasuraman, A. (1996) 'The behavioral consequences of service quality', *Journal of Marketing*, 60, pp. 31-46.

Zhang, K., Guo, H., Yao, G. Li, C., Zhang, Y. and Wuhong, W. (2018) 'Modeling acceptance of electric vehicle sharing based on theory of planned behavior', *Sustainability*, 10(4686), pp. 1-14.

DOI:10.3390/su10124686

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