Comparative Research Project on User Perception and Acceptance of Autonomous Vehicles in UK & UAE

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Introduction

- The autonomous vehicle technological development is one of the most interesting topics for the public recently.

To define, autonomous vehicles are those in which operation of the vehicle occurs without direct driver input to control the steering, acceleration, and braking and are designed so that the driver is not expected to constantly monitor the roadway while operating in self-driving mode. In this context, it is important to understand that for a vehicle to qualify as fully autonomous, it should be able to navigate itself in real traffic within roads, which have not been specifically adapted for its use.

History of Autonomous Vehicles

- **1958** The first AV developed by the General Motors with capability of steering itself with wires embedded in the road.
- **1986** Research into autonomous vehicles begun.
- **1986** Robotics Institute of Carnegie Mellon University developed Nav-Lab and built one of the first autonomous vehicles that controlled by a computer.
- **2009** Google started first project to develop autonomous vehicles.
- **2012** Google's autonomous vehicle passes a 14-miles driving test in Nevada, USA.
- **2013** Mercedes and Infiniti produce cars with radar sensors and some autonomous driving features.
- **2016** NHTSA issues guidelines for testing and deployment of autonomous vehicles.

Companies investing in Autonomous Vehicles

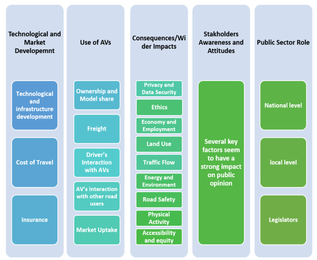
Today, Audi, Mercedes and Volvo are developing and testing new vehicles for future use. Even new players like Google and Apple have arrived on the scene.

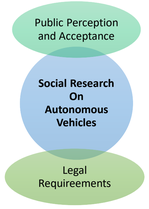
Research Questions/ Objectives

1. How might different public policy regimes shape the timely, safe adaptation and transition into AVs?
2. How to protect AVs users' privacy in the future, and ensure that the gathered information by AVs only use for operating the vehicle—and not for other purposes such as marketing without user's explicit consent?
3. What new policy recommendations on society?

- The knowledge gaps in this social research project address through following objectives to develop insight into public acceptance challenges associated with autonomous vehicle technology and increase knowledge of potential effects and requirements for the successful adaption of autonomous vehicles and legal requirements analysis:

Autonomous vehicles Themes

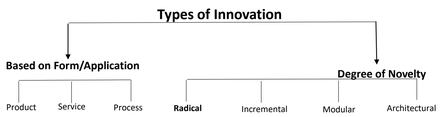




Public Perceptions and Acceptance: This is important to consider because understanding public views on willingness and how we travel in the future is derived from social researches. Understanding these views help to inform those who develop and plan this technology in the future on how we intend to travel.

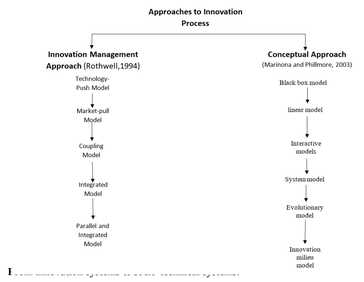
Legal Requirements
Research on Learning public acceptance and human factors can shape the future legal frameworks that has influence on autonomous vehicles data storing and collection.
The legal framework analysis of this research is to understand the legal factors for autonomous vehicles deployment and required future changes to legislation in order to facilitate the adaptation process of this AVs technology.

Theoretical Background



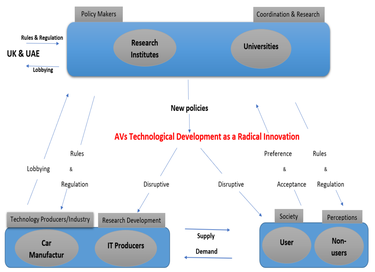
- One of the biggest business issues in today's world is to find a way that build a company where innovation is both systematic and radical.
- Radical innovation that introduces major new value propositions that disrupt the existing consumers' habits and behaviours.
- innovation is about introduction of something new to bring about major, radical changes.
- In this research the term innovation refers to context of development of new technology and interpret innovation as the creating something new that is significantly important to the relevant unit of adaptation.
- There are four types of innovations based on their effects on consumers habits and behaviours and their effects on the established firms' competences and complementary assets.
- Utterback (1975) argue that, Big companies are unlikely to create radical new markets for two reasons
- Based on the radical innovation the early pioneers tend to have the necessary technology and by definition enter the market much earlier than other firms.

- If an innovation meets two of the following conditions, then it is considered as radical innovation. First, if the innovation introduces major new value propositions that disrupt existing habits and behaviours of the consumers in the market. Second, if creates competences and complementary assets that existing competitors have built their successes.



- Their approaches on focus of analysis (Scope). Rothwell analysis the strategies of innovation activity of firm under different political and socio-economic situation rather than innovation models themselves. Hence the Rothwell model is for company level innovation management process analysis. On the other hand, Marinova & Phillimore's work is based on the models' analysis themselves with advantages / disadvantages and theoretical background of the model. In other word, Marinova & Phillimore's work is for whole economy.
- Socioeconomic status highly related to the innovation development process because a society has low income consumers and wealthy consumers. Socioeconomic status factors effect each stages of innovation development process.

Sociotechnical Approach for Analysis of Autonomous Vehicles in two National Contexts (UK & UAE)



- Utterback (1975) argues that, to understand how radical innovation come about, keep one thing in mind that, radical innovation is disruptive both for the consumers and producers.
- Radical innovations are disruptive. To manage disruptive innovation firm must be capable of recognising change in customer problems or market, and alter its strategy and behaviour accordingly, because customers problem is related to relatively broad social and market needs
- The perceived problems or needs of customers by broader sociotechnical factors are such as, user relations and market conditions, policy and regulation and industrial infrastructure.

- disruptive innovation is a process that introduces different set of performance, price and features attributes relative to the existing services and products in the market.
- Public willingness to accept the development of autonomous vehicles will determine how car manufacturers develop and market the autonomous vehicles. In terms of the policy and regulations the customers of autonomous vehicles will have privacy issues and problems that should be regulated through new policies and regulations.

Research Contribution

This research contributes to empirical literature by measuring the social acceptance primarily related to privacy in autonomous vehicles. Particularly the focus is on citizens, rather than consumers, because of its uniqueness.

Result

Public acceptability and public opinion has been widely discussed in the literature on AVs. It is clear that it has the potential to impact the technological development and the roll-out of AVs. Therefore, it is crucial to assess public perceptions regarding this new technological development. A number of institutions have undertaken surveys to assess public opinion.

Several key factors seem to have a strong impact on public opinion:

- Perceived usefulness and perceived benefits of AVs (e.g. travel time or congestion reduction) are likely to impact public opinion and acceptability of AVs.
- Public perception of AVs varies from one geographical area to another.
- Overall 60% of the participants in a survey that conducted in different cities around the world by the World Economic Forum are willing to travel by autonomous vehicles. Based on another survey, in emerging markets such as, United Arab Emirates, China and India acceptance of autonomous vehicles is high while in the UK and US is 50 per cent on the other hand, rates of acceptance of AVs in Germany and Japan is the lowest.

Development of AVs in UK & UAE

UK

1. In the UK in response of this fundamental technological development, the local and national level in the government begun to develop specific strategies in order to overcome or minimise the challenges of introduction of such vehicles.
2. UK government announced to support the testing and launching of autonomous vehicles by new policy development in 2013.
3. In 2015 the UK government showed green light for four cities into three different projects to launch the trials of autonomous vehicles. The aim of the government is to make UK as the global hub for the research and development of autonomous vehicles technologies. The following four cities have been chosen to offer funding.
   - **Greenwich, South East London (Gateway Project)**
   - **Milton Keynes and Coventry (UK Auto-Drive Project)**
   - **Bristol (Flourish Project)**

UAE

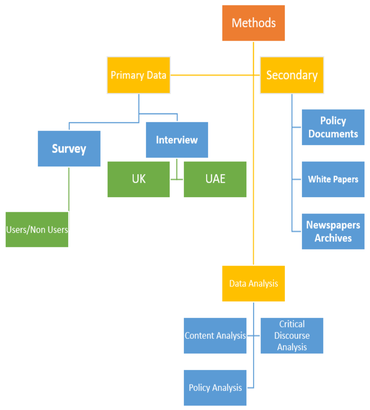
Finalists of Dubai World Challenge for Autonomous vehicles Transport

Organization/Company	Country
Navya	France
EasyMile	France
Drive.ai	US
Westfield	UK
Baidu	China
Sensible	Finland
Derq	UAE
Dubai University	UAE
UAE University	UAE
Al Ain University of Science and Technology	UAE
Abu Dhabi University	UAE
Frioe Berlin University	Germany
CMU	US
Intelligent Systems Lab at UC	Spain
UTS	Australia

This challenge is hosted by RTA to achieve objective of Dubai's Transportation Strategy which is transformation of 25 per cent of all trips in Dubai to autonomous vehicles by 2030. **The objectives in this challenge are five**:
First, to implement the vision of Dubai Transportation strategy.
Second, to allow participants and stakeholders in this challenge to showcase the advancements in the field of autonomous vehicles with global investors and partners.
Third, to make available the experiences and knowledge that achieves through this challenge to other global smart cities for better implementation of autonomous vehicles.
Fourth, to provide multi model transport options to support public transport.
Fifth, to encourage public awareness and policy development for autonomous vehicles in Dubai.

Methods

- Primarily, the objective is to use empirical research methods to measure the social acceptance of automated driving systems from the perspective of privacy.
- This is a qualitative & comparative research project that uses both Primary& Secondary sources of data.



Conclusion

- Comparative Project.
- to measure the social acceptance of automated driving systems from the perspective of privacy
- uses both Primary& Secondary sources of data.
- The ultimate objective of this research is to use social acceptance to contribute to socio-technical theory for Autonomous vehicles.
- Having insights in technical- and normative issues, this research will make recommendations for decision-makers both in the UK and UAE. Also, an actor analysis is conducted to explore their interrelations and direct recommendations to specific actors.

Why Public Perceptions and Acceptance? This is important to consider because understanding public views on willingness and how we travel in the future is derived from social researches. Understanding these views help to inform those who develop and plan this technology in the future on how we intend to travel.

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