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DIPLOMA THESIS

MASTER OF BUSINESS ADMINISTRATION

University of Economics and Management
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TITLE OF DIPLOMA THESIS
Attitudes Towards City e-Mobility Services

DATE OF GRADUATION AND DIPLOMA THESIS DEFENCE (MONTH/YEAR)
October/2018

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STUDENT'S DECLARATION
I declare that this Diploma thesis is my own work, and the bibliography contains all the literature that I have referred to in writing of the thesis. I am aware of the fact that this work will be published in accordance with the §47b of the Higher Education Act, and I agree with that publication, regardless of the result of the defended thesis. I declare that the information I used in the thesis come from legitimate sources, ie. in particular that it is not subject to state, professional or business secrets or other confidential sources, which I wouldn't have the rights to use or publish. Date and Place: **31/08/2018, Prague**

ACKNOWLEDGEMENT
I would first like to thank my thesis supervisor Doc. Ing. Zdeněk Linhart, CSc. from the University of Economics and Management [VSEM].

SUMMARY

1. Main objective:

The main objective is to help advertising readers of both Soft-Sell and Hard-Sell Ads on Smart-Mobility to improve ROI of investments into e-mobility and to find the general attitude of people on IoT.

2. Research methods:

Questionnaire will find countries with Inverse Preference of AG & AAG related to commuting.
Linkert Online Questionnaire on a seven-point scale was used to collect answers and Paired T-Test analysis to process AG and Aad differences between countries.
Total 171 people responded, out of which 90 Respondents for Soft-Sell Ad and 81 Respondents for the Hard-Sell Ad on Smart-Mobility.

3. Result of research:

For Soft-Sell Ad, AG has changed due to AAD, people are interested to accept Smart Mobility when advertised with social aspects, which they can feel and experience. Thus the Soft-Sell Ads are recommended for Smart-Mobility.
For Hard-Sell Ad, Ag has not changed due to AAD, complexities in the advertisement may confuse the people about the benefits Smart-Mobility brings to their lives.
The hypothesis stands false that the countries with very dense population with experience from blocked traffic will prefer public transport. Thus, it is recommended to promote the self-commute features in the countries with high density of population and public transport in the countries with low density.
The overall General Attitude towards IoT is Good, Favourable and Positive. Thus, promotion of the benefits of IoT with Smart Mobility is recommended.

4. Conclusions and recommendation:

The hard-sell advertisement had little to no impact on the attitude of people towards smart-mobility, soft-sell ad was able to affect and change the attitude of people towards smart-mobility. The change in AG reflects the effectivity of the soft-sell ad, and no change in AG in hard-sell ad shows the ineffectivity. The attitude in general towards the IoT devices was good, favourable and positive. So the investors (Transportation/Metro/Train manufacturers and the Automotive Manufacturers) in smart-mobility are recommended to utilize the soft-sell advertisement with the smart features IoT brings to the life of the people.
It was also found that the countries with dense population prefers to self-commute as opposed to the hypothesis. So the investors are recommended to promote their products related to self-commute in the countries which are densely populated.

KEYWORDS

AG, AAD, Smart Mobility, IoT, Attitude, Survey

JEL CLASSIFICATION

M37 Advertising, O35 Social Innovation, Q55Technological Innovation

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DIPLOMA THESIS ASSIGNMENT

Name and surname:	Prashant Nagle
Study program:	Master of Business Administration Eng (MBA)
Study group:	MBA EN03
Title of the thesis:	Attitudes Towards City e-Mobility Services
Content of the thesis:	1. Introduction – Problem Declaration, Aim, Methods, Structure of the Thesis 2. Theoretical-Methodological Part 2.1 Attitudes towards mass and individual transport, 2.1.1 Attitude towards IOT Devices 2.2 Taxation 2.3 Mediation of attitudes 2.4 Methodology 3. Analytical part 3.1 CPM characteristics 3.2 Answered hypotheses 3.3 Recommendations with BEP 4. Conclusions
References: (at least 4 sources)	• Bajada, T., Titheridge, H. The attitudes of tourists towards a bus service: implications for policy from a Maltese case study. *Transportation Research Procedia*, 25, 4110-4129, 2017. • Dianoux, C., Linhart, Z. The effectiveness of female nudity in advertising in three European countries. *International Marketing Review*, 27(5), 562-578, 2010. • Hoon, H., Scott, H. Introduction: Innovation and identity in next-generation smart cities. *City, Culture and Society*, 12, 1-4, 2018. • Sofana Reka, S., Dragicevic, T. Future effectual role of energy delivery: A comprehensive review of Internet of Things and smart grid. *Renewable and Sustainable Energy Reviews*, 91, 90-108, 2018.
Schedule:	• Aim and methods till: 05.05.2018 • Theoretical part till: do 01.06.2018 • Results till: 01.07.2018 • Final version till: 01.09.2018
Supervisor:	doc. Ing. Zdeněk Linhart, CSc.

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In Prague 01. 04. 2018

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1 Introduction

The cities in the different nations are facing a lot of challenges with regards to the commute and transportation (public and self-commute) of its citizens. There has been recent attempts of improvising the quality of transportation services with the introduction of City e-Mobility services or commonly known as Smart Mobility which is part of the Smart City services. Forbes lists top 10 Smart Cities in the world in 2018 namely, New York securing the smartest city in the world, London on second place, Paris on third, Tokyo (4), Reykjavik (5), Singapore (6), Seoul (7), Toronto (8), Hong Kong (9) and Amsterdam (10.). Europe, with 12 cities ranking among the top 25, is once again the top-performing geographical area. It is followed by North America, with six; Asia, with four (all in the top 10); and Oceania, with three. This was analysed considered key to being a smart, sustainable city: human capital (developing, attracting and nurturing talent), social cohesion (consensus among the different social groups in a city), economy, environment, governance, urban planning, international outreach, technology, and e-mobility and transportation (ease of movement and access to public services) (Forbes, 2018).

There is an active contemporary debate about how emerging technologies such as automated vehicles, peer-to-peer sharing applications and the ‘internet of things’ will revolutionise individual and mass mobility. Indeed, it is argued that the so-called ‘Smart Mobility’ transition, in which these technologies combine to transform how the mobility system is organised and operates, has already begun. The way people move within the city context changes with the development of transportation systems, information and communication technologies. In our project, we investigate new ways of urban mobility from both a cognitive and a transportation perspective.

Attitudes towards advertising in general were found to influence the effectiveness of specific ads. Attitudes towards advertising in general were expected to influence the success of any particular advertising. It seemed reasonable to anticipate a person's predisposition to respond consistently towards advertising in general, either favorably or unfavorably, would mediate the effectiveness of any given ad. Interest in the attitudes-towards-advertising-in-general construct gained momentum as researchers showed it was an important underlying determinant of attitude-towards-the-ad (Dianoux, C., Linhart, 2012).

This thesis examines based on international research the differences between results of studies focused on consumers’ attitude and their preferences towards advertising on Smart Mobility, general attitude towards IoT and to evaluate the reasons for such preferences.

The hypothesis is that the densly populated countries will prefer public transport. For example France will prefere public transport and Czech Republic will prefere private transport. And to find the reasons for such opposite preferences. For example, very densed population with experience from blocked traffic will prefer public transport. Then, it may be evaluated if this general opinion will be changed due to smart features of transport by displaying Soft-sell and Hard-sell ads. The abbreviations used for attitudes towards specific ads in general (ASG), attitudes toward advertising (Aad) and attitudes toward ads in general (AG).

An survey was carried out across several countries exposing consumers to the experimental advertisements on Smart Mobility with both Hard-Sell Ad, showing the technological and direct benefits and the Soft-Sell Ad, featuring the social aspects that comes with Smart Mobility.

The set of questionaire was created for each hard-sell and soft-sell ads in two parts, Part A and Part B. The three questions about attitude general are about institution of e-mobility (Smart Mobility). Therefore, the questions were asked to the respondents before and at the end of Part B questionnaire.

1. Overall, mobility is good
2. Overall, mobility is favourable
3. Overall, mobility is positive

These three questions were repeated in the end of B part of questionnaire to see if AG has changed due to Aad.

Two pictures of smart mobility were created. Each picture was shown to different group of respondents. Then the aim is to compare the assign differences in answers to the shown pictures.

This thesis is started with the theoretical background to clarify the key constructs of attitude toward advertising in general and attitude toward an ad, Smart Mobility as well as their relationship. The paper is focused on the specific area, where only mentioned surveys and researches can be deeply analyzed. Moreover the paper presents new factors which may influence resultant relationships observed by different authors all over the world. Thus, in light of our theoretical background and empirical evidence, the international context is presented the research questions were developed accordingly.

This thesis first introduces with the theoritical concepts of attitudes towards specific ads in general (ASG), attitudes toward advertising (Aad) and attitudes toward ads in general (AG), Smart Mobility, Internet of Things devices (IoT), Taxation Problems in select few countries towards the innovations, Mediation of Attitudes, CPM Characteristiscs, Answered Hypotheses and Recommendation with BEP.

2. Theoretical-Methodological Part

Attitudes toward an ad (Aad) can be define as thoughts and emotions of consumer related to the ad (Kirmani a Campbell, 2009). Other authors define Aad as emotional reaction of consumer (interesting/boring, symphatic/annoying etc.) (Lutz et al., 1983; MacKenzie, 1986). It is also possible to mention that there are another two aspects of ad perception – cognitive and emotional (Shimp, 1981). These attitudes can obtain also emotional reactions (luck, happiness etc.) and evaluation reaction (trustfulness or information bareness) (Baker a Lutz, 2000).

Lutz defines attitude towards the ad in general (AG) as thought predisposition of reaction (positive or negative) based on the shown advertisements.

2.1 Attitudes towards mass and individual transport

Starting with a theoretical background to clarify the key constructs of attitude toward advertising in general and attitude toward an ad, as well as their relationship and then about the Smart Mobility and the factors affecting commute.

Humans always needed to commute. To visit friends and family, to go to work, to do travel and leisure activities, to go shopping (Vilhelmson, 1999). Basically, to live our lives, to participate in society, we need to commute. It is next to impossible to do all activities on the very same spot, even such vital activities as sleeping and going to the toilet. Humans have throughout all time needed to travel, but more so in a contemporary society which is increasingly network-oriented (Castells, 2011), and seldom restricted to the local neighbourhood, village or fixated small-sized places. Nowadays, one person's network of family, friends, colleagues, workplace and so on may span entire cities, regions, countries, even across continents. As societies become increasingly network-oriented, the amount of mobility will tend to increase. Internet and communication technologies (ICT) has been suggested to replace or to reduce the need to travel, but that has, for the time being, not been the case (Banister, 2011; Hjorthol and Gripsrud, 2009). ICT has, arguably, on the contrary, enhanced mobility and resulted in increased mobility (Schwanen and Kwan, 2008; Dal Fiore et al., 2014). Constraints, such as not knowing how to get somewhere, or not knowing about the opportunities elsewhere and far-off, are easily reduced or eliminated by simply using a smartphone (Dal Fiore et al., 2014).

Mobility, the way it has been described so far, is understood as a derived demand in an activity approach (Vilhelmson, 1999). People do not commute for the sake of commuting in itself, but to participate in activities at locations elsewhere. Commuting is, in other words, the side effect of participating in society. This has been the usual conceptualising of travelling in transport disciplines, such as transport geography, throughout the years, but especially back in the golden age of spatial sciences (Cresswell, 2010). This paradigm can in many regards be considered as the cultural turn in social sciences finally catching up with the last 'positivist' stronghold, at least in human geography, namely transport studies (Røe, 2000).

Understandings of commute as a 'gift in itself' (Jain and Lyons, 2008) and as consisting of both physical movements, practices and representations embedded with cultural meaning (Cresswell, 2010), point out that how people practice, experience and perceive trips can have a major impact on how they travel. Albeit these elements are likely to influence what commute mode the commuters use and how much they commute, they are not included in this thesis. The use of quantitative interviews, surveys with questions about attitudes, cultural meaning and experiences, and technology fieldwork could have addressed these issues (Røe 2000).

e-Mobility will in this thesis be understood as a derived demand, and moreover, daily urban mobility is the form of mobility that is at the locus. Besides, in a sustainability perspective, the scope of city regions seems to be the most relevant for policymaking. While international climate change agreements have had a hard time to succeed, there appears to be a willingness at the level of cities, and city regions, to address climate change through actual measures (Banister, 2011). That mobility is more than just from A to B, commute in itself, experience, meaning, etc.

Several indicators can be applied to address commute behaviour, such as trip frequency, trip distances, transport mode choice, total distance travelled, and transport-related energy use. Total distance travelled by car and transport mode choice are chosen as indicators of commute choices in this master thesis. The commute choices also directly relatable to other important matters, such as congestion and local pollution. This indicator does not distinguish between how far and how often people commute but is deemed to be more relevant to policy-making. Commute mode choice is chosen because it does a good job of addressing the decision-making process specifically, which becomes even more important when it comes to decoupling population growth from growth in car use.

Daily e-mobility, or commute, is one of eight urban subsystems, or processes, that is identified in the urban system. The urban must, according to Wegener, be understood as an urban totality that is not static but ever changing due to fluctuations and modifications in these subsystems. The systems change, however, at different rates. The two subsystems physical networks – e-Mobility, communications and utility networks – and the overall land use change very slowly. The two following subsystems, workplaces and housing, change not as slowly as physical networks and the land use, but still slowly. The fifth and sixth subsystem, employment and population change fast, while (passenger) commute and goods transports can change immediately. A flow perspective (Dijst, 2013) that is inspired by Wegener's urban subsystems, also include the extremely fluctuate and ever-changing flows of information, knowledge and money. The flow perspective also includes large-scale natural processes in the Earth system, such as climate change, as a part of the urban system. In that sense, the urban transcends the scales of local and global.

All of these urban systems are linked together, and how the 'land-use transport feedback cycle' is used in planning literature to explain these relations. In short, the distribution of land use determines the locations of activities. Human activities need transport infrastructure – remember how a person is not able to do all activities at the very same spot. The transport infrastructures result in accessibility. The effects of uneven spatial distribution of accessibility results in relocations and real estate development in the most accessible areas. These changes in land use and location of activities will yet again result in new shifts in the transport infrastructure, and so on this feedback cycle continues. These relationships and the subsystems are market driven and subject to policy making.

Cities are heterogeneous with various types of districts, such as downtowns, central business districts, inner city areas, outer city areas, industry zones, and residential locations. The picture gets even more complicated as cities have turned into large heterogeneous city regions, with multiple regional centres, mini-cities (Røe and Saglie, 2011), in a polycentric pattern. The introduction of the car as the dominant transport mode allowed cities to sprawl, making the cities, and societies, arguably car-dependent. (Sub)urban sprawl has been a larger issue in the US than in Europe. One reason to this is that a large share of the expansion of European cities found place during the 19th century before the car was the dominant transport mode, while US cities expanded mostly after the second world war when the car was the dominating transport mode (Muller, 2004). Initial waves of residential relocations to the outskirts of cities, i.e. a suburban sprawl, have been followed by waves of relocating businesses, workplaces, and eventually shopping malls to the suburbs – turning cities inside out, rendering suburbs into postsuburban landscapes, and cities and countrysides into complex metropolitan areas (Garreau, 2011).

It is important to know how city structures, such as population density and proximity to the city centre influence the total distance travelled by car since it is directly relatable not only to the CO2 emissions from car use, but also other important aspects, such as congestion, local pollution and public health. Other aspects of travel behaviour, such as what transport mode people choose to travel with, must be used to delve into how trip destination locations influence travel behaviour. A common finding in quantitative land use/transport studies is that car ownership/access overshadows the influence of all other observable factors (Dieleman, Dijst, and Burghouwt, 2002), both socioeconomic and demographic attributes and urban structures, on travel behaviour. A major limitation in most of these studies is that car ownership is treated as independent from both urban structures and sociodemographic attributes of individuals and households, when these elements most likely are closely interlinked. It is usual in transport studies to distinguish between commute and non-commute trips. Utilitarian (commute) trips are assumed, and found (Vilhelmson, 1999), to be more governed by rational decision-making, and therefore more influenced by urban structures than non-commute trips.

To address another well-known issue in transport geography – both residential and travel-related self-selection – that people dwell in certain areas and have certain types of travel behaviour because they have different preferences (Cao, Mokhtarian, and Handy, 2009). Car ownership tracks back, arguably, to people's preferences of both city structures – they might have to use the car to live the place they want to live – and travel behaviour – they simply enjoy taking a ride with the car. Moreover, people may not prefer to dwell or travel the way they do, but they are selected into neighbourhoods that influence their car ownership and how they travel

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The five important Ds of Commute

There are two traditions on how to study the importance of the local neighbourhood for Commute behaviour. The first one, which is usual in American studies, is to examine the effect of the urban structures within the local neighbourhood on travel behaviour. The second tradition is to investigate the importance of the location of a neighbourhood relative to the city centre of the city or closest second-tier and regional centres.

Within the local neighbourhood, The 'three Ds' – density, diversity, and design – as the urban structures that influence travel behaviour the most (Cervero and Kockelman, 1997). Three other Ds, destination accessibility, distance to public transport, and demand management, have in later years been added to the list of influential urban structures. All of the Ds, except for demand management will subsequently be presented and used in this thesis. Demand management addresses mostly economic incentives to regulate supply and demand, such as parking supply, road pricing, etc, and is strictly speaking not a characteristic of the spatial urban structures.

1. Density

   Density has always been regarded as a key characteristic that influences travel behaviour, as shown in Newman and Kenworthy's well-known study. The density indicates the intensity of land use and activity within the neighbourhood. Previous studies have measured the effect of both population density, workplace density, and a combined population/workplace density. Workplace density is, however, labelled as an indicator of diversity in this thesis, however. The reason to this is explained in the following diversity section.

   Density in the local neighbourhood is important due to three reasons. First, higher density shortens distances between origins and destinations, which again is assumed to make people use non-motorized modes. The local density of each neighbourhood in the city adds up to the overall density of the city. In a city with overall high density, distances will be shorter than in a city with low density and equally large population. Second, high population density indicates a good market. Second, many people concentrated in a small is area is the same as many potential public transport users, customers, workers, and public service users. The expenses of constructing any infrastructure or service are lower per customer or user when they are concentrated and not dispersed. This supports a higher density of shops and services, thereby also contributing to mixed activities and workplaces in the local area. Concentrated flows of public transport passengers allow for higher frequencies, higher station density and an increasing competitiveness towards the car.

   Third, high density can simultaneously prove to be negative for car use since it contributes to bottlenecks and congestion, and fewer parking opportunities.

   In a meta-analysis of more than 50 quantitative studies, most of them American, Ewing and Cervero (2010) found that population density and workplace density only have a very weak effect on how much people travel. Increased density, of both kinds, is also associated with slightly increased shares of walking and public transport use. Increased residential population density reduces the distance travelled by car slightly. Ewing and Cervero suspect that high multicollinearity among urban structures in the quantitative models is the reason to the low contribution and that density, in reality, has a larger impact than predicted by the models. The idea is that the city structures are too interrelated. Instead of getting one clean and definite effect from one urban structure on commute behaviour, they muddle and render the effect of several urban structures to be weak or insignificant.

   The interwoven relationship between the distance from the residential location to the city centre and population density at the residential location. The population density at the residential location apparently does not contribute much in explaining commute behaviour. The local density of each neighbourhood in the city adds up to the overall density of the city. Moreover, in a city with overall high density, distances will be shorter than in a city with low density and equally large population.

2. Design

   Design addresses specifically the built environment in the local neighbourhood. Is it the street infrastructure designed in such a way that it promotes walking, or not? How pedestrian-oriented is the street design? Design was originally understood as the placement of parking lots and the placement of shade trees (Cervero and Kockelman 1997) but has over the years moved over to address the characteristics of street networks (Ewing and Cervero 2010). One major distinction has been whether the streets network in the local neighbourhood is cul-de-sac-oriented, with curvilinear roads, few intersections, and many dead-end streets – which are often found in suburban areas – or is the street network grid-oriented, just as in urban, central areas.

   Grid-oriented networks are assumed to offer direct routes in most directions, and promote walking, while cul-de-sac-shaped patterns discourage walking. A grid-shaped street network will not reduce car use on its own. Yes, grid-shaped streets reduce the cost of walking and cycling, but it also reduces the cost of using the car. Moreover, the reduced travel cost can result in a rebound effect, that people travel more because it is cheaper. To succeed in reducing car use, grid-shaped street networks must be combined with regulations and incentives, i.e. demand management, according to Crane. Intersection density has often been used as a design indicator, but also block size, street and pavement connectivity, and pavement coverage and metres have also been used.

   Most often intersection density – were found in the international meta-analysis (Ewing and Cervero, 2010) to have a larger, negative, impact on both density and diversity. Moreover, no other city structure had a larger impact on walking and public transport use than design. The association between design and travelling by car was insignificant when the distance from the place of residence to the city centre. The other study (Westford, 2010), from Stockholm, found that children are less likely to walk to the school in a neighbourhood with grid streets and mixed traffic than three other neighbourhoods with separate roads for active modes (walking, cycling) and motorised modes.

3. Diversity

   Diversity, refers to the variation and amount of activities in the local neighbourhood. A large range of diversity indicators have been used in previous studies, all from employment and floor area to different entropy measures with low values if the land use or activity in the local neighbourhood is monotone, and high values if the land use is diverse (Ewing and Cervero, 2010). Having an extensive range of facilities and services nearby, will assumedly reduce trip distances and thereby increase the likeliness of walking and cycling (Cervero and Kockelman, 1997). Diversity is also assumed to increase public transport use, albeit this association is not as obvious as the influence on cycling and walking. The assumption is that people are more inclined to use public transport if they can combine the trip with other activities, such as visiting the grocery store before/after they use public transport on the way to/from work.

   High degree of diversity, indicated by factors such as land use mix and job-housing balance, were found to have a positive effect on walking and public transport use in international studies (Ewing and Cervero, 2010). The reason assumed for it is an assumption among the researchers that local job opportunities are of little interest among most people in an increasingly specialised workforce. They work elsewhere anyway. Not only population density but also workplace density in the residential neighbourhood have a larger impact than proximity to the city centre on car use. Not an indicator of diversity in the location neighbourhood, however the accessibility to local service facilities reduced the distance people travelled by motorised modes and the energy use people spend on travelling.

4. Distance to public transport

   Increased distance to public transport makes it, assumedly, less likely to use public transport, while short distances make it more liable to use public transport (Ewing and Cervero, 2010). Moreover, the distance to public transport may not only have an impact on public transport use in itself but also what mode people use as access and egress modes on their way to and from public transport. People that dwell several kilometres from the public transport, but use it to commute to work in the city centre, for example, may be more likely to use the car to get to the public transport station than the person who lives next to the bus stop. People have in several contexts also been found to have a preference for rail-oriented public transport over bus-oriented public transport (Hensher, 2016).

   In international studies (Ewing and Cervero, 2010), proximity to public transport increased the shares of walking and, not surprisingly, public transport use. Public transport provision near the residence turned out to have some effect on total distance travelled by motorised mode, but no effect on the modal split. The distance to public transport had no significant effect on whether married men or women use the car or not to commute trips. What did matter, though, was the public transport frequency. This is a reminder that not only spatial configurations but also organisational configurations have an impact on how people travel.

5. Destination accessibility

   Destination accessibility addresses how easy people can get to their desired destinations. As previously mentioned, proximity to the concentration of facilities is more important than proximity to the single closest facility. Commute distance to the city centre, which has a high concentration of facilities, has often been used as an indicator of destination accessibility. Short distances are supposed to increase walkability, and cycling, while longer distances are more likely to increase the use of motorised transport modes, especially car use, and trip distances. Proximity to sub-centres has also been used as an indicator of destination accessibility and may be even more important to use to when one measures accessibility in studies of large polycentric city regions, with regional centres in the suburban areas, as well as in 'exurban' areas. These indicators address destination accessibility at a regional scale, and it is important to take them into consideration as the workforce get increasingly specialised. Besides, if people want to go the cinema or go out for dinner, or go shopping, then these kinds of leisure-oriented services also tend to be concentrated in central district. Distance to local centres, on the other hand, can be relevant when people are to carry out mundane everyday activities or have non-specialized work.

   Ewing and Cervero (2010) found in their meta-analysis that travel distance to the city centre is the most important city structure and public transport use, while also having a noteworthy effect on walking. People travel less by car and more by public transport and walking when they live nearby the city centre.

The overall trend is that people tend to travel more and longer by motorised transport modes the further they live away from the city centre. People travel longer by motorised modes the further they live from not only the city centre but also from local service facilities. People in the outer parts of the city region commuted in average longer and more often by car than city and inner city dwellers. Holden and Norland (2005) found that distance from residential location to the city centre had an effect on the respondents' everyday travel energy use, but the distance to local subcentre also had an impact.

Ewing and Cervero (2010) argue that distance to the city centre is a proxy for the other Ds that characterise the activities within the local neighbourhoods, and in that way also explain the low contribution of density to travel behaviour. It is the local within-neighbourhood Ds – density, diversity, design – that are proxies for the distance to the city centre of Oslo. It is more plausible, that the travel distance to the major concentrations of workplaces, services and facilities in the city centre matters more than the street design and the number of intersections in the residential neighbourhood.

Travel distances and car use increases outwards to these tipping points. Beyond these tipping points, people start to travel less. The assumption is that people live that far away from the assumedly most attractive concentrations of facilities, that they choose the second-best option within acceptable travel distance. The transport rationale of reducing transport costs outweighs the need of getting to the best facilities.

Access to recreational green areas has often been neglected in transport/land use studies, but green recreational areas, such as parks and forests, has proven in some studies (Holden and Norland, 2005) to have a significant effect on people's leisure, non-commute trips. One assumption is that people that dwell in dense and 'grey' inner-city areas compensate for the lack of nearby green leisure areas by carrying out longer leisure, non-commute trips, especially in the weekends.

Yet, inner-city dwellers seem to make medium-long leisure trips more often on the weekends, indicating a certain compensation effect.
Holden and Norland (2005) found that people in neighbourhoods with a high density of dwellings spend more energy on flights. They also found that residents with access to a private garden spend less transport-related energy on long leisure trips by car and plane. Holden and Norland (2005) stresses that the relationship between urban structures and especially long-distance leisure trips, such as flights, most likely is not causal, but rather spurious. A more plausible explanation, which needs further research, is that people with an urban and cosmopolitan lifestyle prefer to both live in urban areas and travel more by plane.

Strategies of sustainable City e-Mobility
In a compact city, the local neighbourhoods – and thereby the entire city – are densely populated, diverse and with pedestrian-oriented street design. In a dense city, distances to the city centre and subcentres will be short. Short walking distances to public transport also ensure a transit-oriented development. In that way, the compact development ensures that commute, in general, are shorter and therefore can be made by walking and cycling. The

transit-oriented development is intended to make it easier to undertake long-distance trips by public transport instead of using the car.

These strategies are also assumed to cause not only environmentally friendly mobility, but also socially equitable mobility (Cass, Shove, and Urry, 2005; Boschmann and Kwan, 2008). In an ideal compact transit-oriented city, people are not required to own a car. One issue that challenges this is that accessible locations equal to attractive and thereby expensive locations. That is why Banister (2001) suggests that policy-makers should emphasise a development of not only attractive but also affordable locations in the cities. Besides, the configurations of density, diversity and design in the compact city coincide particularly well with the configurations that will ensure livable streets full of activity – the 'sideway ballet' – in cities.

The challenge with the compact city strategy is that (sub)urban sprawl has resulted in large polycentric car-dependent city regions with long distances between functions. The influence of proximity to not only the main city centre but also regional sub-centres that the urban development should be decentralised at the regional scale, while development should be centralised and compact within the cities and neighbourhoods at the local scale.

In their solution to render car-dependent urban regions into sustainable configurations, so it could be strategise that basically a combination of the compact city strategy, and transit-oriented development. They envision that urban development should be dense and diverse around the transport hubs throughout the region, in so-called 'urban villages.', that are well-connected by the public transport infrastructure.

What is 'Smart Mobility'?

In order to begin the task of thinking through the implications of smart mobility that actors and institutions of governance will be confronted with, it is helpful to identify some key building blocks that are common to different views of the future as they are being debated today, especially those changes that are either already emerging or which are the subject of the most intense R&D effort, e.g.:

- The shift towards 'mobility as a service', where individuals' ownership of vehicles is increasingly replaced by "usership", that is the ability to purchase access rights to an interoperable package of mobility services (car, taxi, bus, rail, bike share) owned by others. This is facilitated by integrated aggregation and payment platforms, with intensive processing of 'big data' to match provision to demand in real time;
- Autonomous vehicles that do not require 'driving' by any of the passengers, and which enable all occupants of the vehicle to focus on other tasks whilst they are in motion; New user-generated and user-centred information which is context specific and integrates mobility and non-mobility options, which draws upon;
- Increasingly 'intelligent' infrastructure which derives operational information from users and provides feedback in real-time to influence of traveller behaviour and optimise system performance;
- The electrification of the vehicle fleet using battery power, plug-in hybrid and/or other new technologies. Combined with a smart energy distribution grid, electric vehicles could be both emission free at the point of use (thus satisfying consumer desire for 'sustainable' mobility, see Bakker et al, 2014) and also be part of the electricity storage solution for the widespread adoption of renewables more generally.

The list is not comprehensive of today's opportunities and new ideas will surely emerge. Nonetheless, some key elements of the socio-technical transition that appear in the more technology-led imaginings of smart mobility futures. First, there is the transition from ownership to "usership" identified as a critical innovation by advocates of smart mobility (Wocartz and Schartau, 2015). This transition is already apparent: car share clubs had almost 5 million members and 92,000 vehicles worldwide in 2014, an increase of more than ten fold over a decade previously (Le Vine et al, 2014). Given that the average car today is parked for 96% of the time there is very significant potential to unlock efficiencies by reducing the amount of time expensive assets are not actually mobile or under occupied.

Furthermore, apps such as Uber also work on the principle of better matching user demand and vehicle supply in space and time increasing the utilisation of drivers and reducing wait times for passengers. Combining these attributes provides the most optimistic (corporate) vision of the smart mobility future.

"*... if cars could drive themselves, there would be no need for most people to own them. A fleet of vehicles could operate as a personalized publictransportation system, picking people up and dropping them off independently, waiting at parking lots between calls. ... Streets would clear, highways shrink, parking lots turn to parkland."* (Bilger, B, 2013, Adams, J., 2015).

Second is a transition in the definition of the marketplace that is 'mobility'. Today this market is dominated by private vehicle ownership, roads funded by the state (usually through general taxation) and a public transport system which, to varying degrees in different places, has some form of state direction and support. The transition to a new smart model of mobility therefore implies that this traditional business model for the public private allocation of tasks across the mobility system will evolve. As one recent study into the market for intelligent mobility put it "*value in mobility is derived from traveller spend, whether this means spend on travel tickets, vehicle ownership, or services and apps*." (Wocartz and Schartau, 2015). Fundamentally, the commoditisation of individual journeys and the journey time of users is what makes 'smart mobility' pay for itself, and represents a continuation of the longstanding trend towards the neo-liberalisation of the transport system (Gössling and Cohen, 2014).

Whilst these innovations may also create public value for society and the state these are usually treated as secondary or residual impacts by the technology sector pushing the smart transition. More important for smart mobility proponents is the potential to grow the market by more effectively "*address(ing) significant unmet lifestyle needs across a range of traveller types*" (Wocartz and Schartau, 2015) thus neatly revealing the essential paradox of much smart mobility rhetoric at present, i.e. that the smart transition will simultaneously create the promise of a system that can reduce demand, whilst at the same time fulfilling previously unmet demand.

Third is the greater convenience and comprehensiveness of inter-modality or "*from the current 'modal-centric' to future 'user-centric' transport system"* identified as an important benefit of this more marketised approach to accessing mobility services (Yianni, 2015, Hietenan, 2014) sets out his view of future mobility as seeing "*the whole transport sector as a co-operative, interconnected eco-system, providing services reflecting the needs of customers. The boundaries between different transport modes are blurred or disappear completely. The ecosystem consists of transport infrastructure, transportation services, transport information* *and payment services."* Crucially, this transition requires the emergence of new integrated mobility aggregators, smart intermediaries that match mobility supply to demand in real time to tailor services to the needs of the travellers. The new role of aggregator, which iseffectively a form of arbitrage for mobility, is one if not the most important changeelements in the smart mobility system of the future. We return to the question of the implications of this role being played by the state or private firms below.

Fourth, there is a transition in the role of the citizen in the transport system. This is both as a source and recipient of information through mobile communication and through bringing their resources to the shared mobility platforms. This has so far manifested itself in people using their vehicles as part of ride-share systems, as vehicles on-demand for Uber and Lyft and by renting out driveways for other users. This is part of a wider transition away from the state as the prime source of information to being one of many actors feeding information into the mobility system.

2.1.1 Attitude towards IOT Devices

Although every technology expert has his own definition of the Internet of Things (IoT), they all believe that it will transform the world as we know it. The world has changed a lot since 1995, the year where the world wide web was introduced. The IoT is expected to make an even bigger impact on our lives. As was the same for the internet, it is important that we get a clear vision on what it is and how it can create value to our society. This technological revolution will connect everyone, everything, and everywhere. This makes it hard to define IoT, since everyone looks at it from his own point of view. Quality engineers could use IoT as a tool to monitor and improve their products, the government to build smart cities, others could use it to create ambient intelligence. These are only a few examples of the many opportunities that we are facing today. This thesis is also aim to guage the general attitude of people towards IoT.

Business Insider defines IoT as "*A network of internet-connected objects able to collect and exchange data using embedded sensors*" (Insider, 2016). IBM focuses on the virtualisation of real world objects, they see IoT as "*the creation of a digital twin of physical objects, it transforms the real physical world into a virtual world, where everything is connected*". These physical objects become objects with embedded electronics that can transfer data over a network without any human interaction (IBM, 2016). The guardian referes, just like Forbes, on the connectivity. They say it's about "*connecting devices over the internet, letting them talk to us, applications, and each other*" (The Guardian, 2016. IoT transforms physical items into smart items. Items that have the ability to capture context data and provide information systems with a representation of 'things'. They clearly focus on the information IoT generates. Cisco has a similar definition as Leiria. They also define IoT as a transformation of physical items into smart items. Cisco says IoT connects previously unconnected devices (Macaulay, Buckalew, & Chung, 2015). Some researchers stress the value of the information IoT generates. They describe it as a new information system which includes more objects than ever before. Gartner defines IoT as "*the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment.*" (Gartner, 2017). Another, more general definition is Internet of Things as the technology which is broadly used to refer to both: " *(i) the resulting global network interconnecting smart objects by means of extended Internet technologies, (ii) the set of supporting technologies necessary to realize such a vision (including, e.g., RFIDs, sensor/actuators, machine-to-machine communication devices, etc.) and (iii) the ensemble of* *applications and services leveraging such technologies to open new business and market opportunities*" (ITU, 2005). Most of these experts have similar definitions, only with a different focus. They agree that IoT is a network of interconnected physical objects that collect and exchange data. The main difference is the value delivery they expect that IoT will bring.

Traffic Management With the increasing congestions, more attention is been given to traffic management. It is important that there is an integrated system which manages traffic flows, parking spaces, emergency interventions, etc. Connecting the Traffic Management System with a GIS enabled digital road map of the city and using the power of data analytics is key to smoothen traffic management. IoT provides us with real time data which enables us to manage traffic flows much better. This real time data, combined with GIS mapping and parking management, provides information to the drivers which not only reduces congestions but also saves fuel and time. There are three ways to lower traffic congestion. The most obvious way is to lower traffic in general. A second would be to increase the capacity of the roads and infrastructure. The third is to optimise the traffic flows. All three of them can be implemented by using IoT. According to the United States department of Transportation, the majority of daily trips in the United States in 2001 occurred in personal vehicles, 87 percent in total. About 38 percent of all trips were personal vehicle trips without passengers besides the driver. This means that there is huge amount of lost capacity due to unused chairs. Internet of Things can enable app developers to create apps which allows people to use those free spaces. This combined with an improved public transport should be able to significantly reduce traffic.

There is a lot of traffic in the city centre by people who are looking to park their car. IoT can enable a sharing economy which can reduce the need for parking place significantly. Therefore, fewer cars are needed so it will be easier to park your car in the city centre. Complementary, IoT can increase capacity of the roads and infrastructure. Internet of Things enables us to measure the traffic flows. We can use this data to build a better/smoother road infrastructure. The same measurements can be used real time to divert traffic and solve traffic congestions real time. Following tables explain how this is done, these examples are suggested by Cisco. (Cisco, 2016)

Congestion

Number of Vehicles	▪ Sensors, connected to traffic signals, send information to a central server about the number of vehicles at a certain traffic signal
Data analysis	▪ Informations system gets real-time data from sensors about traffic signals within some distance of the specific junction
Inform about congestion	▪ When a threshold is reached, analytics software send a message to traffic displays 1km before the signal
Driver diverts	▪ When the number of vehicles at the signals decreases below threshold, message flashed on the displays stops urging drivers to drive towards signal
Integrated system	▪ Installing similar systems across the city makes all traffic signals congestion free

Table 1 Traffic Congestions Remedies (Cisco, 2016)

Traffic Emergency

Ambulance interventi on	▪ Ambulance carrying a critical patient is driving at full speed towards the hospital
Data analysis	▪ Information system gets real time data from sensors, traffic signals on the way to hospital and GIS mapping of all roads leading to hospital
Inform route to ambulance	▪ A message is sent to the ambulance display panel in front of the driver informing him which road to take
Manipulat e traffic	▪ All signals towards the hospital are asked to be manipulated, allowing the ambulance to pass through
Inform hospital	▪ A message is also sent to hospital system urging them to be ready, including an auto message to the doctor's phone to rush back if he is out

Table 2 Traffic Emergency (Cisco, 2016)

Criminal act prevention

Potential criminal activity	▪ Someone places a suspicious bag near a bus stop
Capturing data	▪ CCTV camera records all activities near bus stop
Data analysis	▪ All information from CCTV, sensors on the road, criminal database and information from police command center is analysed and decisions are being taken
Inform police and public	▪ Based on the analysis, a message is send to the police command centre and the nearest public display asking public to remain away from the site
Police Interventi on	▪ Police squad is dispatched to site to check bag contents and take necessary action
Inform about criminal	▪ Video of person placing bag is send across the police stations by the command centre

Table 3 Criminal act prevention (Cisco, 2016)

"*The increasingly invisible, dense and pervasive collection, processing and dissemination of data in the midst of people's private lives gives rise to serious privacy issues*" (Ziegeldorf, Morchon, & Wehrle, 2014). When IoT breaks through, data will be generated from objects that are private and personal to us. Our car will send data about where and how fast you are driving, your home will send data about the lighting and heating system, your fridge could tell what you eat or drink etc. Imagine what warehouses would do to get to this information. There hasn't been a good understanding about what privacy is and how we should control it.

Privacy in an Internet of Things environment (Ziegeldorf et al., 2014) implies that there is

- Awareness of privacy risks imposed by smart things and services surrounding the data subject
- Individual control over the collection and processing of personal information by the surrounding smart objects
- Awareness and control of subsequent use and distribution of personal information to anyone outside the subject's personal control sphere It is not clear what exactly personal information is since privacy is a social concept which is subjected to the individuals perception and believes.

Hence, we must take care about the sensitivity of the involved information and the relating user requirements when designing new systems and products. Lately, companies are taking PIAs (Privacy Impact Assessments) to see how their projects affect the stakeholders' privacy. (Roger Clarcke, 2009)

Interoperability

An another big challenge of IoT is the interoperability. Interoperability is necessary for using IoT at its full capacities. Applications can't be built anymore like they were used to, as standalone systems. Companies will have to work together to create applications that can work with each other, share data etc. It is the interoperability that is the real value of IoT. Data will be used by different applications and industries which opens a lot of opportunities. Since interoperability is crucial to the value delivery of IoT, it is important that we pay attention to this challenge. This comprises data sharing and thus standardisation as well as being able to process big data

Standardisation is necessary to guarantee the interoperability of several objects. Since the data will be used by other instances, clear definitions on how data should be created and processed must be made. When data has to be standardised, it sets a framework which restricts or makes it harder to make innovative and creative applications. Nonetheless, it is important to facilitate the interoperability. Many experts believe that most of the value will be delivered by the ***sharing*** of data. Some data will even be shared across different industries. Although the links between these cross functional areas are not clear right now, in the future they will be prominent in the value chain. Currently, the government is debating about how data should be managed. They are debating about the difference between data ownership and data usage and how to enable sharing of private data. A solution for this threat can be to implement an open API. This enables programmers to write their program as they wish. They are only constrained to the library for more abstract tasks. For example, a word processor doesn't need to know how exactly to operate a printer. The only thing it needs to be able to do is call for a specific part in the programming library. IIt allows the programmer to use features without understanding how these features work. In other words, it creates some form of abstraction. (Gubbi, Buyya, & Marusic, 2013).

The IoT Explosion

The number of online capable devices increased to 8.4 billion in 2017, and it is estimated that it will consist of about 30 billion objects by 2020. These devices include physical items, vehicles, home appliances and other objects that are embedded with electronics, software, sensors, actuators, and characterized by its connectivity to internet. Internet of Things (IoT) is a network of such devices through which they can exchange data and command. In the context of smart grid, IoT is at the pinnacle of its expansion stage as it offers a promising future with smart analytics. Energy based analytics data provided from the user to utility could potentially significantly enhance the efficiency and reduce congestions in the smart grid, thus contributing to the improvement power supply reliability in the future 100% renewable energy scenario. Globally, the path of a smart grid offers far reaching parallels in the evolution to smart cities and progress towards IoT. Information and communications technologies has transformed user's lives dramatically in all ventures since the past decade where the utility providers face a diverse challenge in achieving better customer relationships.

The prospects of IoT and IoT enabled applications are limitless with the possibilities of virtually connecting all the providers to the consumers and where communication is more prompt. This complete interface and interconnectivity eases the processes improving the productivity on a larger scale. The interconnectivity through communication such as mobile phones is possible with swift decision- making through social collaboration comprising IoT reducing application TCO (Total cost of ownership). There are many benefits of the cloud at the financial outlook that becomes apparent where the TCO of a particular solution is met from its purchase, considering the outcomes of both the service and operating expenses. Most companies put little effort to solely improve the errors and promptly offers service to an application on a complete cycle. In contrary, when the companies for their requirements, get a workplace software from the cloud, there is a possibility of obtaining these services at a fixed price for the entire contract period without due consideration of any hidden costs.

The part of this thesis was also to understand the Attitude in General towards IoT, so the set of questionnaire were created on the 7-point scale with 1 Surely disagree / 7 Surely agree and the opinions were taken.

Scale

1. Surely disagree
2. Middle disagreement
3. Slightly disagree
4. Neither agree nor disagree
5. Slightly agree
6. Middle agreement
7. Surely agree

Questions

a. Confidentiality can be managed with stringent laws
b. IoT needs better government regulating laws
c. Interoperability of IoT Devices & Apps from the different suppliers is a huge challenge
d. It is easy to connect things together, but much harder to decide what data should be allowed to read
e. IoT adversely affects the employment rate
f. Better services to the citizens is more important than the confidentiality of data
g. IoT makes us vulnerable to cyber attacks

The three questions about attitude general (Muehling, 1987) are about institution of IoT. Therefore, the questions were;

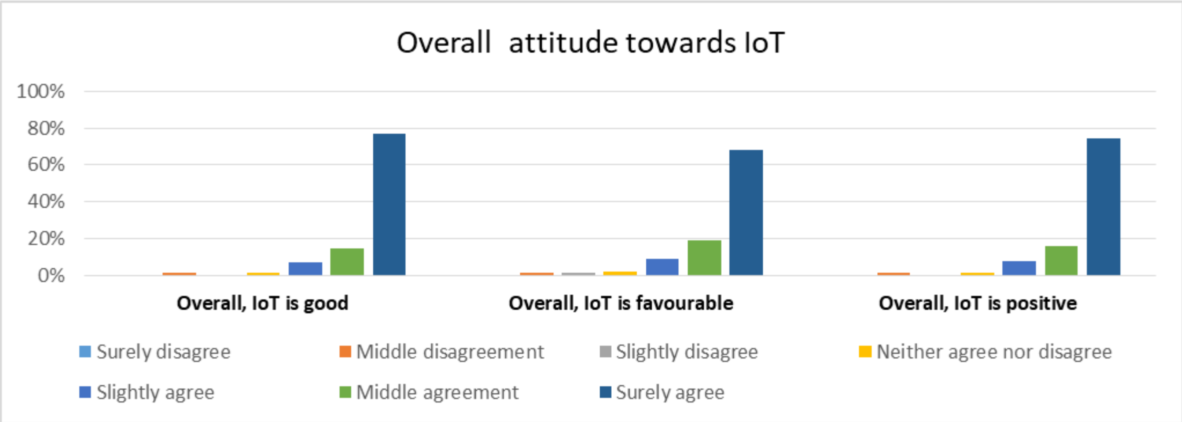
1. Overall, IoT is good
2. Overall, IoT is favourable
3. Overall, Smart mobility is positive

The responses to IoT questions from the Soft-Sell Ad are as below

Questions	**Surely disagree**	**Middle disagreement**	**Slightly disagree**	**Neither agree nor disagree**	**Slightly agree**	**Middle agreement**	**Surely agree**
IoT needs better government regulating laws	0%	1%	3%	1%	17%	21%	57%
IoT makes us vulnerable to cyber attacks	1%	0%	6%	8%	20%	22%	43%

It is easy to connect things together, but much harder to decide what data should be allowed to read	0%	3%	4%	6%	14%	28%	44%
Better services to the citizens is more important than the confidentiality of data	1%	0%	11%	2%	14%	24%	47%
Confidentiality can be managed with stringent laws	12%	8%	1%	6%	4%	14%	54%
IoT adversely affects the employment rate	11%	14%	3%	6%	14%	14%	37%
Interoperability of IoT Devices & Apps from the different suppliers is a huge challenge	0%	0%	2%	8%	22%	28%	40%
Overall, IoT is good	0%	1%	0%	1%	**7%**	**14%**	**77%**
Overall, IoT is favorable	0%	1%	1%	2%	**9%**	**19%**	**68%**
Overall, IoT is positive	0%	1%	0%	1%	**8%**	**16%**	**74%**

Table 4 Responses for IoT questionnaire



Picture 1 Graph generated from the responses of the respondents for IoT questionnaire

Conclusion: The overall General Attitude towards IoT is Good, Favourable and Positive.

2.2 Taxation

In the standard theory of tax evasion, individuals and corporations pay taxes only because they are forced to (i.e., because they believe that if they did not, they would be liable to prosecution by the state). If this were the case, it would be essential that the probability of being discovered for tax evasion, and the size of the penalty if caught and convicted are sufficiently large to deter evasion. One problem with the standard view isthat forsome taxes such as self-reported income taxes, it is hard to believe that the probability of being caught for evasion is very large. In fact, all countries do encounter tax evasion, even those with the most sophisticated systems for gaining compliance. To illustrate, the United States Internal Revenue Service estimates that the proportion of all individual tax returns that are audited was 0.8% in 1990 (down from 4.75% in 1965). Civil penaltiesrange from 20% of the portion of the underpayment resulting from a specific misconduct such as negligence or substantial understatement to 75% if there is evidence of substantial intentional wrongdoing. In very serious cases, criminal penalties may be applied. However, in 1995, only 4.1% of all U.S. taxpayers who were reassessed following an audit received any penalty at all. Yet, the IRS estimatesthat, for tax year 1992, 91.7% of income thatshould have been reported wasin fact reported

The standard view of tax compliance in tax theory is that taxes are a ‘burden’ or windfall harm. Individuals do not consider taxesin relation to the otherside of the government ledger - expenditures. The chief problem in normative taxation theory is to devise taxes which minimize the ‘excess burden’ , i.e, how to minimize the total burden of taxation. Asis now common in the literature on tax evasion, the model visualizes an individual taxpayer facing a tax rate t on own income Y. If she chooses to evade taxes, she faces a punishment ftE where E is the amount of unreported income and f is the size of the punishment (the fine rate) if caught. In one sense, the model adapts the standard crime model of Becker (1968) to the taxation case. In another sense, tax evasion is part of optimal portfolio choice: the individual who chooses to evade taxesin effect makes a risky bet thatshe will not be caught and convicted. However, the logic is simple once one realizes that tax evasion is treated as a risky gamble or a problem in optimal portfolio choice. The penalty if an individual is caught, ftE, issimply a constant multiple of the amount of tax evaded tE. Thus, if the tax rate rises, both the gainsfrom evasion and the penalty rise by the same proportion, and there is no substitution effect for or away from evasion. There is an income effect, however: the individual is poorer as a result of the possibility of paying a higher penalty. This will make her take less risk, hence evade less at higher tax rates. Of course this relationship is derived from individual behavior and only holds at the individual level. The aggregate level of evasion may well move in a different direction as the level of tax affects the number of taxpayers who choose to evade.

Given that the problem of tax evasion appears to be more substantial in institutionally less developed countries (i.e., transition countries), and since in this paper we intend to look at the role of informal institutions on the decision to evade taxes, transition countries provide an excellent test bed for our ideas. About a decade ago, these countries went through an institutional shock, caused by the collapse of former communist regime. The level of the institutional shock varied per country, depending on the type of regime. On one hand, the communist regime was over-organized, where bureaucratic orders and ideological repression determined what individuals had to do. On the other hand, it was characterized by organizational failure, which motivated individualsto create and rely on informal networks. “Such a ‘dual society’ of formal versus informal networks [institutions] was far more developed in the Soviet Union, where it had been in place for more than 70 years, than in the Czech Republic [for example]” (Rose, 2000). In Eastern Europe,similar characteristics were observed in Albania, where the totalitarian regime lasted for more than 40 years. As a consequence, these societies experienced significant distrust in the government and formal institutions. The substitute was found in family-, friends- or local networks. After the collapse of communism, in countries where the ‘dual society’ was dominant, and where in addition the new governments did not manage to function properly, trust has eroded even further, forcing people to invest and rely more on networks.

Indeed, the level of trust in the Russian government appears to be extremely low based on survey data used in international comparisons. Only 3.4% of the respondents think that they can trust the state. Only 25% of people appear to trust public institutions. The highest level of trust is expressed towards family members.

2.3 Mediation of attitudes

Mediator style has been defined as both a set of strategies and tactics that characterize the conduct of a case and as the role mediators perceive themselves to play in the mediation of a conflict. Mediator styles that have received the most attention in the practitioner literature include the evaluative, facilitative, and transformative styles. Moreover, mediator style is of particular interest to researchers and practitioners alike because of its presumed influence on the process and outcomes of mediation and the disputing parties' satisfaction with mediation services.

Despite its central importance, however, research on mediation style has been relatively meager and methodologically haphazard. Although mediation style is analogous to the major models used in psychotherapy (e.g., the cognitive and behavioral models of practice), variation among mediator styles has not been systematically measured. The opposite can be said in the field of psychotherapy wherein differing models of practice have been measured using psychometrically valid scales and these efforts have furthered the theory building process in psychotherapy and strongly influenced research on outcome comparisons among the different styles. As a result, there is no agreed upon metric for assessing mediator style, thus retarding efforts to systematically assess its impact on the delivery of mediation services.

Field studies of mediator style. Few studies have explored the relationship between global mediator stylistic thinking and mediator behavior. These studies have also used various methods to examine mediator style: observing mediation sessions, interviewing mediators postsession, case studies, and self-report questionnaires. Mediators adopting this approach encouraged parties to engage in a full expression of their feelings and attitudes. Emphasizing empathy, exploring past relationships and discussing issues not readily raised by the parties were key behaviors of therapeutic mediators. Therapeutic mediators believed these cathartic techniques would lead to a resolution.

In this thesis, the mediation of attitude is deeply analysed in the section 3.2.2 The Paired T-Test Analysis of Soft-Sell Ad and the section 3.2.4 The Paired T-Test Analysis of the Hard-Sell Ad.

2.4 Methodology

A web-based survey format was used distribute the questionnaire created. There are several advantages to using a web-based format:

1. Dramatically decreased response times. Typical turnaround time is four to six weeks with traditional mail surveys, two to three weeks for telephone surveys, and only 2 to 3 days for web-based surveys
2. Reduced cost. Costs for e-mail and web-based surveys can be substantially lower than for traditional mail surveys because there are no printing, postage, or stationery costs.
3. Web-based surveys are 50% less expensive to implement than telephone surveys, and 20% less expensive than mail surveys
4. Efficient data entry. An electronic survey can be configured to send data to a database or spreadsheet, eliminating the need for manual data entry

Starting with the filtering questions including;

1. Email address *

2. Are you a *
   - Working Professional
   - Home Maker
   - Student

- Retired Individual

3. What is your gender?
- Female
- Male

4. What is your age group?
- 18-30 Years
- 31-40 Years
- 41-50 Years
- 51-60 Years
- 60+ Years

5. Which country are you living in?

6. I predominantly travel by *
- Public Transport
- Self Commute
- Both

The Part A was to create and share the Attitude General Questions on the 7-point scale with 1 Surely disagree / 7 Surely agree

1. Surely disagree
2. Middle disagreement
3. Slightly disagree
4. Neither agree nor disagree
5. Slightly agree
6. Middle agreement
7. Surely agree

The Attitude Generaal questions were

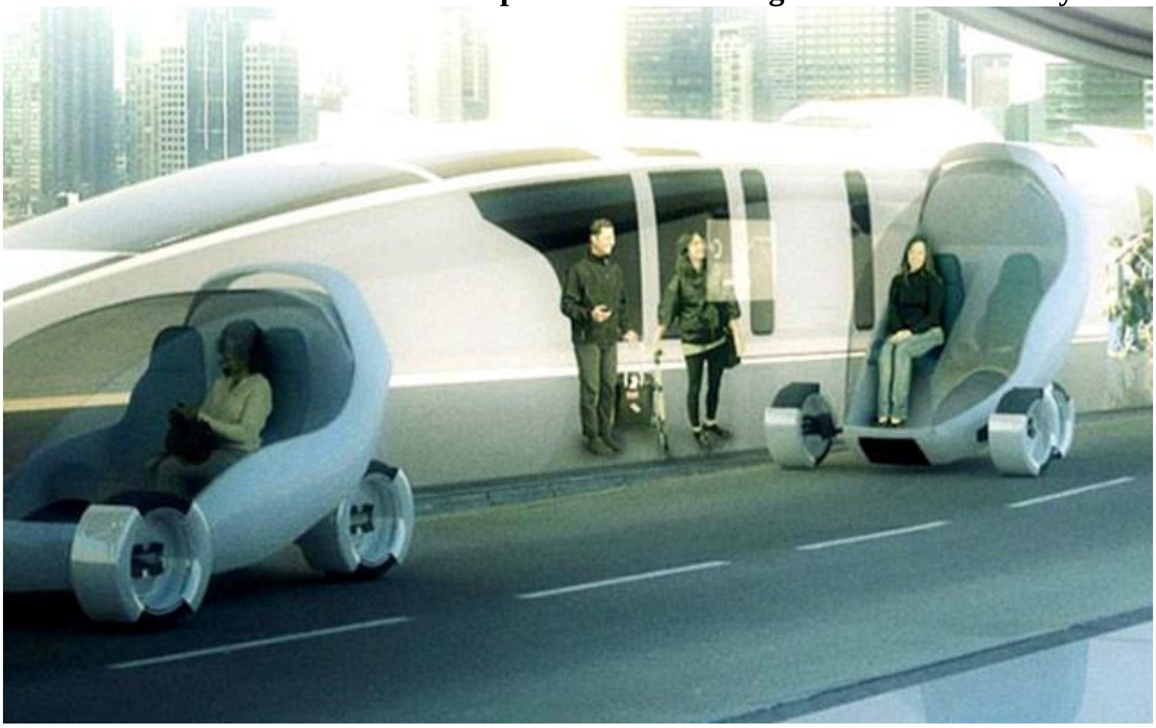
- Smart Mobility is a future fantasy
- My general opinion about Smart Mobility is unfavorable
- Smart Mobility helps raise our standard of living
- Overall, I do want the Public Transport to improve
- Present infrastructure is sufficient to sustain mass commute
- It provides high quality of commute
- Overall, I do want the Self Commute to improve

The three questions about attitude general (Muehling, 1987) are about institution of Smart-mobility. Therefore, the questions were;

4. Overall, Smart mobility is good (strongly disagree = bad --- strongly agree = good)
5. Overall, Smart mobility is favourable (strongly disagree = unfavourable --- strongly agree = favourable)
6. Overall, Smart mobility is positive (strongly disagree = negative --- strongly agree = positive)

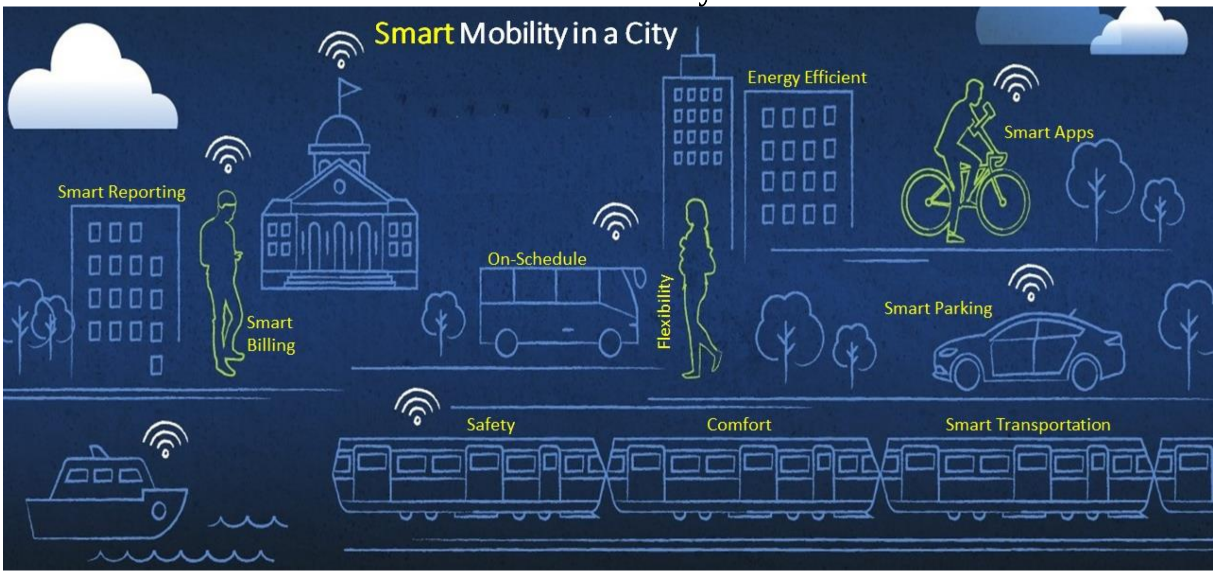
These three questions were repeat in the end of B part of questionnaire to see if AG has changed due to Aad. Two pictures of smart mobility were created. Each picture was shown to different group of respondents. Then the aim was to compare the assign differences in answers to shown picture.

The Soft-Sell advertisement depicted the socializing with Smart-Mobility



Picture 2 Soft-Sell ad of Smart-Mobility used in the questionnaire

And the Hard-Sell advertisement with the description of performance parameters in Smart-Mobility



Picture 3 Hard-Sell ad of Smart-Mobility used in the questionnaire

The Part B of the questions asked are as follows, on the 7-point scale with 1 surely disagree / 7 surely agree.

Scale

Degree	Linkert Scale to Perform Paired T-Test Analysis
Surely disagree	1
Middle disagreement	2
Slightly disagree	3
Neither agree nor disagree	4
Slightly agree	5
Middle agreement	6
Surely agree	7

Table 5 Linkert 7-point Scale used in the questionnaire

Questions

- It improves the general mobility of the citizens
- It negatively impact Taxation
- Laws and legal aspects are complicated
- It increases un-employment
- It utilizes clean energy hence reduced emissions
- It is cost effective in a long run
- It manages my speed limits notifications automatically
- Smart Mobility is about high comfort commute
- It contribute to increase my overall personal productivity
- Smart Mobility Infrastructure is also about better utilization of land
- It automates my travel bills
- It helps to improve my schedule
- It helps reducing accidents
- I like to drive myself than sitting in an Autonomous vehicle
- It is energy efficient
- It offers no delays in the schedule
- It gives me the flexibility with availability of best-fitting transport mode
- It requires minimum governance
- It provides added value services such as internet or emergency services etc.
- It is about high safety travel
- It is connected with other smart services (Smart City, Smart Grid, Smart Education, Smart Waste Management etc.)
- It helps reduce traffic congestion
- It gives me analytics & reports of my commute
- It is environment friendly
- It reduces my stress when I commute
- There are enough budget and funds to implement the Smart Mobility infrastructure
- It needs a solid strategy before implementations
- Smart Parking diminishes parking issues

The responses were recorded and analysed in Sectio 3. Analytical Part.

3. Analytical part

3.1 CPM characteristics

CPM (Critical Path Method) network planning is a technique used in the analysis. This technique "of the work done towards the realization of a project, when to start, and what bits work as well as when and what to do with the" grid presents visual information to the manager (Mccahon and Lee,1989). CPM, the duration of activity is assumed to be constant when the deterministic method (Meyer, Loch, Pich, 2014). In this study, the problem of CPM subjective interest based merging method is used with the membership functions. In this method, the formula of triangular fuzzy numbers,

$$(a+2b+c)/4$$

each with a designated representative values and values that are greater among themselves pessimistic, optimistic median optimal value was considered as the lowest value were calculated CPM (Baykasoglu, Gokcen, 2012).

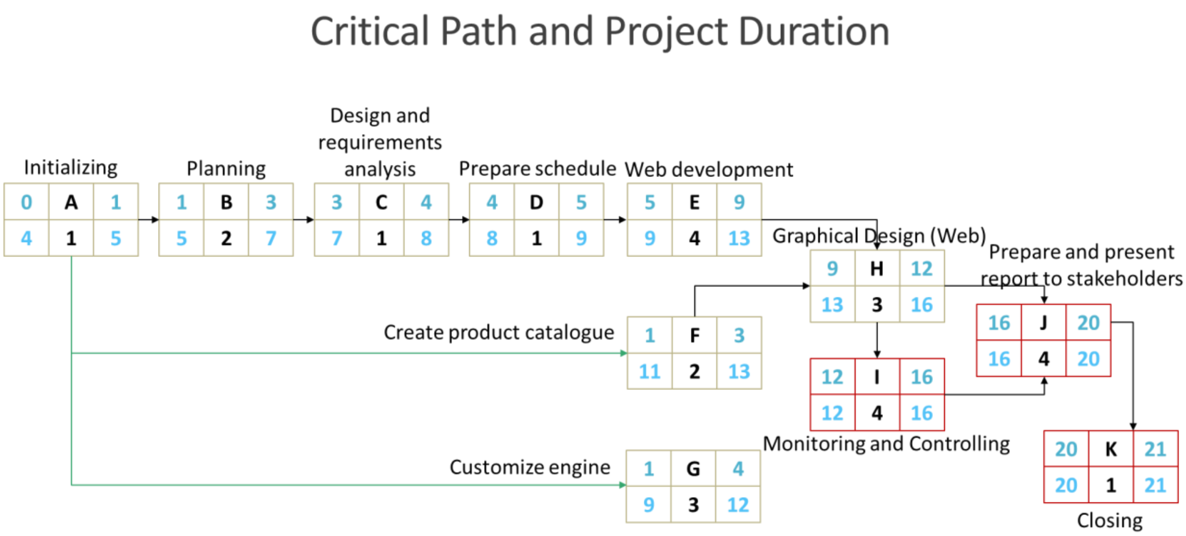
For this thesis, for example commuters may need a website interface to help them for general e-mobility services. Following are the assumptions taken for such web portal:

Assumptions

1. Website will have 100 e-Mobility services to cater like e-billing, reporting etc.
2. The main site, as well as forum and community pages will have administrative panel with the capability to add/remove/edit any content in a non-technical fashion.
3. The city staff will have the ability to maintain the site content (including the product database) without the help of programmers.

Activities		**Duration** (*weeks*)	**Predecessor**
Initializing	A	1	-
Planning	B	2	A
Design and requirements analysis	C	1	B
Prepare schedule	D	1	C
Website development	E	4	D
Create product catalogue	F	2	A
Customize engine	G	3	A
Graphical Design (Web)	H	3	E, F
Monitoring and Controlling	I	4	G, H
Prepare and present report to stakeholders	J	4	I
Closing	K	1	J

Table 6 Activities based on assumption



Picture 4 Critical Path generated for the assumed activities

3.2 Answered hypotheses

The total number of responses recorded were 171, which included 90 responses for the Soft-Sell Ad and 81 responses for the Hard-Sell Ad.

3.2.1 Internation Comparison of Commute Preferences

Profession	For Hard-Sell Ad	For Soft-Sell Ad
Home Maker	7	12
Retired Individual	7	4
Student	22	23
Working Professional	45	51
Grand Total	81	90

Table 7 responses to the question about the profession of the respondents

Gender	For Hard-Sell Ad	For Soft-Sell Ad
Female	38	44
Male	43	46
Grand Total	81	90

Table 8 responses to the question about the gender of the respondents

I predominantly travel by	For Hard-Sell Ad	For Soft-Sell Ad
Both	14	14
Public Transport	43	38
Self-Commute	24	38
Grand Total	81	90

Table 9 responses to the question about the commute preferences of the respondents

Age Groups	For Hard-Sell Ad	For Soft-Sell Ad
18-30 Years	35	31
31-40 Years	28	43
41-50 Years	8	10
51-60 Years	8	5
60+ Years	2	
Grand Total	81	89

Table 10 responses to the question about the age-groups of the respondents

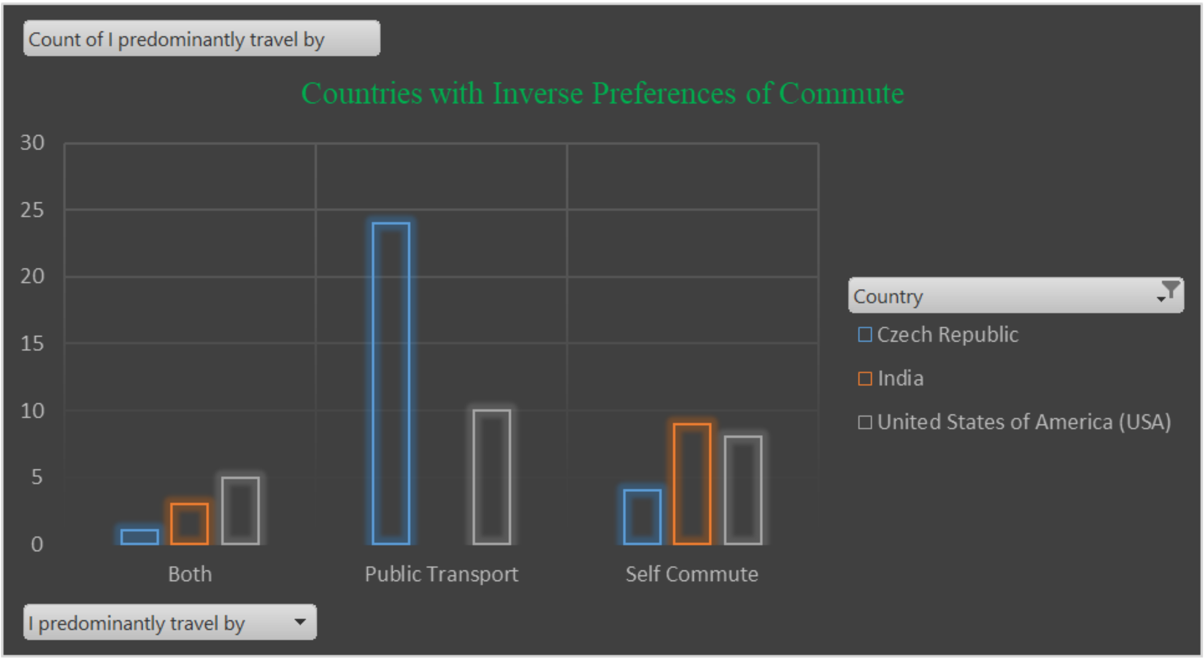
For Hard-Sell Ad	
Armenia	1
Australia	1
Bhutan	1
Czech Republic	29
Egypt	1
Finland	1
France	5
Germany	1
Great Britain	2
India	12
Nepal	1
Philippines	1
United States of America (USA)	23
(blank)	2
Grand Total	81

For Soft-Sell Ad	
Austria	3
Canada	5
Czech Republic	26
France	1
Germany	3
Great Britain	6
India	26
Malta	1
United States of America (USA)	15
Uruguay	1
(blank)	3
Grand Total	90

Table 11 responses to the question about the country of the respondents

3.2.1.1 Countries with inverse preferences of commute

Picture 5 Result of the Inverse Commute Preferences from the responses of the **Soft-Sell Ad**

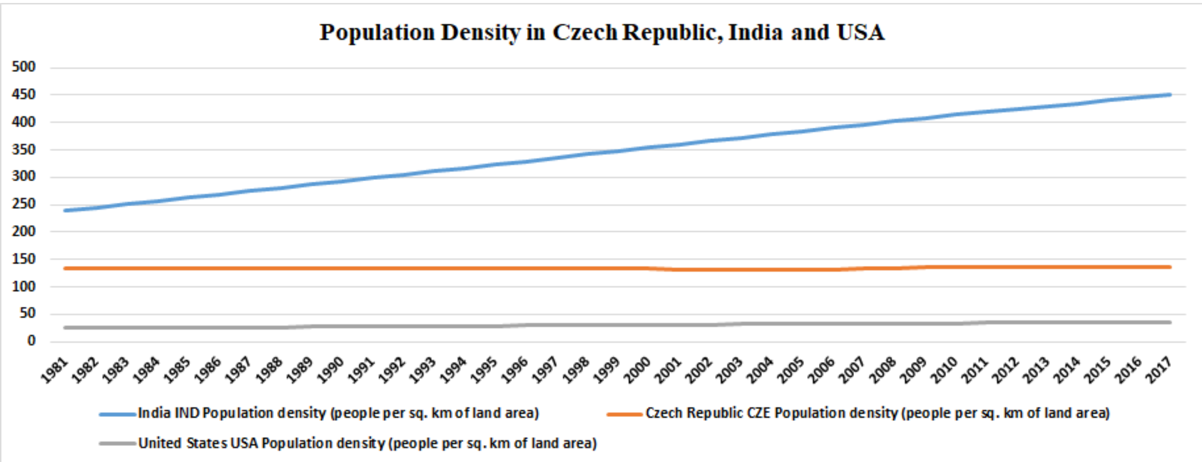


Picture 6 Result of the Inverse Commute Preferences from the responses of the **Hard-Sell Ad**

3.2.1.1 Population density (people per sq. km of land area)

Population density is midyear population divided by land area in square kilometers. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. Land area is a country's total area, excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones. In most cases the definition of inland water bodies includes major rivers and lakes.

The following chart represents the population explosion in Czech Republic, India and USA



Picture 7 Graph generated for the population density in Czech Republic, India and USA (Worldbank, 2018)

Country Name	Year 2017
India	450.418617
Czech Republic	137.175534
United States	35.6077646

Table 12 Population density in India, Czech Republic and USA (Worldbank, 2018)

Conclusion: Thus, the hypothesis that countries very dense population with experience from blocked traffic will prefers to self-commute which is opposite to the hypothesis.

3.2.2 Answers to the Soft-Sell Advertisement

Questions	No of Responses	Surely disagree (%)	Middle disagreement (%)	Slightly disagree (%)	Neither agree nor disagree (%)	Slightly agree (%)	Middle agreement (%)	Surely agree (%)	Total (%)
Part A Questionnaire									
My general opinion about Smart Mobility is unfavourable	90	18%	19%	14%	3%	2%	11%	32%	100%
Overall, I do want the Public Transport to improve	90	1%	1%	0%	3%	16%	24%	54%	100%
Overall, I do want the Self Commute to improve	90	1%	0%	0%	6%	20%	27%	47%	100%
Smart Mobility is a future fantasy	90	8%	10%	4%	7%	9%	28%	34%	100%
Present infrastructure is sufficient to sustain mass commute	90	11%	8%	16%	7%	7%	17%	36%	100%
Smart Mobility helps raise our standard of living	90	0%	0%	1%	6%	21%	30%	42%	100%
It provides high quality of commute	90	0%	0%	3%	8%	26%	24%	39%	100%
Overall, Smart Mobility is Good	90	0%	0%	0%	0%	12%	23%	64%	100%
Overall, Smart Mobility is Favourable	90	0%	1%	0%	0%	13%	17%	69%	100%
Overall, Smart Mobility is Positive	90	0%	0%	0%	1%	13%	19%	67%	100%
Part B Questionnaire									
Smart Mobility is about high comfort commute	90	0%	1%	4%	4%	24%	30%	36%	100%
It is about high safety travel	90	0%	0%	1%	9%	19%	24%	47%	100%
It offers no delays in the schedule	90	0%	0%	7%	14%	18%	28%	33%	100%
It helps to improve my schedule	90	0%	0%	2%	9%	26%	24%	39%	100%
It is environment friendly	90	0%	0%	2%	0%	22%	42%	33%	100%
It utilizes clean energy hence reduced emissions	90	0%	1%	1%	7%	20%	28%	43%	100%
It is connected with other smart services (Smart City, Smart Grid, Smart Education, Smart Waste Management etc.)	90	0%	0%	1%	2%	10%	32%	54%	100%
It provides added value services such as internet or emergency services etc.	90	0%	1%	0%	4%	16%	32%	47%	100%
It improves the general mobility of the citizens	90	0%	0%	2%	3%	17%	43%	34%	100%
It gives me analytics & reports of my commute	90	0%	0%	1%	11%	22%	27%	39%	100%
It helps reduce traffic congestion	90	0%	0%	4%	7%	16%	32%	41%	100%
It is cost effective in a long run	90	0%	0%	1%	2%	19%	34%	43%	100%
It requires minimum governance	90	3%	1%	6%	14%	17%	29%	30%	100%
Smart Parking diminishes parking issues	90	0%	2%	1%	4%	19%	41%	32%	100%
It contribute to increase my overall personal productivity	90	0%	0%	1%	9%	9%	41%	40%	100%
It reduces my stress when I commute	90	0%	0%	1%	8%	14%	22%	54%	100%
Smart Mobility Infrastructure is also about better utilization of land	90	0%	0%	3%	3%	17%	32%	44%	100%

It manages my speed limits notifications automatically	90	1%	0%	1%	10%	22%	30%	36%	100%
It automates my travel bills	90	0%	1%	3%	12%	16%	19%	49%	100%
It gives me the flexibility with availability of best-fitting transport mode	90	0%	0%	1%	3%	23%	27%	46%	100%
It is energy efficient	90	0%	0%	0%	4%	23%	33%	39%	100%
It negatively impact Taxation	90	11%	10%	17%	8%	8%	26%	21%	100%
It increases un-employment	90	11%	12%	9%	3%	10%	20%	34%	100%
Laws and legal aspects are complicated	90	2%	9%	6%	12%	13%	21%	37%	100%
There are enough budget and funds to implement the Smart Mobility infrastructure	90	2%	3%	2%	7%	8%	28%	50%	100%
I like to drive myself than sitting in an Autonomous vehicle	90	2%	2%	7%	11%	18%	29%	31%	100%
It needs a solid strategy before implementations	90	0%	1%	2%	3%	11%	29%	53%	100%
It helps reducing accidents	90	0%	0%	2%	8%	21%	30%	39%	100%
After seeing Soft-Sell Ad, Overall, Smart Mobility is Good	90	0%	0%	0%	2%	3%	19%	76%	100%
After seeing Soft-Sell Ad, Overall, Smart Mobility is Favourable	90	0%	0%	0%	1%	7%	19%	73%	100%
After seeing Soft-Sell Ad Overall, Smart Mobility is Positive	90	0%	0%	1%	0%	7%	12%	80%	100%
Questions on IoT									
IoT needs better government regulating laws	90	0%	1%	3%	1%	17%	21%	57%	100%
IoT makes us vulnarable to cyber attacks	90	1%	0%	6%	8%	20%	22%	43%	100%
It is easy to connect things together, but much harder to decide what data should be allowed to read	90	0%	3%	4%	6%	14%	28%	44%	100%
Better services to the citizens is more important than the confidentiality of data	90	1%	0%	11%	2%	14%	24%	47%	100%
Confidentiality can be managed with stringent laws	90	12%	8%	1%	6%	4%	14%	54%	100%
IoT adversly affects the employment rate	90	11%	14%	3%	6%	14%	14%	37%	100%
Interoperability of IoT Devices & Apps from the different suppliers is a huge challenge	90	0%	0%	2%	8%	22%	28%	40%	100%
Overall, IoT is good	90	0%	1%	0%	1%	7%	14%	77%	100%
Overall, IoT is favorable	90	0%	1%	1%	2%	9%	19%	68%	100%
Overall, IoT is positive	90	0%	1%	0%	1%	8%	16%	74%	100%

Table 13 responses to the soft-sell ad

3.2.3 The Paired T-Test Analysis & Conclusions from Soft-Sell Ad responses

t-Test: Paired Two Sample for Means

Overall, Smart Mobility is Good		
	Before	*After*
Mean	6.522222	6.677777778
Variance	0.499501	0.42309613
Observations	90	90
Pearson Correlation	0.345707	
Hypothesized Mean Difference	0	
df	89	

t Stat	**-1.89767**
P(T<=t) one-tail	**0.030491**
t Critical one-tail	**1.662155**
P(T<=t) two-tail	0.060981
t Critical two-tail	1.986979

Table 14 The Paired T-Test Analysis from Soft-Sell Ad responses

Conclusion:For Soft-Sell Ad, Overall, Smart Mobility is Good

The difference between the **t Stat** is smaller than **t Critical one-tail** indicates that the AG has not-changed due to AAD.

Since the value of P(T<=t) one-tail is 0.030491, If the calculated P-value is less than 0.05 (*in this case it is less*), the conclusion is that, statistically, the mean difference between the paired observations is significantly different from 0, thus AG has changed due to AAD.

t-Test: Paired Two Sample for Means

Overall, Smart Mobility is Favorable

	Before	*After*
Mean	6.511111111	6.644444444
Variance	0.747066167	0.433957553
Observations	90	90
Pearson Correlation	0.599025098	
Hypothesized Mean Difference	0	
df	89	
t Stat	-1.790867725	
P(T<=t) one-tail	0.038357153	
t Critical one-tail	1.662155326	
P(T<=t) two-tail	0.076714306	
t Critical two-tail	1.9869787	

Table 15 The Paired T-Test Analysis from Soft-Sell Ad responses

Conclusion:For Soft-Sell Ad, Overall, Smart Mobility is Favorable

The difference between the **t Stat** is greater than **t Critical one-tail** indicates that the AG has changed due to AAD.

Since the value of P(T<=t) one-tail is 0.038357153, If the calculated P-value is less than 0.05 (*in this case it is less*), the conclusion is that, statistically, the mean difference between the paired observations is significantly different from 0, thus AG has changed due to AAD.

t-Test: Paired Two Sample for Means

Overall Smart Mobility is Positive

	Before	*After*
Mean	6.511111111	6.7
Variance	0.589762797	0.482022472
Observations	90	90
Pearson Correlation	0.396182705	
Hypothesized Mean Difference	0	
df	89	
t Stat	-2.223824435	
P(T<=t) one-tail	0.014345635	

t Critical one-tail	1.662155326
P(T<=t) two-tail	0.028691269
t Critical two-tail	1.9869787

Table 16 The Paired T-Test Analysis from Soft-Sell Ad responses

Conclusion: For Soft-Sell Ad, Overall, Smart Mobility is Positive

The difference between the **t Stat** is greater than **t Critical one-tail** indicates that the AG has changed due to AAD.

Since the value of P(T<=t) one-tail is 0.014345635, If the calculated P-value is less than 0.05 (*in this case it is less*), the conclusion is that, statistically, the mean difference between the paired observations is significantly different from 0, thus AG has changed due to AAD.

3.2.4 Answers to the Hard-Sell Advertisement

Questions	Total	Surely disagree (%)	Middle disagreement (%)	Slightly disagree (%)	Neither agree nor disagree (%)	Slightly agree (%)	Middle agreement (%)	Surely agree (%)	Total (%)
Part A Questionnaire									
My general opinion about Smart Mobility is unfavourable	81	22%	28%	21%	12%	9%	4%	4%	100%
Overall, I do want the Public Transport to improve	81	0%	7%	10%	12%	19%	22%	30%	100%
Overall, I do want the Self Commute to improve	81	4%	9%	4%	4%	25%	30%	26%	100%
Smart Mobility is a future fantasy	81	19%	19%	12%	10%	14%	19%	9%	100%
Present infrastructure is sufficient to sustain mass commute	81	21%	16%	9%	9%	20%	12%	14%	100%
Smart Mobility helps raise our standard of living	81	1%	6%	5%	14%	25%	31%	19%	100%
It provides high quality of commute	81	4%	6%	1%	14%	26%	26%	23%	100%
Overall, Smart Mobility is Good	81	2%	5%	9%	11%	19%	17%	37%	100%
Overall, Smart Mobility is Favourable	81	2%	5%	9%	11%	19%	25%	30%	100%
Overall, Smart Mobility is Positive	81	2%	6%	10%	7%	16%	25%	33%	100%
Part B Questionnaire									
Smart Mobility is about high comfort commute	81	1%	6%	9%	11%	26%	26%	21%	100%
It is about high safety travel	81	0%	5%	5%	9%	36%	25%	21%	100%
It offers no delays in the schedule	81	0%	6%	9%	17%	25%	30%	14%	100%
It helps to improve my schedule	81	1%	4%	9%	20%	31%	16%	20%	100%
It is environment friendly	81	2%	11%	5%	14%	19%	31%	19%	100%
It utilizes clean energy hence reduced emmissions	81	0%	6%	9%	17%	20%	25%	23%	100%
It is connected with other smart services (Smart City, Smart Grid, Smart Education, Smart Waste Management etc.)	81	0%	6%	5%	15%	21%	27%	26%	100%
It provides added value services such as internet or emergency services etc.	81	1%	4%	6%	11%	30%	22%	26%	100%
It improves the general mobility of the citizens	81	1%	4%	6%	14%	23%	27%	25%	100%
It gives me analytics & reports of my commute	81	1%	10%	6%	15%	27%	23%	17%	100%
It helps reduce traffic congestion	81	1%	6%	6%	7%	31%	31%	17%	100%
It is cost effective in a long run	81	1%	4%	9%	15%	25%	26%	21%	100%

It requires minimum governance	81	2%	5%	14%	20%	27%	19%	14%	100%
Smart Parking diminishes parking issues	81	1%	2%	10%	15%	26%	28%	17%	100%
It contribute to increase my overall personal productivity	81	0%	5%	9%	12%	28%	27%	19%	100%
It reduces my stress when I commute	81	2%	1%	6%	11%	27%	26%	26%	100%
Smart Mobility Infrastructure is also about better utilization of land	81	0%	9%	11%	16%	22%	28%	14%	100%
It manages my speed limits notifications automatically	81	0%	9%	4%	25%	22%	21%	20%	100%
It automates my travel bills	81	2%	6%	9%	10%	33%	19%	21%	100%
It gives me the flexibility with availability of best-fiting transport mode	81	1%	4%	14%	14%	26%	19%	23%	100%
It is energy efficient	81	1%	5%	7%	16%	25%	22%	23%	100%
It negatively impact Taxation	81	14%	26%	11%	25%	4%	14%	7%	100%
It increases un-employment	81	11%	23%	21%	14%	16%	12%	2%	100%
Laws and legal aspects are complicated	81	11%	23%	11%	21%	10%	16%	7%	100%
There are enough budget and funds to implement the Smart Mobility infrastructure	81	4%	6%	11%	14%	22%	21%	22%	100%
I like to drive myself than sitting in an Autonomous vehicle	81	1%	6%	19%	21%	28%	9%	16%	100%
It needs a solid strategy before implementations	81	1%	7%	7%	6%	30%	16%	32%	100%
It helps reducing accidents	81	1%	6%	5%	19%	28%	27%	14%	100%
After seeing the Hard-Sell Ad, Overall, Smart Mobility is Good	81	2%	4%	15%	6%	10%	22%	41%	100%
After seeing the Hard-Sell Ad, Overall, Smart Mobility is Favourable	81	0%	5%	15%	11%	15%	20%	35%	100%
After seeing the Hard-Sell Ad, Overall, Smart Mobility is Positive	81	1%	5%	7%	6%	16%	23%	41%	100%
Questions on IoT									
IoT needs better government regulating laws	81	1%	7%	11%	16%	19%	20%	26%	100%
IoT makes us vulnarable to cyber attacks	81	5%	5%	19%	19%	7%	7%	38%	100%
It is easy to connect things together, but much harder to decide what data should be allowed to read	81	5%	12%	15%	17%	20%	12%	19%	100%
Better services to the citizens is more important than the confidentiality of data	81	21%	11%	10%	9%	17%	11%	21%	100%
Confidentiality can be managed with stringent laws	81	20%	10%	12%	12%	20%	4%	22%	100%
IoT adversly affects the employment rate	81	25%	16%	27%	14%	4%	7%	7%	100%
Interoperability of IoT Devices & Apps from the different suppliers is a huge challenge	81	4%	10%	12%	16%	28%	11%	19%	100%
Overall, IoT is good	81	1%	5%	6%	16%	10%	26%	36%	100%
Overall, IoT is favorable	81	1%	6%	12%	15%	10%	28%	27%	100%
Overall, IoT is positive	81	1%	4%	11%	7%	12%	32%	32%	100%

Table 17 The responses for the Hard-Sell Ad

3.2.5 The Paired T-Test Analysis & Conclusion from Hard-Sell Ad responses

t-Test: Paired Two Sample for Means

Overall Smart Mobility is Good		
	Before	*After*
Mean	5.382716049	5.469135802

Variance	2.839197531	3.052160494
Observations	81	81
Pearson Correlation	0.62614267	
Hypothesized Mean Difference	0	
df	80	
t Stat	**-0.523790133**	
P(T<=t) one-tail	0.300936302	
t Critical one-tail	**1.664124579**	
P(T<=t) two-tail	0.601872605	
t Critical two-tail	1.990063421	

Table 18 The Paired T-Test Analysis from Hard-Sell Ad responses

Conclusion: For Hard-Sell Ad, Overall, Smart Mobility is good

The difference between the **t Stat** is smaller than **t Critical one-tail** indicates that the AG has not-changed due to AAD.

Since the value of P(T<=t) one-tail is 0.300936302, If the calculated P-value is less than 0.05 (*in this case it is more*), the conclusion is that, statistically, the mean difference between the paired observations is significantly different from 0, thus there is no change in the opinion in AG due to AAD.

t-Test: Paired Two Sample for Means

Overall, Smart Mobility is Favorable	*Before*	*After*
Mean	5.308641975	5.333333333
Variance	2.666049383	2.65
Observations	81	81
Pearson Correlation	0.689738396	
Hypothesized Mean Difference	0	
df	80	
t Stat	**-0.173032135**	
P(T<=t) one-tail	0.431531605	
t Critical one-tail	**1.664124579**	
P(T<=t) two-tail	0.863063211	
t Critical two-tail	1.990063421	

Table 19 The Paired T-Test Analysis from Hard-Sell Ad responses

Conclusion: For Hard-Sell Ad, Overall, Smart Mobility is Favorable

The difference between the **t Stat** is smaller than **t Critical one-tail** indicates that the AG has not-changed due to AAD.

Since the value of P(T<=t) one-tail is 0.431531605, If the calculated P-value is less than 0.05 (*in this case it is more*), the conclusion is that, statistically, the mean difference between the paired observations is significantly different from 0, thus there is no change in the opinion in AG due to AAD.

t-Test: Paired Two Sample for Means

Overall Smart Mobility is Positive	*Before*	*After*
Mean	5.358024691	5.641975309
Variance	2.907716049	2.482716049
Observations	81	81
Pearson Correlation	0.634497369	
Hypothesized Mean Difference	0	
df	80	
t Stat	-1.815758038	
P(T<=t) one-tail	0.036577105	

t Critical one-tail	1.664124579
P(T<=t) two-tail	0.073154211
t Critical two-tail	1.990063421

Table 20 The Paired T-Test Analysis from Hard-Sell Ad responses

Conclusion: For Hard-Sell Ad, Overall, Smart Mobility is Positive

The difference between the **t Stat** is smaller than **t Critical one-tail** indicates that the AG has not-changed due to AAD.

Since the value of P(T<=t) one-tail is 0.036577105, If the calculated P-value is less than 0.05 (*in this case it is less*), the conclusion is that, statistically, the mean difference between the paired observations is significantly different from 0, thus AG has changed due to AAD.

3.3 Recommendations with BEP

- ✓ From the conclusions of the chapter 3.2.1 and subchapter 3.2.1.1 above, the hypothesis was proved to be false and people in the densely populated country prefers self-commute. It is recommended to promote IoT based cars in the densly populated countries.
- ✓ From the conclusion of the chapter 2.1.1, it was found that the overall General Attitude towards IoT is Good, Favourable and Positive. Thus, promotion of the benefits of IoT with Smart Mobility (Self Commute or Public Transport) is recommended.
- ✓ From the conclusions of the chapter 3.2.3 above, Soft-Sell Ads are recommended for Smart-Mobility.
- ✓ From the conclusions of the chapter 3.2.5 above, it was understood that the complexities in the hard-sell advertisement may confuse the people about the benefits Smart-Mobility brings to their lives and soft-sell ads was percieved as hard-sell.

4. Conclusions

This thesis was based on the hypothesis that more densely populated countries prefers public transport, but it was found that people in the densly populated countries prefers to sel-commute than taking public transport. This finding is important to understand the return of investment to the Automotive companies to promote the upcoming car models equipped with smart-mobility features.

Furthermore, the evidence that there was no change found in the opinion in AG due to AAD in the hard-sell ads and AG was changed due to AAD in the soft-sell ads, results in the recommendations the type of Ads Transportaion and Automotive companies can choose to influence return of investments in their products.

The general attitude of people towards IoT was favourable, good and positive. Thus it would be reasonable to promote IoT, for the Transportation and Automotive manufacturers, through test drivings because the latest models of cars and transportation might be expensive.

Abstract

This document provides an overview of the analysis of the General Attitude of people towards Smart-Mobility and their attitude towards advertisement. The Seven point Linkert scale survey was used and Paired T-Test Analysis was performed. The General Attitude towards IoT was evaluated. Two advertisements questionnaire on Smart Mobility were created, one of which was Hard-Sell and the other was Soft-Sell and distributed between two different groups of respondants. Total 171 responses were analysed out of which 90 responses were recorded for Soft-Sell ad and 81 were recorded for Hard-Sell ad.

Keywords: AG, AAD, Smart Mobility, IoT, Attitude, Survey

JEL Classification Codes:

1. M37 Advertising
2. O35 Social Innovation
3. Q55 Technological Innovation

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