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A Model of Crucial Factors Influencing on the Innovation Resistance for Purchasing Innovative Passenger Vehicles in Automotive Industry of Iran

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A Model of Crucial Factors Influencing on the Innovation Resistance for Purchasing Innovative Passenger Vehicles in Automotive Industry of Iran

By

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Abstract

Purpose: The goal of this thesis is to render a model of influencing factors on Innovation resistance for purchasing innovative passenger vehicles in Auto industry of Iran.

Design/Methodology/Approach: The innovative passenger vehicles that are produced by 4 car manufacturing companies of Iran are selected.

Data is collected in two phases, at the first step which is qualitative phase, 13 questionnaires are distributed among panel of experts who are managers of top experts of SAIPA car manufacturing company (Appendix 1).

Then in the second phase which is quantitative, the questionnaire which is prepared based on the results of first phase, are distributed among 265 customers of Kerman Khodro Co., Modiran Khodro Co. and Iran Khodro Co. that have resisted to purchase innovative vehicle of SAIPA (Appendix 2).

The resistance factors are detected and grouped trough Exploratory Factor Analysis techniques, and the Structural Equation Modeling (SEM), which is a very general statistical modeling technique that is normally used in the behavioral sciences. It can be viewed as a combination of factor analysis and regression or path analysis, so by SEM method will provide the aforementioned impacts of these resistance factors on resistance purchasing behavior.

Findings: The results of qualitative phase show that Trialability, Co-dependence, Visibility, Realization, Relative advantage and Value factors are the most influential factors on innovation resistance which are clustered in Functional barriers.

On the other hand, Economic Risk, Functional Risk, Usage, Image, Previous Innovation Experience and Usefulness are the most influential factors on Innovation Resistance, which are categorized in Psychological barriers. Additionally, the Demographic barriers extracted as influential factors on innovation resistance analyzed are: Age, Income and Education.

The new factor of "After Sales Services" is recommended by panel of experts from Delphi model, in order to add to influential factors on Innovation Resistance. Thereafter, the above-mentioned factors have a crucial and prominent role in reducing the resistance of consumers in order to purchase innovative passenger vehicles.

In the second phase which is quantitative step of this research, based on the results of first step the questionnaire has been prepared and are distributed among 265 ordinary customers of three Iranian car manufacturing companies.

The abovementioned factors resulting of the first step of this research are used in order to assess its impact on Intention to buy, and the mediation role of Active Innovation Resistance between Barriers and Intention to buy. A research model, in which these constructs are included is proposed and analyzed through Structural Equation Modeling (SEM). Results show that ……

Research Implications: A new fresh model analyzing the mediator role of Active Innovation Resistance shed light to conceptualize the way Barriers (both Functional and Psychological) impacts on customer behavior, in the specific setting of innovative automotive industry in Iran.

Practical Implications: The propagation of innovation in automotive industry is challenging and imposing huge investment to manufacturer, so they should pay attention to real barriers for resisting to purchase their innovative vehicles.

Moreover, customers, who are playing the main role for their success, might adjust its intention to purchase these innovative cars, and foster the Iranian society to be interested in innovation of car manufactures.

Keywords

Innovation; Active Innovation Resistance; Intention to Buy; New Product Adoption; Innovation Rejection; Consumer Purchasing Behavior.

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CHAPTER 1- INTRODUCTION

1.1. Introduction

"An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behavior is concerned, whether or not an idea is "objectively" new as measured by the lapse of time since its first use or discovery" (Rogers, 1983). This author also highlights the importance of innovation from another point of view: "The perceived newness of the idea for the individual determines his or her reaction to it. If the idea seems new to the individual, it is an innovation".

More recently, Bissola, Imperatori, & Colonel (2014) and Bissola et al. (2014) state that setting up an innovation is a process that does not have any obvious outcome and starting to implement an innovation can either positively or negatively impact on company's competitiveness.

However, innovative products might also fail and act as an disinvestment on a wide range due to loss of future revenues and reputation (Talke & Heidenreich, 2014). In this vain, previous researches show that the failure of innovative products are especially harmful to high-equity brands that have preannounced the innovation (Liao, Chou, & Lin, 2014) and even might jeopardize the competitiveness of companies (Bayus, Erickson, & Jacobson, 2003).

The rate of failure of innovative products are reported around 40% depending on a firm's context or can be even higher (Castellion & Markham, 2013; Claudy, Garcia, & Driscoll, 2014; Heidenreich & Kraemer, 2015; Sandberg & Aarikka-stenroos, 2014). Consequently, the diagnosis of the origins of product failure is a prominent challenge for a company which are leading to innovation activities.

On the other hand obtaining a high revenues and high volume on sales rate of new products and services can help companies to reach a profit-making market position (Markham & Lee, 2013).

An unexpected low revenues from new products and services can endanger not only a firm’s competitiveness but also its revenues and its reputation and affect the brand equity (Liao et al., 2014), which might cause significant disinvestments (Bayus et al., 2003) or encourage negative reactions of investors (Urbig, Patzelt, & Schweizer, 2013).

1.2. Importance of Research

The Auto Industry is chosen in this research, since this industry has large investments for innovative products. When it encounters any failure, it jeopardizes the capital of company and in its turn it affects the brand and reputation. Therefore, these investments apparently do not yield the expected return. In this study, the auto industry of Iran is analyzed particularly.

This research aims the better understanding issues pertaining to innovation resistance in automotive industry and analyzes the most important factors that influence innovation resistance to purchase innovative cars.

The resistance factors are detected and grouped trough Exploratory Factor Analysis techniques, and the SEM method will provide the aforementioned impacts of these resistance factors on resistance purchasing behavior. The model will be developed based on the Crucial Factors Influencing on the Innovation Resistance for Purchasing Innovative Passenger Vehicles in Automotive Industry of Iran.

1.3. Practical Gap

Manufacturing new vehicle may cause unexpected failure in market, even though the innovative vehicle has obtained acceptable grade, in case these innovations are not accepted by the market. (Cecere, Corrocher, & Guerzoni, 2018; Egbue & Long, 2015; Wiedmann, Hennigs, Pankalla, Kassubek, & Seegebarth, 2011).

The high failure rates for new products, averaging around 40% across industries suggest that consumers often resist change when confronted with innovation and consumer innovation resistance is a significant reason for new product failure. Therefore, recent empirical studies have begun to focus on the phenomenon of innovation resistance (Matsuo, Minami, & Matsuyama, 2018).

Is Important for companies to analyze the potential resistance factors. Indeed, a large majority of innovations never become commercial successes, and one of the main causes for failure is consumer resistance. This high rate of failure should not be surprising because innovation requires consumers to accept several changes like price, design and performance (Mani & Chouk, 2018).

Prior research has shown that innovation resistance results primarily from functional and psychological barriers (Talke & Heidenreich, 2014). Functional barriers appear when perceived functional attributes of an innovation do not fulfil consumers' ideal

expectations. Psychological barriers emerge when perceived attributes of an innovation bring about psychological conflicts or problems for consumers (Heidenreich & Handrich, 2015).

The constant and successful market introduction of new products is of major concern to companies throughout all industries. However, empirical research points to high failure rates of innovations, indicating that most new products fail as they are rejected by consumers due to their resistance to innovation (Heidenreich & Kraemer, 2016).

The innovation literature reports high failure rates for innovations, ranging around 50% (Castellion & Markham, 2013; Heidenreich & Kraemer, 2016). Innovations that fail represent ineffective investments that cannot generate future revenues and thus might even endanger the competitive position of companies in the long run (Heidenreich & Kraemer, 2016).

The most innovations fail due to rejection by consumers. Consumers evaluate product specifications, leading to active innovation resistance (AIR) and subsequently to the decision to reject an innovation, while cognitively or physically dealing with it; if there is a critical number of active innovation rejections in a target market, revenues from new products and services decrease significantly. Moreover new product and new service failures regularly endanger the firm's overall competitiveness (Joachim, Spieth & Heidenreich, 2018).

It is well known that innovation in this particular setting requires large investments. It is of paramount importance to assure the acceptance of these innovations in order to vouch for the profitability and return of these investments in the Iranian manufacturing industry.

1.4. Theoretical Gap

According to the available resistance models which are mentioned in this proposal's literature review, none of these models are prepared to analyze the context of auto industry in Iran. This thesis proposes a holistic model in order to investigate how the barriers affect customer behavior in the context of auto industry in Iran.

1.5. Problem Statement

Since it is mentioned above that innovative products which fail in market, cause an disinvestment in huge scale and may bring the loss of reputation for legend companies, so this problem conducted this research to take place in Iran to help car manufacturing companies to manage their firm innovation activities and find model in order to decrease innovation resistance in launching innovative passenger vehicles of auto industry of Iran.

1.6. Research Propositions

1.6.1. Aims and objectives

Recognizing the reasons that consumers accept or reject innovations is a very critical issue for companies or organizations for having prosperity in innovative product development. The adoption or rejection of innovative product and the innovation is related to the characteristics of innovation and customers as well (Talke & Heidenreich, 2014).

This research defines the stimulus which induce car manufacturing companies to identify the factors influencing the innovation resistance and pave the way for studying and concentrating on these factors in order have beneficial investment on innovation and provoke their customers to purchase their innovative cars.

This research aims the better understanding issues pertaining to innovation resistance in automotive industry and analyzes the most important factors that influence innovation resistance to purchase innovative cars. It is supposed that all the influencing factors have equal effect on innovation resistance. These factors will be tested in order to prioritize them and to weight the impact of each of them on innovation resistance. Since the method of this research is Sequential Exploratory Mixed Method so this research will take place in two phases as follows:

First Phase (Qualitative Study): it will consist a literature review and a set of interviews to a panel of experts encompassed by about 13 top managers of sales, export, engineering and finally R&D departments of four car manufacturing companies of Iran (SAIPA Co., Iran Khodro Co., Kerman Khodro Co., and Modiran Khodro Co.).

Delphi method will be used for this phase in order to find factors of innovation resistance. Those aforementioned car manufacturing companies encompass 96.2% of Iran car market share and in fact are competitors in order to obtain more car market share and play the main role in auto industry of Iran.

Second Phase (Quantitative Study): in order to assess those factors which are clarified in first phase, the relevant questionnaire will be launched to customers who have not bought a SAIPA innovative car, purchasing instead a car of the same segment but not innovative.

The sample size will be calculated among those people who have not purchased the innovative vehicle of SAIPA Co. but have purchased vehicles from other car manufacturing companies, such as Iran Khodro Co., Modiran Khodro Co. or Kerman Khodro Co.

The sample size is determined based on Morgans' table and on Cochrane criterion, which recommends a sample size of 265 purchasers. The resistance factors are detected and grouped trough Exploratory Factor Analysis techniques, and the SEM method will provide the aforementioned impacts of these resistance factors on resistance purchasing behavior.

1.6.2. Research Questions

First Phase (Qualitative)

Research Question: What are the factors influencing on Innovation Resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?

Second Phase (Quantitative)

Main Research Question 1: What is the effect of identified factors on Innovation Resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?

Minor Research Question1-1: *What is the effect of Functional factors on Innovation Resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?*

Minor Research Question 1-2: *What is the effect of Psychological factors on Innovation Resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?*

Main Research Question2: What is the effect of identified factors on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?

Minor Research Question 2-1: *What is the effect of Functional factors on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?*

Minor Research Question 2-2: *What is the effect of Psychological factors on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?*

Main Research Question 3: What is the effect of Innovation Resistance on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?

1.6.3. Contribution

The contribution of this study is to identify the aforementioned factors that have their own impact on active innovation resistance and also on intention to buy of customers. Since Auto Industry assigns huge investment to innovation issues and the high failure of innovation projects can impose irrecoverable costs to this industry. Therefore, is of paramount importance to investigate how innovation resistance might affect behavioral attitude in order to optimize the investments in this industry.

Although the concept of resistance has been the subject of several marketing studies, the term encompasses several meanings. Consumer resistance is situational and is displayed through opposition to a situation perceived as dissonant. This kind of resistance can be directed against the products, discourses, practices and Partnerships associated with a structure of dominance (Mani & Chouk, 2018).

The constant and successful market introduction of new products is of major concern to companies throughout all industries. However, empirical research points to high failure rates of innovations, indicating that most new products fail as they are rejected by consumers due to their resistance to innovation (Heidenreich & Kraemer, 2016).

The innovation literature reports high failure rates for innovations, ranging around 50% (Castellion & Markham, 2013; Heidenreich & Kraemer, 2016). Innovations that fail represent ineffective investments that cannot generate future revenues and thus might even endanger the competitive position of companies in the long run (Heidenreich & Kraemer, 2016).

If there is a critical number of active innovation rejections in a target market, revenues from new products and services decrease significantly. Moreover new product and new service failures regularly endanger the firm's overall competiveness (Castellion & Markham, 2013).

Consequently, it can be mentioned definitely that the role of active innovation resistance is very crucial to keep it as lower as possible in order to reduce the negative impact on customers purchasing behavior for buying an innovative product and increase their intention to buy.

This research will analyze the innovation resistance in auto industry of Iran and will fill the gap of the prior works in this title in Auto industry of this part of the world, Iran that this kind of study take place in this industry for the first time in this country.

The last contribution, but very important due to its managerial implications, is the analysis of the mediation role of innovation resistance in the intention to buy these cars equipped with technological innovations.

1.7. Structure of Work

For conducting this research, two methods have been followed, quantitative (First phase) and qualitative (Second phase). No methods are considered to be better than another since each phase has its own process to move forward. In order to clarify the research methodology in brief, the Figure 1.1 illustrate the steps followed.

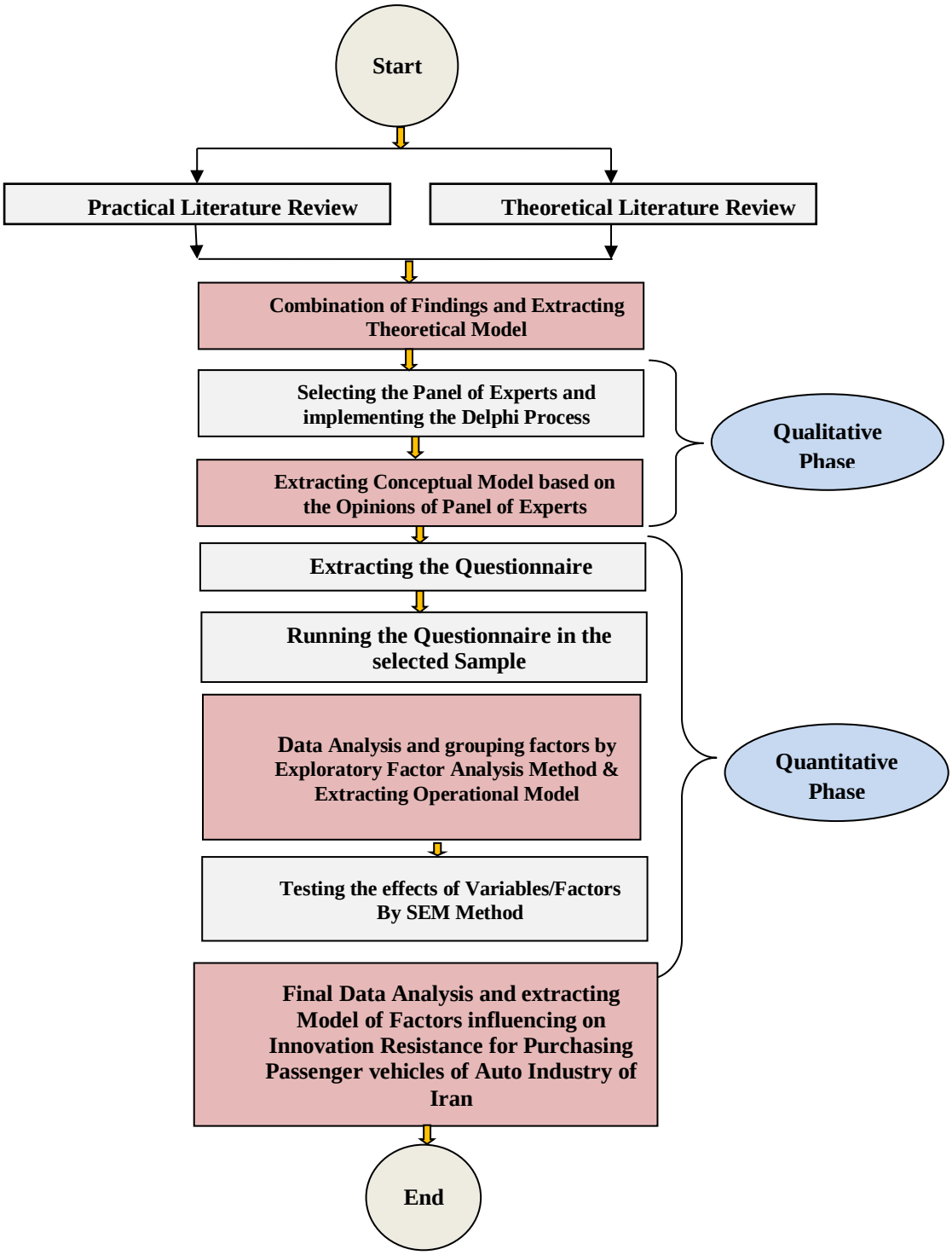


Figure 1.1. Graph of Research at one glance in Brief

1.8. Chapter Summary

In this chapter the topic of my research was introduced. The problem statement, theoretical gap, practical gap, contribution and aims and objectives of this research are discussed. It was identified that theoretical and conceptual model are required to identify what factors are the most influencing factors on Innovation Resistance.

The research aims will be examined as a conceptual model across four car manufacturing companies in Iran and finally the Model of most influencing factors on Innovation resistance will be clarified accordingly.

CHAPTER 2- LITERATURE REVIEW

2.1. Introduction

The goal of this chapter is to review the relevant previous studies to the research topic. The final purpose of this research is to render and validate a model of factors influencing active innovation resistance in auto industry of Iran and to accomplish this goal; relevant streams of research should be used.

So, in this study first the relevant literature is studied and the important factors that lead to resistance of innovations in different context are extracted. Next, we present the research objectives. Subsequently, it continues with a research methodology and preliminary results. Finally, work planned implications, and references are provided.

Briefly this chapter begins with the innovation concept and innovation decision model (Talke & Heidenreich, 2014). Then the literature review process moves to innovation resistance and its two types which are passive and active innovation resistance and its sources. In next step, the research moves to functional and psychological barriers and the next stream of the literature will be drivers of consumer resistance and literature overview drivers of consumer resistance.

In the other hand, by exploring models of Sheth, RAM and finally Kleijnen, the focused models of innovation resistance will be discussed. The research model proposed arises after reviewing these previous models (Kleijnen, Lee, & Wetzels, 2009; Ram & Sheth, 1989).

In the next step of literature review based on the prior studies, the concept of some crucial influencing factors on Innovation Resistance will be discussed in brief and finally, this chapter will end with the concept of purchase intention which is one of main construct of this research will be identified and discussed accordingly.

2.2. Innovation

Product innovation pertains to market o offerings such as new products, new services, or new programs. While denoted as product innovation, the terms ‘service’ or ‘program’ could be readily used instead. Kahn (2018) mentions understanding the innovation as Table 1.1 shows.

Table 1.1. Understanding Innovation (Kahn, 2018)

Element	Strategic focus	Strategic question	Consideration
Innovation is an **outcome**	Ends	What do you want to happen?	• Product innovation • Process innovation • Marketing innovation • Business model innovation • Supply chain innovation • Organizational innovation
Innovation is a **process**	Ways and Means	How will you make it happen?	• Innovation process • Product development process
Innovation is a **mindset**	State	What should be instilled	• Individual mindset • Organizational culture

Because innovation ranges from incremental to radical offerings, different types of product innovation are possible. Seven types of product innovations are generally recognized (Kahn, 2018).

Seven types of product innovation as mentioned by Kahn, 2018 are as follows:

1- Cost reductions: These represent a permanent change in price and do not normally have a dramatic change in the visual characteristics of a product. The aim of the cost reduction is to differentiate the product from competing products on price or ensure the product remains price competitive.(Kahn, 2018)

2- Product improvements: Enhancements that improve form or function. A product improvement will replace the original product so the original product will no longer be available to customers. Product improvements often represent those offerings labeled as ‘new and improved’ or ‘better.’ (Kahn, 2018)

3- Line extensions: New features/options added to an existing offering, which provide unique benefits and functionality that the original product or current set of product offerings does not have. (Kahn, 2018)

4- New markets: Current offerings taken to new markets with minimal changes to the product. (Kahn, 2018)

5- New uses: Original products positioned in new markets without minimal, if any, changes to the product. (Kahn, 2018)

6- New category entries: Products that are new to the company, but not new to the consumer as a category. (Kahn, 2018)

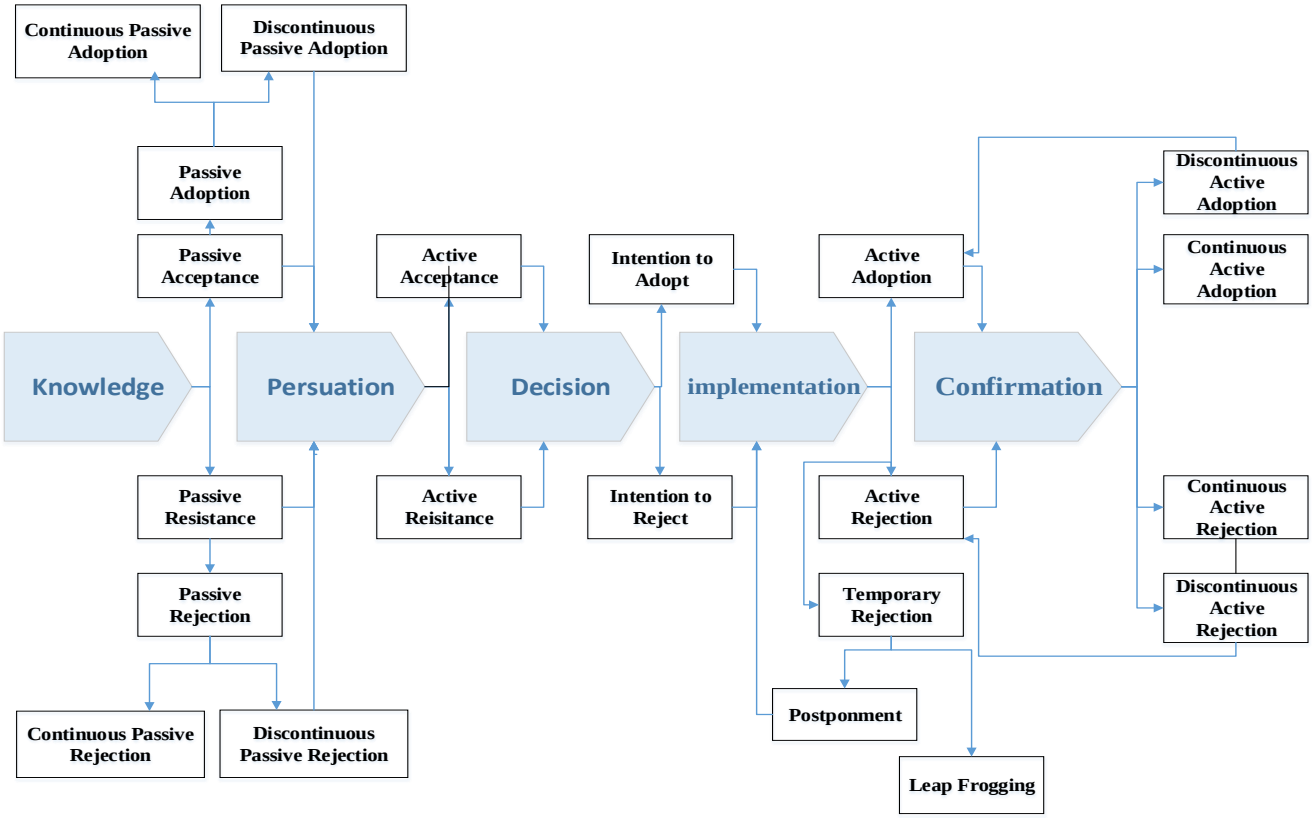
7- New-to-the-world products: Technological innovations that create a completely new market that previously did not exist. (Kahn, 2018)

An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behavior is concerned, whether or not an idea is "objectively" new as measured by the lapse of time since its first use or discovery. The perceived newness of the idea for the individual determines his or her reaction to it (Rogers, 2003a).

The same author suggests five attributes or characteristics of innovations that are perceived by customer are: (1) Relative advantage, (2) Compatibility, (3) Complexity, (4) Trialability, and (5) Observability (Rogers, 2003a).

2.3. Innovation Decision Process Model

As aforementioned, the process of innovation decision models as introduced by Rogers (2003) includes five stages: (1) Knowledge, (2) Persuasion, (3) Decision, (4) Implementation, and (5) Confirmation (Rogers, 2003b) (see Figure 2.1). These are the five steps we adapt to the consumer decision process in our setting.



0Figure 2.1. Innovation Decision Model (Talke & Heidenreich, 2014)

In the knowledge stage, consumers are exposed to an innovation, become aware of it, and gain knowledge about it (Talke & Heidenreich, 2014). Awareness should motivate them to seek further information about the innovation attributes and thereby proceed to the persuasion (Kaplan, 1999).

Then, in the persuasion stage, consumers form their favorable or unfavorable attitude toward the innovation depending on how they have evaluated the innovation, i.e., to which extent individual expectations deviate from the impression formed during information processing (Rogers, 2003a). The course of the decision process depends primarily on three contextual factors:

(1) Adopter-specific factors or the decision maker's individual characteristics, including cognitive rigidity, risk aversion, or involvement (Gatignon & Robertson, 1985; Rogers, 2003a; Wejnert, 2002).

(2) Situation specific factors that reflect the circumstances of the adoption decision, such as monetary restrictions, products already possessed, or the shopping environment (Gatignon & Robertson, 1985; Rogers, 2003a; Wejnert, 2002).

(3) Innovation-specific factors, which describe the decision maker's perceptions of the attributes of the new product, including its relative advantage, compatibility, or complexity (Gatignon& Robertson, 1985; Rogers, 2003; Wejnert, 2002).

In the decision stage, consumers refine their perception of the innovation and decide whether to adopt or reject it, the decision stage results in an intention, although not yet to concrete behavior. In the implementation stage, intentions transform into actual behavior adoption is the purchase of an innovation with at least one initial use; rejection is defined as non-purchase (Talke & Heidenreich, 2014).

In the implementation stage, behavioral components join the intentional outcomes, so that actual behavior, such as active innovation adoption or active innovation rejection, results (Rogers, 2003a; Yoh, Damhorst, Sapp, & Laczniak, 2003).

However, an intention to adopt or reject does not always lead to congruent behavior (Rogers, Medina, Rivera, & Wiley, 2005) Consumers may still be uncertain about certain innovation attributes and consequences. To improve their mental framework of the innovation, they likely engage in activities such as seeking further information, extending product trials, or getting assistance and feedback from their social network (Seligman, 2006).

Finally, in the confirmation stage, consumers seek reinforcement of their adoption or rejection behavior. They may continue, stop, or reverse their behavior if they have been exposed to conflicting information about the innovation (Talke & Heidenreich, 2014). The adoption process ends if the innovation is in use by the adopter or will not be purchased at any later time (Rogers, 2003a).

Neglecting resistance and rejection behavior that occurs prior to the persuasion stage, results in a pro-change bias, i.e., the assumption that consumers are open to change and interested in evaluating new products. However, initial resistance to change, including that sparked by an innovation, is an expected consumer response (Ellen & Bearden, 1991; Ram, 1989a) that may lead to selective exposure to or perception of information, disrupting, and perhaps even terminating, the knowledge gaining process.

When consumers reject an innovation prior to the persuasion stage, they never even consider its potential (Talke & Heidenreich, 2014). The level of initial resistance likely depends on several drivers, and it is needed to understand these factors to

overcome pro-change bias (T. Laukkanen, Sinkkonen, & Laukkanen, 2009; Ram & Sheth, 1989).

Most studies that investigate innovation failures use the concept of innovation resistance to explain why consumers reject new products (Ellen & Bearden, 1991; Ram & Sheth, 1989).

The reason for rejecting new products vary in different conceptualization. Some authors conceptualize innovation resistance as an attitude (Ellen & Bearden, 1991), others as an intention or behavior (Kleijnen et al., 2009; Szmigin & Foxall, 1998), and some others as a combination of attitude and behavior (T. Laukkanen et al., 2009; Ram & Sheth, 1989).

However, innovation resistance is universally assumed to result from negative product evaluation formed in the persuasion stage or beyond (LABAY & Kinnear, 1981; Rogers, 2003b)

Thus, innovation resistance that occurs prior to the persuasion stage is neglected adoption literature also widely acknowledges attitude–behavior discrepancies (Seiders, Voss, Grewal, & Godfrey, 2005; Sheppard, Hartwick, & Warshaw, 1988).

A positive or negative attitude toward an innovation can, although does not always, lead to aligned behavior (Chandon, Morwitz, & Reinartz, 2005; Rogers, 2003a). So consumers who were initially interested in a new product might still develop a negative attitude and reject it. So positive and negative outcomes can occur at any stage of the adoption process, such that it can be identified:

(1) Passive innovation resistance or acceptance as outcomes of the knowledge stage.
(2) Active innovation resistance or acceptance as attitudinal outcomes of the persuasion stage.
(3) The intention to reject or to adopt an innovation as intentional outcomes of the decision stage.
(4) Active rejection or adoption as behavioral outcomes of the implementation stage.
(5) Discontinuous or continuous rejection as behavioral outcomes of the confirmation stage (Talke & Heidenreich, 2014).

2.4. Innovation Resistance

Consumers' resistance has been defined as “Innovation resistance”. It is the resistance offered by consumers to an innovation, either because it poses potential changes from a satisfactory status quo or because it conflicts with their belief structure (Ram & Sheth, 1989).

An innovation may create a high degree of change in the consumers' day-to-day existence and disrupt their established routines (Ram & Sheth, 1989) like people who do not like online shopping since they think they forego the enjoyment of interacting with store personnel so they resist this kind of service due to changes in their shopping behavior since many were happy with their current mode of shopping and resented the changes posed by the innovation (Ram & Sheth, 1989).

Consumers also are interested in evaluating new products. However consumers often reject innovations without considering their potential, such that the adoption process ends before it really has begun (Talke & Heidenreich, 2014).

Innovation resistance is a relatively neglected concept in new product management as the previous studies mostly concentrated on innovation adoption and diffusion; as a result, innovation resistance used to be traditionally measured indirectly by looking at individuals’ innovativeness (Tansuhaj, Gentry, John, & Manzer, 1991).

While several authors have supported the notion of consumer resistance (Gatignon& Robertson, 1989; Ram 1987; Sheth, 1981) and implicitly or explicitly acknowledged the importance of ‘negative’ or ‘anti’ consumption (Kleijnen et al., 2009) there is little attention devoted to the through conceptualization of the concept of individual consumer resistance (Lapointe, 2005).

Innovation Resistance is not the opposite of Innovation Adoption. Adoption begins only after the initial resistance offered by the consumers is overcome. If the resistance is too high. the innovation dies and there is no adoption. resistance and adoption can coexist during the life of an innovation (Ram, 1987).

"Resistance to change may be defined as any conduct that serves to maintain status quo in the face of pressure to alter the status quo" and is associated with the degree to which individuals feel themselves threatened by change. Innovation Resistance is the resistance offered by consumers to changes imposed by innovations. Several theories in psychology explicitly deal with resistance to change (Ram, 1987).

All these theories suggest that consumers have an intrinsic desire for psychological equilibrium. Any change imposed on their behavior has the potential to disturb this equilibrium. Thus the consumer more often resist the change than going through a disturbing process of readjustment. In other words. resistance would seem to be a normal response of consumers when confronted with innovations (Ram, 1987).

The adoption and diffusion perspective examines how an innovation spreads through the market from the time of innovation while the innovation resistance perspective focuses on why consumers are unwilling to accept newness (Ram & Sheth, 1989; Tansuhaj et al., 1991).

There are many new products introduced in the market each year but only a small fraction of them are commercially successful (Kleijnen et al., 2009; Ram & Sheth, 1989). Studying innovation resistance is also important for innovation adoption because the probability of adoption is higher when the initial resistance from consumers is overcome (Ram & Sheth, 1989).

The proposed definition of innovation resistance is 'the resistance offered by consumers to an innovation, either because it poses potential change from a satisfactory status quo or because it conflicts with their belief structure' (Ram & Sheth, 1989). Such a definition is broad as it essentially defines innovation resistance as 'resistance to innovation' (Kleijnen et al., 2009).

Another drawback of such a definition is that, 'not trying the innovation' is not necessarily an indicator of innovation resistance as the initial objections toward an innovation can sometimes be overcome by offering consumers to try innovation for a certain period of time (Rogers, 2003a). Innovation resistance was further narrowed down into three distinct types of behavior: rejection, postponement, and opposition (Szmigin & Foxall, 1998).

Regarding Ram's definition, 'when consumers resist from adopting an innovation, they are exhibiting resistance to the innovation', so this resistance is behavioral and may thus be referred to as behavioral resistance' (Ram & Sheth, 1989). So based on the Ram's recommendation, a function of high risks and habit of using current product may cause behavioral resistance to innovation.

Thereafter, high volume of innovation resistance in this study refers to one of extracted factor which is high perceived risk toward using innovative vehicles and

reluctance to purchase an innovative vehicle refers to a result this factor which is one of psychological factors.

2.4.1 Passive Innovation Resistance

In general passive innovation resistance results from a consumer's predisposition to resist innovations prior to new product evaluation, active innovation resistance is an attitudinal outcome that follows an unfavorable new product evaluation (Talke & Heidenreich, 2014).

Accordingly, most research focuses on positive outcomes of the adoption process, such as innovation acceptance, the intention to adopt an innovation or adoption behavior (Rogers, 1976; Speier & Venkatesh, 2002).

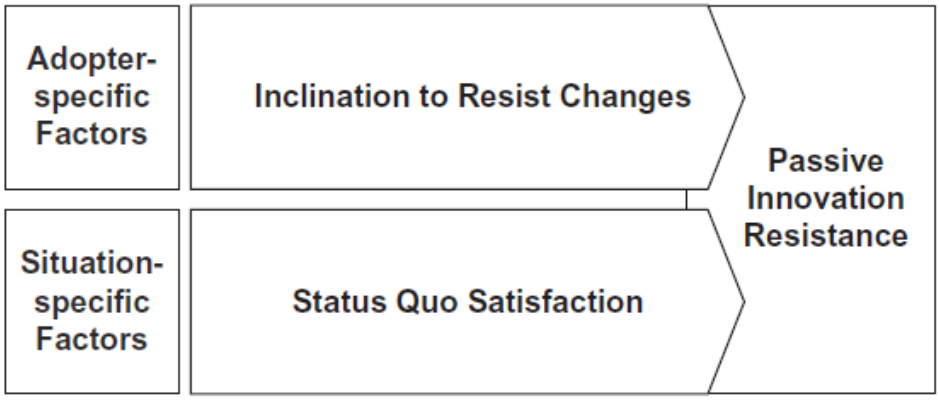


Figure 0.2. Sources of Passive Innovation Resistance(Talke & Heidenreich, 2014)

Only few authors explicitly explore anti-consumption and its manifestation as negative outcomes of the adoption process, such as innovation resistance the intention to reject an innovation, or rejection behavior (Goldenberg & Oreg, 2007; Kleijnen et al., 2009).

Innovations demand change in consumers' attitudes, intentions and behaviors and resistance to change is a common consumer response (Ellen & Bearden, 1991; Ram & Sheth, 1989). If a consumer rejects an innovation prior to evaluating its potential, any investments in later stages of decision process are wasted (Kuisma, Laukkanen, & Hiltunen, 2007). A better understanding of initial innovation resistance is crucial for helping managers develop effective measures to fuel the adoption (Talke & Heidenreich, 2014).

2.4.2. Active Innovation Resistance

Active innovation resistance is understood as an attitude that follows an unfavorable evaluation of a new product (Talke & Heidenreich, 2014). It is a deliberate form of resistance, which evolves from innovation-specific factors. Consumers shape their attitude toward an innovation on the basis of their evaluation of its attributes (Rogers, 2003a). If their perception of certain attributes does not meet their expectation, innovation-specific barriers arise (P. Laukkanen, Sinkkonen, & Laukkanen, 2008).

Based on adoption process, Active Innovation Resistance (AIR) barriers occur when a consumer valuates an innovation. According to Ram and Sheth (1989), AIR barriers can be classified into two types: functional and psychological barriers. While functional barriers are more likely to arise if consumers perceive significant changes from adopting the innovation (Ram & Sheth, 1989), psychological AIR barriers are primarily caused by psychological conflicts owing to a consumer's beliefs (Kleijnen et al., 2009).

Past research shows that arising functional and psychological barriers cause higher AIR, which will likely lead to the rejection of innovations (Heidenreich & Spieth, 2013; Kuisma et al., 2007; Wiedmann et al., 2011). As soon as these barriers exceed an adopter-specific tolerance level, consumers form a negative attitude toward the innovation (Kleijnen et al., 2009). A high level of active innovation resistance likely leads to congruent behavior (Kuisma et al., 2007) .

Consumers deliberately reject an innovation if they perceive it as functionally inadequate or conflicting with their social norms, values, and individual usage patterns (Talke & Heidenreich, 2014). Consequently, active innovation rejection describes deliberate non-purchase behavior following an unfavorable product evaluation (Talke & Heidenreich, 2014).

Several studies confirm that innovation-specific barriers affect negative attitude formation, which then can lead to non-purchase and related behaviors, such as negative word of mouth, complaints, or boycotts (Kleijnen et al., 2009; P. Laukkanen et al., 2008).

Following this notion, it is suggested that active innovation resistance results primarily from innovation-specific barriers (Talke & Heidenreich, 2014).

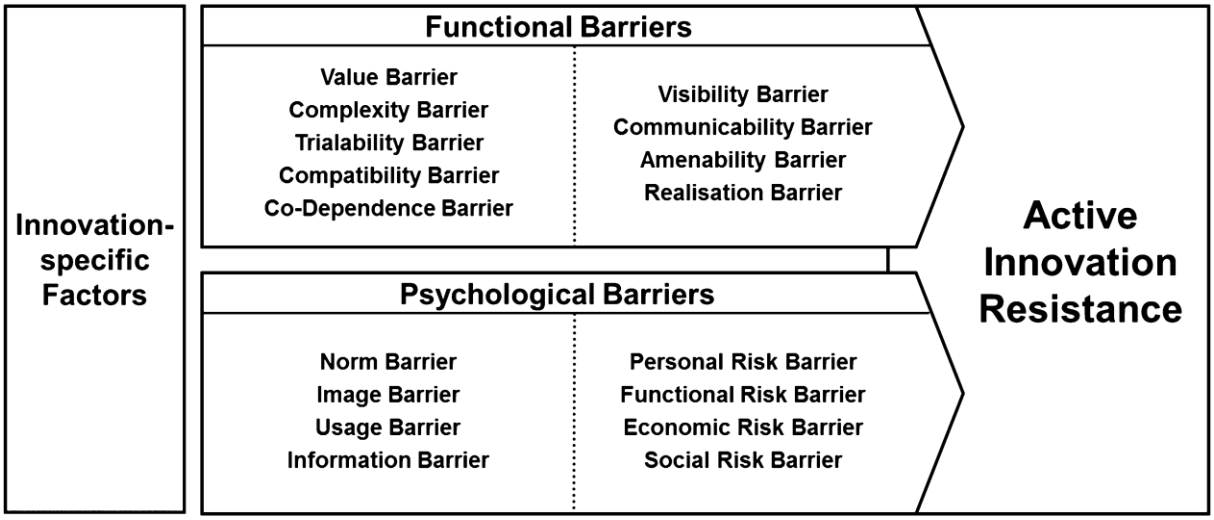


Figure 02.3. Sources of Active Innovation Resistance

As Figure 2.3 illustrates (Talke & Heidenreich, 2014), these barriers can be distinguished as functional or psychological (P. Laukkanen et al., 2008; J. Lee, Morrin, Lee, & Lee, 2010; Ram & Sheth, 1989).

Functional barriers: arise as soon as a consumer perceives any product attributes as dysfunctional or inadequate for his or her personal needs and usage expectations (Talke & Heidenreich, 2014). As Figure 2.3 illustrates some of Functional Barriers are listed below:

Value barriers refer to a perceived lack of relative advantage or superior performance by the innovation over existing alternatives (Hoeffler, 2003; Ram & Sheth, 1989). The value barriers indicate that to entice consumers to change, the value created by innovative products must be higher than that created by existing products (P. T. Chen & Kuo, 2017).

Complexity barriers: occur if an innovation is perceived as relatively difficult to understand (complexity of the idea) or use (complexity of execution) (Ram, 1989a; Rogers, 2003a).

Trialability barriers: relate to perceived difficulties in testing the innovation prior to adoption (Kuisma et al., 2007; Ram, 1989a).

Compatibility barriers: emerge if an innovation is perceived as incompatible with existent and past products, and co-dependence barriers emerge if

consumers perceive a product as depending too heavily on additional products for full functionality (P. Laukkanen et al., 2008).

Communicability barriers: reflect a perceived ineffectiveness when describing the benefits or shortcomings of an innovation to others (Moore & Benbasat, 1991; Rogers, 2003a).

Visibility barriers: emerge when consumers perceive difficulties in observing others using the innovation (Moore & Benbasat, 1991).

Amenability barriers: arise when an innovation seemingly has limited potential to be modified, updated, or tailored to specific consumer needs (Ram, 1989a; Szmigin & Foxall, 1998).

Realization barriers: occur if the time span before the benefits of the innovation become manifest is perceived as too long (Ram, 1989a).

Psychological barriers: arise as soon as the innovation conflicts with a consumer's social norms, values, or individual usage patterns, or if its usage is perceived as being too risky (Kleijnen et al., 2009; Ram & Sheth, 1989). Some of them are listed below:

Norm barriers: occur if an innovation is perceived as violating group norms, or societal and family values (P. Laukkanen et al., 2008; Ram, 1989a).

Image barriers: relate to unfavorable associations attributed to an innovation, such as its brand, manufacturer, or country of origin (Kuisma et al., 2007; Ram & Sheth, 1989).

Usage barriers: relate to the innovation's inconsistencies with past experiences that threaten to disrupt established usage patterns (Hoeffler, 2003; Ram & Sheth, 1989).

Information barriers: relate to perceived information asymmetries that make consumers uncertain of unwanted consequences (Kuisma et al., 2007).

Risk barriers: arise if consumers perceive an innovation as hazardous, such as when they fear that an innovation entails physical risks and could cause harm to them or their property, functional risks that it performs improperly and functions unreliably, economic risks such that it represents a bad value for money, or social risks because it will prompt disapproval from relevant social groups (Ram & Sheth, 1989).

People evaluate innovations in regard to product attributes like relative advantage, compatibility, complexity, trialability, and/or observability, which have a strong influence on their adoption decision (Claudy et al., 2014).

Davis in 1989 introduced technology acceptance model (TAM), which was specifically developed to explain computer usage and adoption of new information technologies.

In general, TAM provides the theoretical link between two specific beliefs, perceived usefulness (PU) and perceived ease of use (PEOU), and potential adopters' attitudes, intentions and computer usage behavior (Davis, 1989).

Again, the influence of these two motives on consumers' adoption intentions has been demonstrated across a wide range of technological innovation (J. L. Lu, Chou, & Ling, 2009; Porter & Donthu, 2006; Wu & Wang, 2005).

Further, TAM is rooted in the assumption that consumers' evaluation of product attributes results in the formation of negative or positive attitudes toward an innovation, which ultimately determines the decision whether to adopt or reject a new product or service (Claudy et al., 2014).

High failure rates of new products and services should not be surprising, as innovation in its very nature requires consumers to accept changes in price, performance, or design, or it forces people to change habits and routines, or break with entrenched norms and traditions (Claudy et al., 2014). Consumer resistance to innovation can be seen as a more specific form of people's general resistance to change (Oreg, 2003).

Ram and Sheth (Ram & Sheth, 1989) have argued that "Innovation resistance is the resistance offered by consumers to an innovation, either because it poses potential changes from a satisfactory status quo or because it conflicts with their belief structure" (Kleijnen et al., 2009).

In general, research suggests that new products and services are rejected because of barriers consumers associate with adopting an innovation (Ram & Sheth, 1989). Researchers have broadly distinguished between functional and psychological barriers that impede adoption of innovations (Kleijnen et al., 2009).

Functional barriers refer to usage, value, and risk barriers that consumers may associate with a new product or service. Consumers experience usage barriers when

an innovation conflicts with existing usage patterns (Ram & Sheth, 1989).Consumers tend to have a general preference for status quo solutions, because people generally know how successful current products are in solving their problems (Claudy et al., 2014).

One of the reasons why electric vehicles (EVs) have been met with resistance, for example, is the lack of charging stations, which leads to range anxiety, a noted reason for drivers to shun EVs (Zhang, Gensler, & Garcia, 2011). Likewise, value barriers refer to perceived performance-to price ratios of innovations, compared with existing product substitutes (Molesworth;Suortti, 2002).

The influence of value barriers on consumers' adoption decision is well understood, and studies suggest that a low performance-to-price ratio is the most cited obstacle for consumers to adopt innovations (Parasuraman & Grewal, 2000).

The present research focuses on the role of functional barriers as well psychological barriers for predicting the intention to buy an innovative passenger vehicle.

In sum, it is proposed that active innovation resistance is driven by both innovation-specific functional and psychological barriers that result from unfavorable new product evaluations (Talke& Heidenreich, 2014)

2.5. Characteristics of Innovation Resistance

First, innovation resistance affects the timing of adoption. Adopters of innovations have been classified into five categories (Rogers, 2003b):

- Innovators
- Early Adopters
- Early Majority
- Late Majority
- Laggards

In our study, it can be viewed from both lens: customer or manufacturing car provider. However, we focus mainly in the customer perspective.

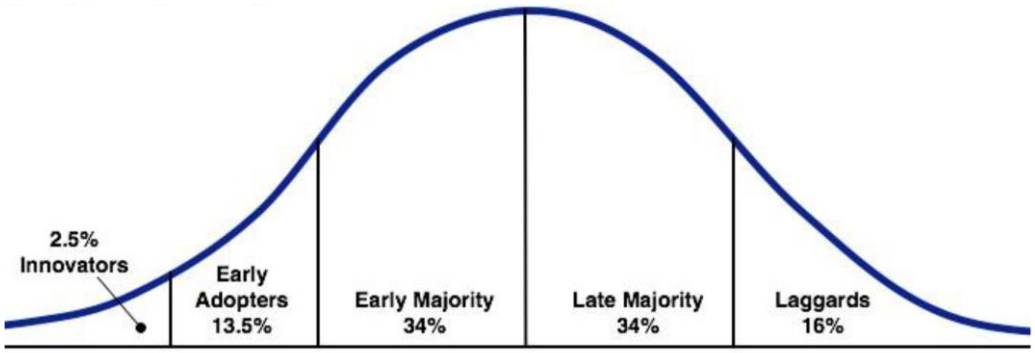


Figure 2.4. Adopter Categorization on the Basis of Innovativeness (Rogers, 2003b)

Each of these groups has a different level of resistance to the innovation, and this variation in level affects the timing of adoption (Ram & Sheth, 1989). For example, Innovators exhibit no resistance to the innovation and are the first to adopt. The Laggards, on the other hand, have such a high level of resistance that they do not adopt the product. For the other adopter categories, the resistance to the innovation breaks down over time (Ram & Sheth, 1989).

Second, innovation resistance varies in degree. Resistance exists on a continuum, increasing from passive resistance or inertia to active resistance. Consumers who are aware of an innovation may behave in one of the following ways:

- They may feel disinclined to adopt the innovation (inertia), for example, few men adopted cosmetics when they were first introduced exclusively for the male segment. For a variety of cultural reasons men were not sufficiently motivated to change their current behavior (Ram & Sheth, 1989).
- Consumers may feel that the innovation is too risky and postpone the adoption decision (active resistance), for example, microwave ovens met with high market resistance initially since consumers feared that the radiation might cause physical risk (Ram & Sheth, 1989).
- Consumers may be convinced that the innovation is unsuitable and decide to launch an attack against its adoption (very active resistance), for example, when diesel cars were first introduced, the early adopters had to cope with high diesel costs and radically new maintenance problems; these dissatisfied consumers raised such a hue and cry about their problems that they diffused resistance to the innovation through the rest of the market (Ram & Sheth, 1989).

Third, innovation resistance exists across product classes. What matters is not the product class to which the innovation belongs, but the two basic causes of resistance:

the degree of change or discontinuity brought about by the innovation, and/or the extent to which it conflicts with the consumer's belief structure (Ram & Sheth, 1989).

A highly discontinuous innovation, such as the first computer, creates a great degree of change for the consumer and is likely to encounter high resistance. Innovations based on new technologies usually create high discontinuity (Ram & Sheth, 1989).

On the other hand, a continuous innovation, such as the push-button phone, which improved on the rotary dial phone, creates hardly any change for the consumer. Yet, even such an innovation can meet with resistance for the second reason: conflict with belief structure. While the market has readily accepted push-button phones made in the United States, not all consumers have switched to the cheaper imitations made in Hong Kong, because of the lower quality that they perceive in the latter (Ram & Sheth, 1989).

2.6. The Models of Innovation Resistance

There are some proposed constructions that are useful to understand the psychology of innovation resistance.

2.6.1. Sheth's Model

Sheth (1981) researched psychology of innovation resistance and proposed two psychological constructs, which has been termed very useful in understanding the psychology of innovation resistance. These psychological constructs are: habit/behavior towards existing products and perceived risks associated with innovation adoption (Sheth, 1981).

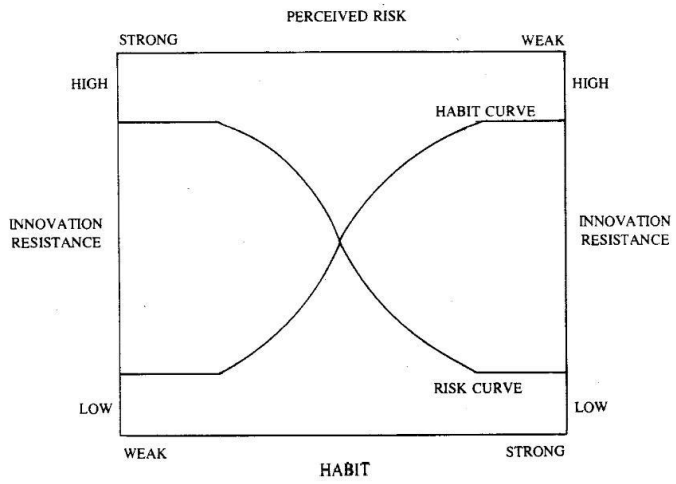


Figure 2.5. Modeling Psychology of Innovation Resistance (Sheth, 1981)

Following this model, Ram (1987) discussed innovation resistance in more details and proposed a detailed model of innovation resistance.

2.6.2. Ram's Model (Ram, 1987)

According to this model (Ram, 1987), innovation resistance can be viewed as dependent on three sets of factors: Perceived Innovation Characteristics, Consumers' Characteristics, and Characteristics of Propagation Mechanisms, where each set consists of detailed factors. Ram's model of innovation resistance is a useful tool for studying innovation resistance, and has been used most widely for assessing consumers' resistance to different innovations (Gatignon & Robertson, 1985; Wejnert, 2002)

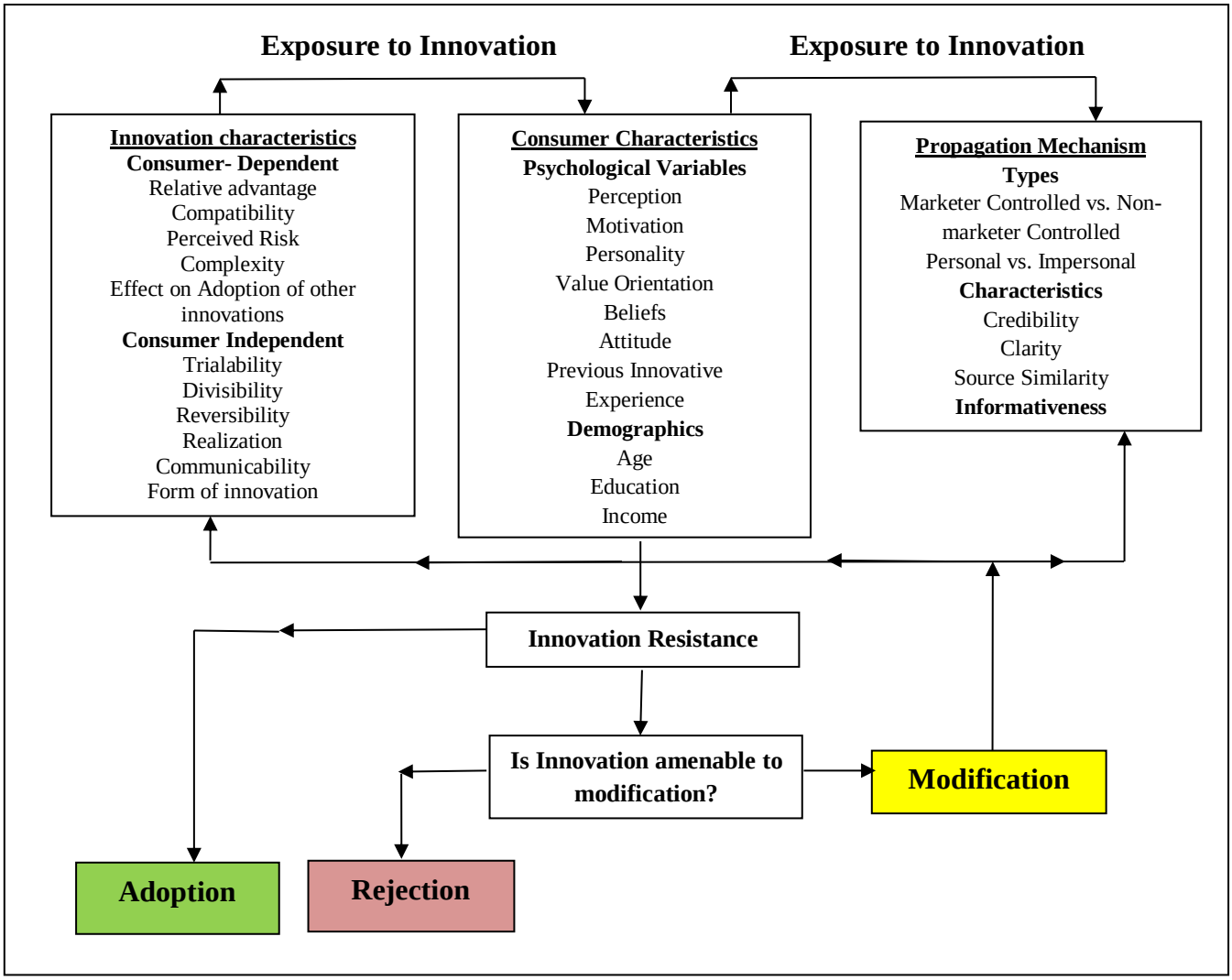


Figure 2.6. Ram's Model of Innovation Resistance(Ram, 1987).

In Ram's model of innovation resistance, the factors of innovation characteristics are: relative advantage, compatibility, perceived risk, complexity, and expectations for better products (which are raised by the problem of inhibitory effect on the adoption of other expected Innovations) (Ram, 1987).

On the other hand, the factors of consumers' characteristics are: perception, motivation, personality, value orientation, beliefs, attitude, previous innovative experience, age, education, and income. All of these factors have different nature of effect on different products and industries, as there is no evidence that these factors are all applicable and have the same effects on different products. (Ram, 1987)

2.6.3. Kleijnen Model

Kleijnen et al. (2009) model of innovation resistance is not as comprehensive as Ram's model but unlike Ram's model, which is only based on literature review, Kleijnen used qualitative techniques to develop the model.

In addition, the resistance is not considered solely as a simple obverse of adoption. Mostly in the literature, innovation resistance is considered only as 'non-adoption' which is not an appropriate approach (Kleijnen et al., 2009).

Innovation resistance in this model is considered to be a hierarchical construct manifesting itself in three forms of rejection, postponement and opposition. Two main groups of antecedents are identified for innovation resistance which are: (1) degree of change required; and (2) conflicts with the consumer's prior belief structure (Kleijnen et al., 2009).

Postponement is the weakest form of innovation resistance in such a way that consumers in general find the innovation acceptable in principle but they decided not to adopt it at that time. This type of decision is not final but is delayed (Kleijnen et al., 2009).

Kleijnen found that respondents in their focus group show postponement of innovation adoption as a result of changes in their usage pattern and economic risks. These consumers wait for the innovation to become a mainstream product and then make a final decision (Kleijnen et al., 2009).

Rejection is a stronger form of resistance than postponement and it occurs when consumers actively evaluate attributes of innovation which results in a strong

unwillingness to adopt an innovation. Rejection can occur in some examples of unproven innovations such as McDonald's 'Arch Deluxe' burger with the slogan 'Burger with grown up taste':

> 'While McDonalds positioned this new burger as a more sophisticated food product for adults, consumers did not really consider McDonalds as a provider of sophistication but of convenience' (Kleijnen et al., 2009).

Opposition is the strongest form of resistance and it occurs when consumers are so convinced that the innovation is not suitable at all and decide to launch an attack. Negative word-of-mouth is very influential for opposition against an innovation. Opposition behavior can be activated when functional and social risks are combined with a poor perceived image of innovation and a conflict with existing traditions and norms (Kleijnen et al., 2009).

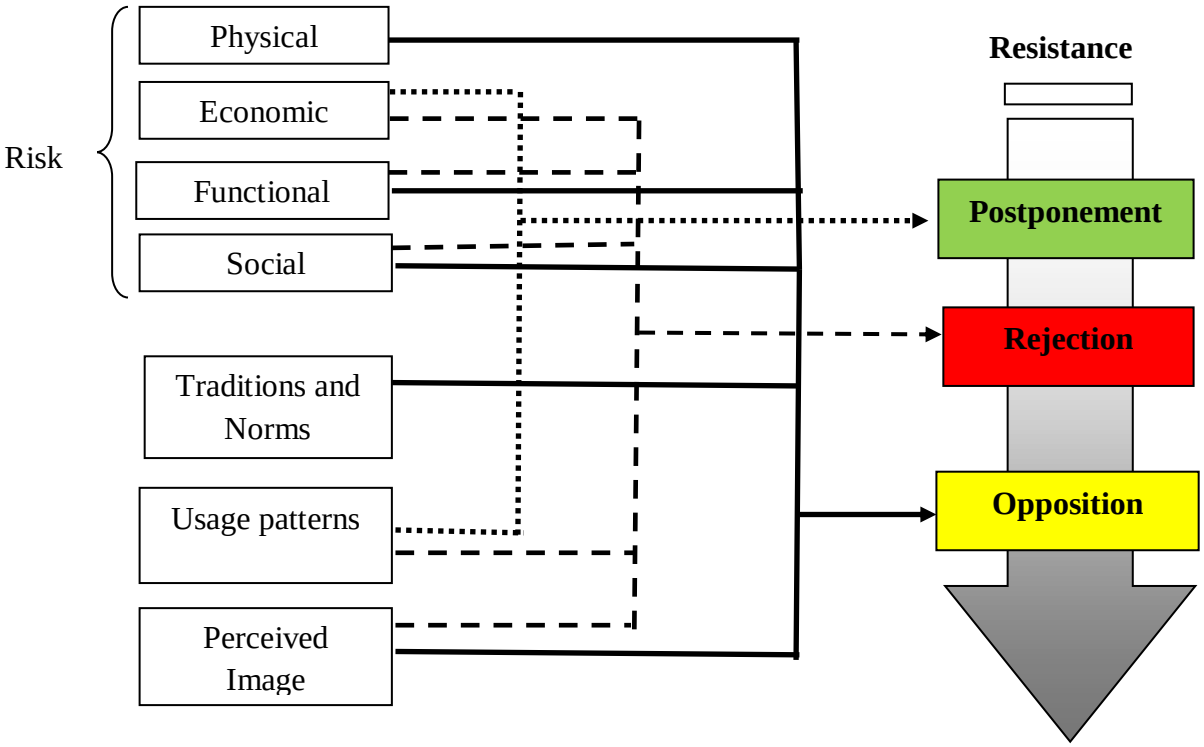


Figure 2.7. Model of innovation resistance Hierarchy (Kleijnen et al., 2009)

The data seems to suggest a somewhat hierarchical pattern among the three different types of resistance, moving from postponement, to rejection, to opposition, depending on both the amount and type of antecedent's present (Kleijnen et al., 2009).

More specifically, if an innovation is likely to change existing usage patterns and has an economic risk, then consumers are likely to resist by postponing adoption, which is the weakest form of resistance (Kleijnen et al., 2009).

However, when these two factors are combined with a functional risk, a social risk, and a poor image, consumers will resist by rejecting that innovation (Kleijnen et al., 2009).

Finally, when functional and social risks are combined with poor perceived image, a conflict with existing traditions and norms, and the perceived risk of physical harm, consumer resistance is likely to be expressed by active opposition, which is the strongest form of resistance (Kleijnen et al., 2009).

The hierarchical pattern suggests that not only do the resistance forms differ in terms of the number of antecedents, but also in their general nature. Comparing postponement to rejection, the emphasis seems to move from more basic, practical concerns in the case of postponement, to more societal concerns such as tradition and norms where rejection is concerned (Kleijnen et al., 2009).

Such issues become even more prevalent, and also include physical harm, as the resistance form becomes more pro-active (Kleijnen et al., 2009).

It seems that opposition to innovation is somehow bound up with the idea of the ‘‘citizenship” within the consumer, where consumers feel the need to be pro-active when they feel their society and associated values and norms are threatened (Kleijnen et al., 2009).

Beginning with postponement, findings from the groups which focused on this type of resistance suggested that there were two main factors that if present would lead consumers to postpone rather than adopt an innovation (Kleijnen et al., 2009)

After discussion, the definition of postponement itself was agreed to concern an active decision to not adopt an innovation at that moment in time. This decision seemed to be most influenced by the risk consumers saw in the adoption of the product (Kleijnen et al., 2009).

Moving to rejection, findings from the three groups which concentrated on this type of resistance indicate that a number of key characteristics can result in outright rejection of an innovation rather than postponement. 'Rejection' referred to the active decision to not at all take up an innovation which had been introduced to market (Kleijnen et al., 2009).

As the number and the variety of risk dimensions increases, consumers appear to be more likely to outright the innovation, rather than postpone adoption (Kleijnen et al., 2009).

More specifically, in addition to economic risk, functional and social risks are important drivers of rejection. Perceived image also plays a part in to rejection. Image serves a signaling function to make up for a lack of knowledge; the image is asset of associations related to the innovation, which in the case of resistance serves as a negative extrinsic cue, While it can be beneficial to counter-attack these negative associations with positive external cues (Shimp& Bearden, 1982).

This is not always sufficient to offset consumers' negative perceptions. Moreover, positive signals offered by the innovation literature such as word-of-mouth (Bansal & Voyer, 2000), while highly effective, are difficult to induce by the company, especially when the general level of rejection towards the innovation is high (Midgley & Dowllng, 1993).

In order to reduce risk, consumers often engage in information-seeking activities (Dholakia, 2001; Hermann & Locander, 1977). Concerning functional risk, warranties and quality assurances are often mentioned as an important tool to reduce risk perceptions (Shimp & Bearden, 1982).

Social risk perhaps implies that educating the consumer's environment (rather than the actual consumer) is most important. Diminishing social risk can be accomplished by increasing consumer confidence, which might prove to be a difficult task, or by taking a more peripheral route and changing the perceptions of the environment. Eliciting endorsements and testimonials of celebrities is a commonly suggested strategy in this regard (Kleijnen et al., 2009) like postponement, economic risk and conflict with existing usage patterns played a prominent role in consumers' decision to reject an innovation (Kleijnen et al., 2009).

Opposition, the strongest form of resistance was agreed upon in the focus groups to refer to actual active behavior directed in some way towards opposing the

introduction of an innovation. Such behaviors ranged from complaint letters, negative word of mouth, online activities, through to taking protest action against the introduction of a product (such as genetically-modified crops) (Kleijnen et al., 2009).

There are some clear differences in the pattern of antecedents to opposition to the other types of Resistance. Firstly, none of the antecedents to opposition are shared with postponement, which suggests that even innovations which are considered to be low in economic risk, and to fit well with existing routines, may still be actively opposed by consumers (Kleijnen et al., 2009).

2.7. Innovation Resistance barriers based on Claudy et al, 2014

Claudy (Claudy et al., 2014) rendered functional and psychological barriers as mentioned in Table 2.1.

Table 2.1. Innovation Resistance Factors (Claudy et al., 2014)

Resistance Factors		Definition
Functional Barriers	Usage Barriers	Degree to which an innovation is perceived as requiring changes in consumers' routines (Ram & Sheth, 1989)
	Value Barriers	Degree to which an innovations' value-to-price ratio is perceived in relation to other product substitutes (Molesworth;Suortti, 2002)
	Financial Risk Barriers	Degree of uncertainty in regard to financial, functional and social consequences of using an innovation (Herzenstein, Posavac, & Joško Brakus, 2007)
	Performance Risk Barriers	
	Social Risk Barriers	
Psychological Barriers	Tradition and Norm Barriers	Degree to which an innovation forces consumers to accept cultural changes (Herbig & Ralph, 1992)
	Image Barriers	Degree to which an innovation is perceived as having an unfavorable image (Ram & Sheth, 1989)

2.8. Innovation Resistance barriers based on Joachim et al., 2018 reserch

Joachim (Joachim, Spieth, & Heidenreich, 2018) developed *Functional barriers* as mentioned in Table 2.2.

Table 02.2. Functional Barriers (Joachim et al., 2018)

Barrier Type	Definition	Central Literature
Value barrier	Comparison of an innovation with its precursor; a consumer thinks the new product does not produce a relative advantage	Claudy et al., 2014; Mani) & Chouk, 2018; Moore & Benbasat, 1991; Ram & (Sheth, 1989
Complexity barrier	Perception that an innovation is too difficult to understand or use	Kleijnen, Ruyter, &) Wetzels, 2007; Rogers, (1983
Co-dependence barrier	Perception that the innovation as incomplete or there is a strong need to supplement it with additional parts or services	(Kuisma et al., 2007)
Trialability barrier	Perception of missing possibilities to try an innovation in general, in a specific setting or over the preferred period of time	Talke & Heidenreich,) (2014
Compatibility barrier	Perceiving that an innovation is incompatible with past or existing products	Ram & Sheth, 1989;) (Szmigin & Foxall, 1998
Amenability barrier	Believe that the innovation offers insufficient possibilities to be modified to a consumer's requirement	Ram & Sheth, 1989;) (Szmigin & Foxall, 1998; Talke & Heidenreich, (2014
Realization barrier	Evaluation that the time-span before an innovation results in a beneficial outcome is too long	Ram & Sheth, 1989;) Talke & Heidenreich, (2014
Visibility barrier	Perceived difficulties in observing the innovation in use	(Joachim et al., 2018)
Communicability barrier	Experienced difficulties in sharing an innovation's benefits or shortcomings through language use	Moore & Benbasat,) (1991; Ram, 1989a

Table 02.3. Psychological Active Innovation Resistance (AIR) barriers (Joachim et al., 2018)

Barrier Type	Definition	Central Literature
Functional risk barrier	Fear that a product could be dysfunctional or mal- functional	Talke & Heidenreich,) (2014
Personal risk barrier	Perceiving an innovation as a threat to a consumer's physical condition or property	(Joachim et al., 2018)
Economic risk barrier	Perceiving that innovation's costs are too high and the investment would be a waste of financial resources	(Kleijnen et al., 2009)
Social risk barriers	Worries that a related social group would not approve adoption	Heidenreich & Handrich,) 2015; Talke & (Heidenreich, 2014
Information barrier	Perceiving information asymmetries with the conclusion that an innovation has undesirable consequences	Garcia & Calantone,) (2002; Ram & Sheth, 1989
Image barrier	Perceiving negative impressions associated with a brand or country of origin	Kleijnen et al., 2009; T.) (Laukkanen, 2016
Norm barriers	Evaluation that the innovation is conflicting with, for instance, family values, social norms or entrenched traditions	(Joachim et al., 2018)
Usage barriers	Perceiving that consumption of innovation requires an undesirable disruption of established user patterns, workflows and routines	(Joachim et al., 2018)

So based on Joachim study consumers rejected an innovation mostly because (Joachim et al., 2018):

A. It conflicted with their values and traditions.
B. They perceived an insufficient relative advantage.
C. They perceived difficulties trying the innovation or describing it to others.

2.9. Main Innovation Resistance barriers based on previous studies

Regarding the previous studies barriers which lead to innovation resistance and encounter the innovative companies' failure in market can be grouped in functional and psychological as mentioned in following Table 2.4.

Author	Dependent variable	Product / Service	Barriers	Main Results
(Joachim et al., 2018)		Mobile industry	Functional Barriers (Value, Co-dependence, Complexity, Trialability, Compatibility, Amenability, Realization, Visibility, Communicability) &Psychological Barriers (Functional risk, Personal risk, Economic risk, Social risk, Information, Image, Norm, Usage)	The intention to adopt decreases owing to nine functional barriers (value, Communicability, trialability, amenability, compatibility, complexity, visibility, realization and co-dependence barriers) and eight psychological barriers (norm, usage, image and information barrier as well as risk barriers: economic, social, functional and personal risk). (Joachim et al., 2018)
(Claudy et al., 2014)	Innovation Resistance	Micro wind turbines	Functional Barriers (Usage, Value, Financial risk, Social risk, Performance risk)& Psychological Barriers (Tradition and Norm, Image)	Findings suggest that consumers decide to reject micro wind turbines predominantly on the basis of cost issues (Claudy et al., 2014)
(Ram & Sheth, 1989)	Innovation Resistance	NA	Functional Barriers (Usage, Value, Risk) &Psychological Barriers (Tradition, Image)	Some strategies are offered to decrease each barrier that cause customer innovation resistance, for example for decreasing usage barrier they recommend 3 strategies, 1) Developing systems Perspective, 2) Integrating the innovation with preceding activity, 3) Mandating usage through government legislation, moreover he developed strategies in order to lower Value Barrier: 1)Improving product performance, 2) Positioning the product successfully, 3)reducing price to the consumer through cost efficiency (Ram & Sheth, 1989)

Author	Dependent variable	Product / Service	Barriers	Main Results
(Kuisma et al., 2007)	Innovation Resistance	Internet Banking	Functional Barriers (Usage, Value, Physical risk, Economic risk, Functional risk, Social risk) & Psychological Barriers (Tradition, Image)	Usage and value barrier are as functional barriers for customers in order to resist internet banking and prefer to use ATM and Image, Tradition and also functional and economic risks are exerted from this research as psychological risks Although perceived risk may focus on both functional and psychological elements, it seems to arise from psychological factors within the context and not from functional factors as Ram and Sheth (1989) suggest (Kuisma et al., 2007)
(Lian & Yen, 2013)	Innovation resistance	Online shopping (Cosmetics)	Usage, Value, Risk, Tradition, Image	The risk barrier obtained the highest scores, indicating it is the fundamental problem to deal with in online shopping. The value barrier plays a critical role. The usage barrier has the lowest respondent scores (mean = 2.38), it means that users are familiar with using the Internet. Similar to the value barrier, the tradition barrier has a significant effect on non-adopter's intention. Therefore, overcoming the traditional value plays an important role when businesses want to promote their online self-services. Image barrier is related to people's image of new technology applications. So, it is suggested that companies build e WOM (electronic word of mouth) through a social community platform to establish a positive image toward buying goods online. (Lian & Yen, 2013)

Author	Dependent variable	Product/ Service	Barriers	Main Results
(T. Laukkanen, Sinkkonen, Kivijärvi, & Laukkanen, 2007)	Innovation resistance	Mobile Banking	Usage, value, risk, tradition, image for bank customers over 55 years old& Usage and value for bank customers under 55 years old)	Value barrier is the most important barrier to adoption of mobile banking for mature and younger consumers. risk and image barriers are related to mature customers; the most significant differences between mature and younger consumers' perceptions of mobile banking were related to input and output mechanisms of information, the battery life of a mobile phone, a fear that the list of PIN codes would be lost and end up in the wrong hands and the usefulness of new technology in general. This means that a greater amount of cognitive effort is involved in the adoption of an innovation by mature consumers, and therefore generates more resistance.(T. Laukkanen et al., 2007)
(P. Laukkanen et al., 2008)	Innovation resistance	Internet Banking	Usage, Value Risk, Tradition and image (Rejecters) Risk, Tradition (Opponents)	Psychological dimensions are even greater sources of resistance to internet banking than functional dimensions, especially among the opponents. The results suggest that in non-adopter group psychological barriers are higher determinants of resistance than usage and value; results also indicate the important role of the psychological risks related to perceived self-efficacy of the consumer. (P. Laukkanen et al., 2008)
(Moleswort h;Suortti, 2002)		Buying Car Online	Usage, Risk, Tradition, Image	The two most significant sources of resistance were based on usage and risk barriers arising at the evaluation and the after-sales stages of the buying process and these resulted in rejection of online buying, First, consumers are unwilling to commit themselves to a purchase without direct product experience. Secondly, the uncertainty regarding the availability and

				quality of servicing and after-sales support was a significant source of perceived risk. Both these issues have significant managerial implications for the online automotive sector and suggest the need for a 'clicks-and mortar' strategy (Molesworth;Suortti, 2002)
(Kleijnen et al., 2009)			Traditions and norms, existing usage patterns, perceived Image, information overload, Physical risk, Economic risk, Functional risk, Social risk	Just under 2% of all the quotes from all the groups related to the 'information overload' antecedent, leading to the removal of information overload from the set of antecedents to resistance the respondents, Product usage patterns were the subject of 24%of quotes, perceived image 21%, and traditions/norms 12%, By far the most common antecedent discussed was risk, with 41%of quotes relating to this antecedent. The most commonly-mentioned type of risk was functional, with economic risk also popular. By contrast, physical and social risks were discussed only sporadically (Kleijnen et al., 2009)

Table 2.4. Main innovation Resistance (AIR) Barriers

All barriers fond in previous Table could be split into two types: functional and psychological. Somehow, the first type are related to the product in itself, while the second type is related to the personality of the consumer.

2.10. Some Crucial influencing factors on Innovation resistance based on Priors Works; In Brief

Based on the previous works, the important factors influencing innovation resistance can be briefly mentioned as follows in Table 2.5. Only functional and psychological barriers are considered in the model, due to the fact that are the more relevant according to previous literature.

Table 2.5. Influencing factors on Innovation resistance based on Priors Works

Barrier Type	Factors	Definition	Literature
Functional	**Complexity**	Perception that an innovation is too difficult to understand or use	(Kleijnen et al., 2007; Ram, 1989a; Rogers, 2003a)
	Trialability	Difficulties in testing the innovation prior to adoption	(Kuisma et al., 2007; Ram, 1989a)
	Compatibility	An innovation is incompatible with existent and past products	(P. Laukkanen et al., 2008; Talke & Heidenreich, 2014)
	Co-Dependence	Innovation is incomplete and there is need to supplement it with additional parts or service	(P. Laukkanen et al., 2008; Talke & Heidenreich, 2014)
	Visibility	Consumers perceive difficulties in observing others using the innovation	(Moore & Benbasat, 1991; Talke & Heidenreich, 2014)
	Communicability	Ineffectiveness when describing the benefits or shortcomings of an innovation to others	(Moore & Benbasat, 1991; Rogers, 2003a)
	Amenability	An innovation seemingly has limited potential to be modified, updated, or tailored to specific consumer needs	(Ram, 1989a; Szmigin & Foxall, 1998)
	Realization	The time span before the benefits of the innovation become manifest is perceived as too long	(Ram, 1989a; Talke & Heidenreich, 2014)
	Perceived risk	Disruption of routine behavior and have higher levels of perceived risk associated with them	(Ram, 1989a)
	Relative advantage	An innovation may not be in the form of economic gain or in the form of cost savings	(Gatignon & JEAN-MARC XUEREB, 1997; Rogers, 2003a)
	Divisibility	An innovation cannot be attempted in stages	(Ram, 1989a)
	Reversibility	An innovation that does not allow the consumer to be able to discontinue adoption of the innovation (at least temporarily),	(Ram, 1989a)
	Value	Perceived lack of relative advantage or superior performance by the innovation over existing alternatives or even the degree to which an	(Hoeffler, 2003; Ram & Sheth, 1989)(Molesworth;Suortti, 2002)

Barrier Type	Factors	Definition	Literature
		innovations' value-to-price ratio is perceived in relation to other product substitutes	
	Originality	Consumer does not perceive the innovation as new or as unique as previous offerings	(Gatignon & JEAN-MARC XUEREB, 1997; S. Lee, Ha, & Widdows, 2011; Li, Zhang, & Wang, 2014; Moldovan, Goldenberg, & Chattopadhyay, 2011)
Psychological	**Personal/ Physical risk**	Perceiving an innovation as a threat to a consumer's physical condition or property or it concerns that the innovation might be harmful, unhealthy of cause injury	(Joachim et al., 2018; Talke & Heidenreich, 2014)(Bredahl, 2001; Ganiere, Chern, Hahn, & Chiang, 2004; Oreg, 2003; Ram & Sheth, 1989; Saba, Rosati, & Vassallo, 2000)
	Social risk	It prompts disapproval from relevant social groups	(Ram & Sheth, 1989; Talke & Heidenreich, 2014) (Fain & Roberts, 1997; Ram & Sheth, 1989; Woodside & Biemans, 2005)
	Economic risk	It represents a bad value for money or it concerns that the innovation will be a waste of economic resources	(Ram & Sheth, 1989; Talke & Heidenreich, 2014 ;Kleijnen et al., 2009)
	Functional Risk	Fearing that a product could be dysfunctional or mal-functional	(Joachim et al., 2018; Ram & Sheth, 1989; Talke & Heidenreich, 2014)(Kleijnen et al., 2009; Ram & Sheth, 1989; Szmigin & Foxall, 1998; Woodside & Biemans, 2005)
	Usage	Innovation's inconsistencies with past experiences that threaten to disrupt established usage patterns	(Hoeffler, 2003; Ram & Sheth, 1989) (Herbig & Ralph, 1992; Szmigin &

Barrier Type	Factors	Definition	Literature
			Foxall, 1998)(Mani & Chouk, 2018; Oreg, 2003)
	Norms	An innovation is perceived as violating group norms, or societal and family values	(P. Laukkanen et al., 2008; Ram & Sheth, 1989)(Herbig & Ralph, 1992)
	Information	Perceiving information asymmetries with the conclusion that an innovation has desirable consequences	(Kuisma et al., 2007; Talke & Heidenreich, 2014) (Goldenberg & Oreg, 2007; Herbig & Ralph, 1992; Molesworth;Suortti, 2002)
	Image	The innovation's identity (from its origin) like the product category, brand, or the country of origin	(Kuisma et al., 2007; Ram & Sheth, 1989)
	Attitude	The amount of resistance that Consumer offers to an innovation, consumer desires to maintain or enhance self-prestige	(Ram, 1989a)
	Personality	Personality traits such as self-confidence and dogmatism play an important role in how consumers react to innovations	(Ram, 1989a)
	Perception	We have already seen how the consumer's perception of the innovation characteristics affects resistance. Unless the consumer perceives the need for the innovation. Consumer is likely to resist it.	(Ram, 1989a)
	Motivation	If the consumer is not quite content with the current routine. And the innovation threatens to disrupt established usage patterns. then he is likely to resist the innovation	(Ram, 1989a)
	Value Orientation	Consumer does not have the superior performance by the innovation	(Ram, 1989a)
	Previous Innovation Experience	Bad Previous experiences that customer has based on innovative products	(Ram, 1989a)
	Tradition	An innovation requires a customer to deviate from established traditions	(Ram & Sheth, 1989)
	Usefulness	The consumer's perception that a product or service does not provide a benefit that fulfills his/her needs	(Henard & Szymanski, 2001; S. Lee et al., 2011; Li et al., 2014;

Barrier Type	Factors	Definition	Literature
			Moldovan et al., 2011)
Personal	**Age**	Age of the consumers	(Ram, 1989a)
	Income	Income of consumers	(Ram, 1989a)
	Education	Relevant education of consumer	(Ram, 1989a)

2.11. Purchase Intention

Purchase intention is a consumer's objective intention toward a product (D, D, Spears, & Singh, 2012) purchase intention as a consumer's conscious plan or intention to make an effort to purchase a product. This study thus suggests that purchase intention is a consumers' willingness to buy a given product at a specific time or in a specific situation (L. Lu, Chang, & Chang, 2014).

The Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) propose that consumer attitudes will directly affect their behavioral intention, which in turn will influence purchase behavior (L. Lu et al., 2014).

Since purchase intention increases when prices are fair, even when price is high, marketers should focus on promoting and creating the perception of fair price in their products and brands. Fair price should be clearly communicated to consumers through diverse channels, such as advertising and public relations campaigns. (Son & Jin, 2019).

Second, since the moderating effects of price fairness were found to differ based on consumer brand familiarity levels, marketing strategies should be applied with such discernment in mind. Consumers with high brand familiarity are likely to purchase high-priced products when the price is fair; therefore, marketers should put effort into educating consumers about their products and brands, thereby helping consumers establish brand familiarity. Offering opportunities for consumers to experience brands and products before launching products for instance, by organizing a jean fitting trial, presenting look books or offering trial services can increase brand familiarity. Finally, this study found that the moderating effect of consumer vanity was present only among consumers with low brand familiarity. High prices resulted in purchase intentions for consumers with high vanity only when they were less familiar with the

brand. Thus, emphasizing the image of vanity (associating high prices with luxury, self-achievement and success) may be effective for consumers with low brand familiarity (Son & Jin, 2019).

Perception of price and the age of consumers has made a significant contribution to explain willingness to buy a new type of vehicle (Junquera, Moreno, & Álvarez, 2016). One of important consumer characteristics which can lead to intention to buy a new product is customer innovativeness, which could be defined as need for variety, search for new information to purchase of new products (Plotkina& Munzel, 2016).

The intention to purchase the new product differs across product categories: products with more credence/ experience/ search qualities will have an increasing level of purchase intention (Plotkina& Munzel, 2016).

2.12. Research Hypothesis

Based on the above literature review and barriers influencing customer innovation resistance the following hypothesis will test the effect of Functional and Psychological Factors on Innovation resistance and also on Intention to buy and finally the effect of Active Innovation Resistance on Intention to buy. In order to prove these hypotheses, the SEM method will be tested accordingly.

Hypothesis 1: Functional Barriers have the positive and significant effect on Innovation resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

Hypothesis 2: Psychological Barriers have the positive and significant effect on Innovation resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

Hypothesis 3: Functional Barriers have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

Hypothesis 4: Psychological Barriers have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

Hypothesis 5: Active Innovation Resistance has the Negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

2.12.1. Functional Barriers

The characteristics of an innovation, as perceived by the consumer, determine the amount of resistance generated (Ram, 1987).

After reviewing relative literature and based on Rams' models and also the questionnaire delivered to panel of expert by Delphi method, the conceptual model is rendered based on Functional and psychological barriers as the main barriers for consumer resistance for purchasing innovative passenger vehicles and has been extracted seven important factors which have the most influence on Active innovation resistance: Trialability, Co-dependence, Visibility, Realization, Relative Advantage, Value and After Sales Services.

As Mani in 2018 (Mani & Chouk, 2018) examines three additional types of barriers such as technological vulnerability barriers, ideological barriers and individual barriers. His research on resistance to innovation generally uses the Ram and Sheth model (Ram & Sheth, 1989) as a theoretical framework (Antioco & Kleijnen, 2010; P. Laukkanen et al., 2008; T. Laukkanen, 2016). By applying the five original barriers: usage barrier, value barrier, risk barrier, tradition barrier and image barrier (Mani & Chouk, 2018)

1) Trialability

Which is difficulties in testing the innovation prior to adoption (Kuisma et al., 2007; Ram, 1989a) Trialability of an innovation relates to how easily the innovation can be tried by the consumer prior to adoption, and impacts on the perceived risk associated with the innovation (H. Chen, 2018; Claudy, Garcia, & O'Driscoll, 2015a; Joachim et al., 2018; Kuisma et al., 2007; T. Laukkanen, 2016; Mani & Chouk, 2018; Molesworth, 2001)

If, for instance a product based on an entirely new technology cannot be tried by the consumer prior to purchase, and then the consumer is likely to perceive a high level of risk in purchasing the product. on the other hand, if the consumer has a successful trial with the product, the risk associated with the product is likely to decrease, so it

can be mentioned that the lower the Trialability of an innovation, the higher the innovation resistance (Claudy et al., 2014; Joachim et al., 2018; Mani & Chouk, 2018; Ram 1987).

2) Co-Dependence

Innovation is incomplete and there is need to supplement it with additional parts or service (P. Laukkanen et al., 2008; Talke & Heidenreich, 2014) so the higher co-dependence of an innovation the higher the innovation resistance (Joachim et al., 2018).

3) Visibility

Consumers perceive difficulties in observing others using the innovation (Moore & Benbasat, 1991; Talke & Heidenreich, 2014). So the higher visibility of an innovation the higher innovation resistance (Joachim et al., 2018; Molesworth, 2001).

4) Realization

Realization is how soon the consumer expects to receive the benefits from the innovation, so the lower the realization of an innovation, the higher the innovation resistance (Joachim et al., 2018; Mani & Chouk, 2018; Ram 1987.; Talke & Heidenreich, 2014).

5) The Relative Advantage

The relative advantage of an innovation may be in the form of economic gain or in the form of cost savings (Ram 1987). The costs that are saved could be either financial, such as investment costs or social, such as ridicule, ostracism or expulsion from peer groups (Claudy, Garcia, & O'Driscoll, 2015b; Ram 1987, n.d.).

The innovation could also provide improved performance at comparatively lower costs, in other words, higher "value." If the Innovation provides a low relative advantage over existing substitutes (or, in fact, provides higher relative disadvantage), consumers are more likely to resist it. So the higher perceived relative disadvantage, the higher innovation resistance (Ram, 1987).

6) Value

Perceived lack of relative advantage or superior performance by the innovation over existing alternatives (Claudy et al., 2015b; Hoeffler, 2003; Ram & Sheth, 1989). Molesworth and Suortti believe that also value can be defined as the degree to which an innovations' value-to-price ratio is perceived in relation to other product substitutes (Molesworth and Suortti, 2002). Thereafter, the lower value of the innovation, the higher is the innovation resistance by customers.

7) After Sales Services

Innovation resistance, especially active resistance, results primarily from functional and psychological barriers (Ram, 1989b; Talke & Heidenreich, 2014).

Functional barriers arise when consumers consider product attributes as inappropriate or insufficient for their personal expectations, whereas psychological barriers arise when the innovation conflicts with consumers' social norms, values, or usage Patterns (Talke & Heidenreich, 2014).

Both the functional and psychological dimensions of barriers are considered important contributors to innovation resistance (Talke & Heidenreich, 2014).

Prior research has shown that innovation resistance results primarily from functional and psychological barriers, Functional barriers appear when perceived functional attributes of an innovation do not fulfil consumers' ideal expectations. Psychological barriers emerge when perceived attributes of consumers (Talke & Heidenreich, 2014).

Leading manufacturing companies recognize the importance of after-sales, both in generating significant revenues and in achieving customer satisfaction. However, relatively little is known on how companies' 'package' after-sales services for their customers and how it is evaluated during New Product Development (NPD).

To address this gap, six in-depth case studies were conducted in leading companies in a range of B2B and B2C sectors, from airliners to kitchen equipment. In each company, interviews were conducted with managers, products and key documents were inspected and this data was triangulated (Szwejczewski, Goffin, & Anagnostopoulos, 2015).

Since after sales services was a suggested factor by panel of experts which has a high influence on active innovation resistance so it can be enumerated that low after sales services can make high innovation resistance by customers. So, based on the

aforementioned factors which represent functional barriers, the H1 can be rendered as follows:

Hypothesis 1: Functional barriers have the positive and significant effect on Innovation resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

2.12.2. Psychological Barriers

Psychological barriers are discussed if an innovation is perceived as being in conflict with a consumer's beliefs (Kleijnen et al., 2009). For instance, psychological barriers play a key role concerning the assessment of genetically modified food (Ganiere et al., 2004; Joachim et al., 2018a).

While adoption decreases with higher perceived risk levels, providing information is outlined as a possibility to overcome information asymmetries and, subsequently, a way to increase acceptance (Ganiere et al., 2004; Klerck;Sweeney, n.d.).

Likewise, usage barriers are thought to show the highest differences between non-adopter groups (Lian & Yen, 2013). Economic risk, functional risk, usage, image previous innovation experience and finally usefulness of innovation underline the negative effects of psychological barriers on innovation adoption (1999, n.d.; Claudy et al., 2015b; Joachim et al., 2018; Kleijnen et al., 2009; Ram & Sheth, 1989; Yoon & Lee, n.d.).

So based on the literature review and also running the Delphi model and distributing questionnaire among 13 people which are the managers and high ranking experts of auto industry of Iran the 6 factors are extracted as follows for psychological barriers as follows: economic risk, functional risk, usage, image, previous innovation experience and usefulness. Thereafter, psychological barriers positively affect the Innovation resistance (Joachim et al., 2018):

1- The economic risk barrier increases the innovation resistance.
2- The functional risk barrier increases the innovation resistance.
3- The usage barrier increases the innovation resistance.
4- The image barrier increases the innovation resistance.
5- The previous innovation experience barrier increases the innovation resistance.
6- The usefulness barrier increases the innovation resistance.

Therefore, next hypothesis is posed:

Hypothesis 2: Psychological barriers have the positive and significant effect on Innovation resistance for purchasing innovative Passenger Vehicles in Automotive

Functional barriers negatively affect the intention to buy (Joachim et al., 2018):

1- The Trialability barrier decreases the intention to buy.
2- The co-dependence barrier decreases the intention to buy.
3- The visibility barrier decreases the intention to buy.
4- The realization barrier decreases the intention to buy.
5- The relative advantage barrier decreases the intention to buy.
6- The value barrier decreases the intention to buy.
7- The after sales services barrier decreases the intention to adopt.

Hypothesis 3: Functional barriers have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

Psychological barriers negatively affect the intention to buy (Joachim et al., 2018):

1- The economic risk barrier decreases the intention to buy.
2- The functional risk barrier decreases the intention to adopt.
3- The usage barrier decreases the intention to buy.
4- The image barrier decreases the intention to adopt.
5- The previous innovation experience barrier decreases the intention to buy.
6- The usefulness barrier decreases the intention to buy.

Hypothesis 4: Psychological barriers have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

As above mentioned factors, the assessment of innovation rejection follows a process perspective (Rogers, 2003a). Active innovation resistance negatively influences the intention to adopt an innovation and, subsequently, the behavioral outcome (Talke & Heidenreich, 2014).

Hypothesis 5: Active Innovation Resistance has the Negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

Commonly referring to theory of planned behavior or theory of reasoned action that the intention to buy influences the behavioral outcome (Lian & Yen, 2013; Westaby, 2005).

Further, active innovation resistance (AIR) effect on the intention to buy. For instance, Heidenreich and Spieth (2013) have shown in a large-scale study that the intention to adopt strongly decreases with higher AIR levels (Heidenreich & Spieth, 2013). Likewise, as Bredahlin (2001) argues that purchase intention is strongly related to product-specific attitudes in the context of the genetic modification of food (Bredahl, 2001).

In this context, AIR encompasses two types of product-specific adoption barriers: functional and psychological barriers (T. Laukkanen, 2016; Ram, 1989a). In addition, the literature outlines their dominant negative effects on an innovation's adoption, for instance, significant negative effects of value barriers in the context of internet and mobile banking (Antioco & Kleijnen, 2010; T. Laukkanen, 2016) or of Trialability barriers in high-cost purchases (Molesworth;Suortti, 2002). These results lead us to propose that product-specific functional barriers decrease the intention to buy.

Active innovation resistance has been considered as a fundamental factor of innovation rejection and is traditionally related to the adoption barriers that foster negative attitude against new product. (Joachim et al., 2018).

However, companies are facing large number of market introduction failures. Additionally, research investigating major driver of these failures and customer resistance to innovation is surprisingly scarce. Thus, the identification of the causes of product failure is a central challenge for managing a firm's innovation activities(Joachim et al., 2018).

Innovation is necessary for growing and developing organizations. It is a process that has uncertain results, and it may have negative influences for company’s reputation, competitiveness and its brand equity, due to the fact that consumers might resist innovation adoption.

2.13. The Conceptual Model

Based on the Literature review and after running the first questionnaire (Appendix A) among panel of experts and gathering information based on Delphi model, the relative conceptual model is rendered in Figure 2.8.

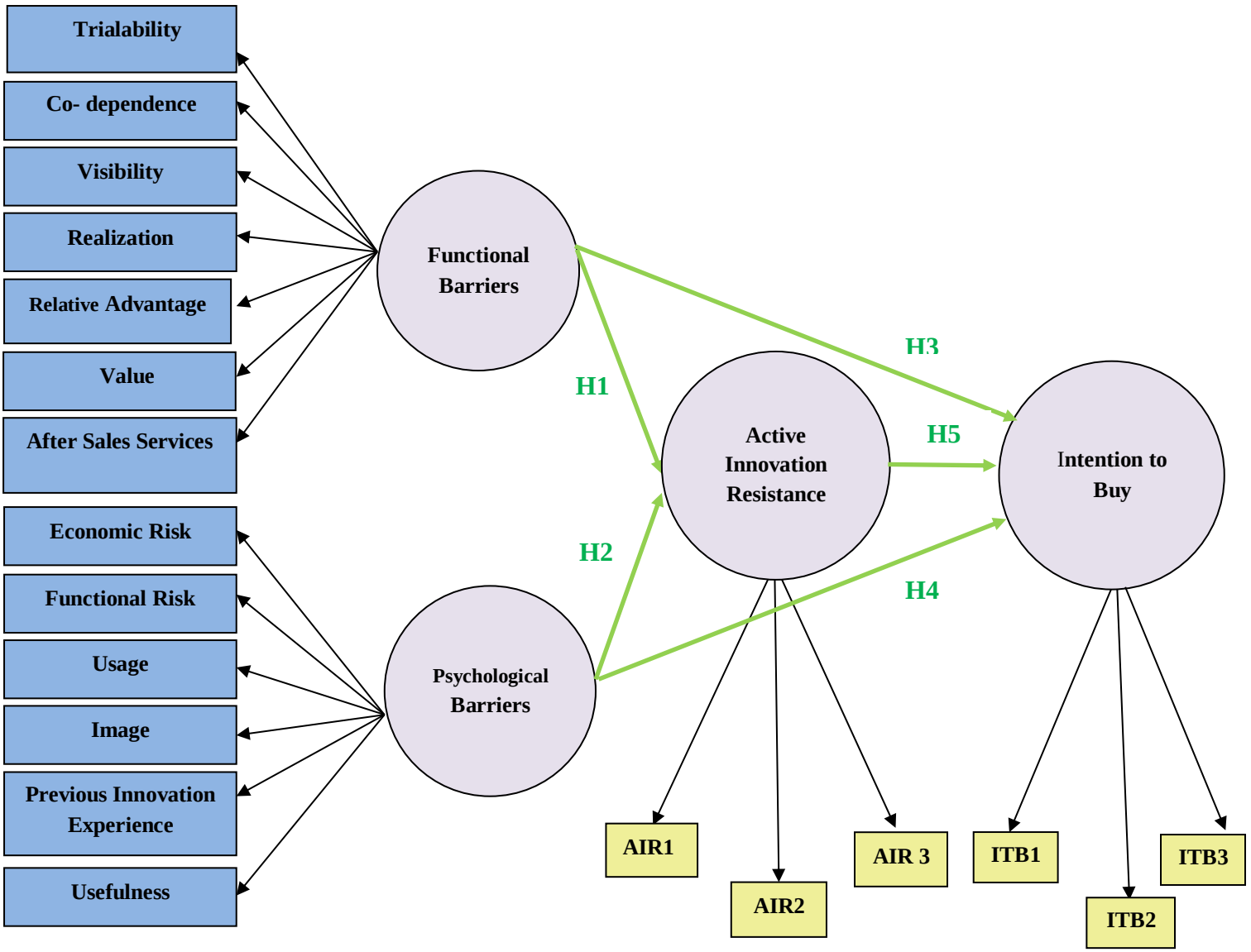


Figure 2.8. The Conceptual Model

In previous section have been included all items related to the barriers. Here are attached the items related to the dependent constructs of the model (which will be explained in detail in next sections):

The conceptual model of Innovation Resistance is set in the contest of functional and psychological constructs which are including some factors that any variation in each of these can have influence on Resistance. The influence of these factors is addressed in this research.

CHAPTER 3- METHODOLOGY

3.1. Introduction

This research determines the triggers which induce car manufacturing companies to identify the factors influencing the innovative resistance and provoke their customers and find factors which are essential for their customer resistance, regarding this issue, the methodology of this research can be carried out as is mentioned in in following graph.

3.2. Graph of Research Methodology in Details

In order to clarify the research methodology in details the Figure 3.1 illustrates the steps followed.

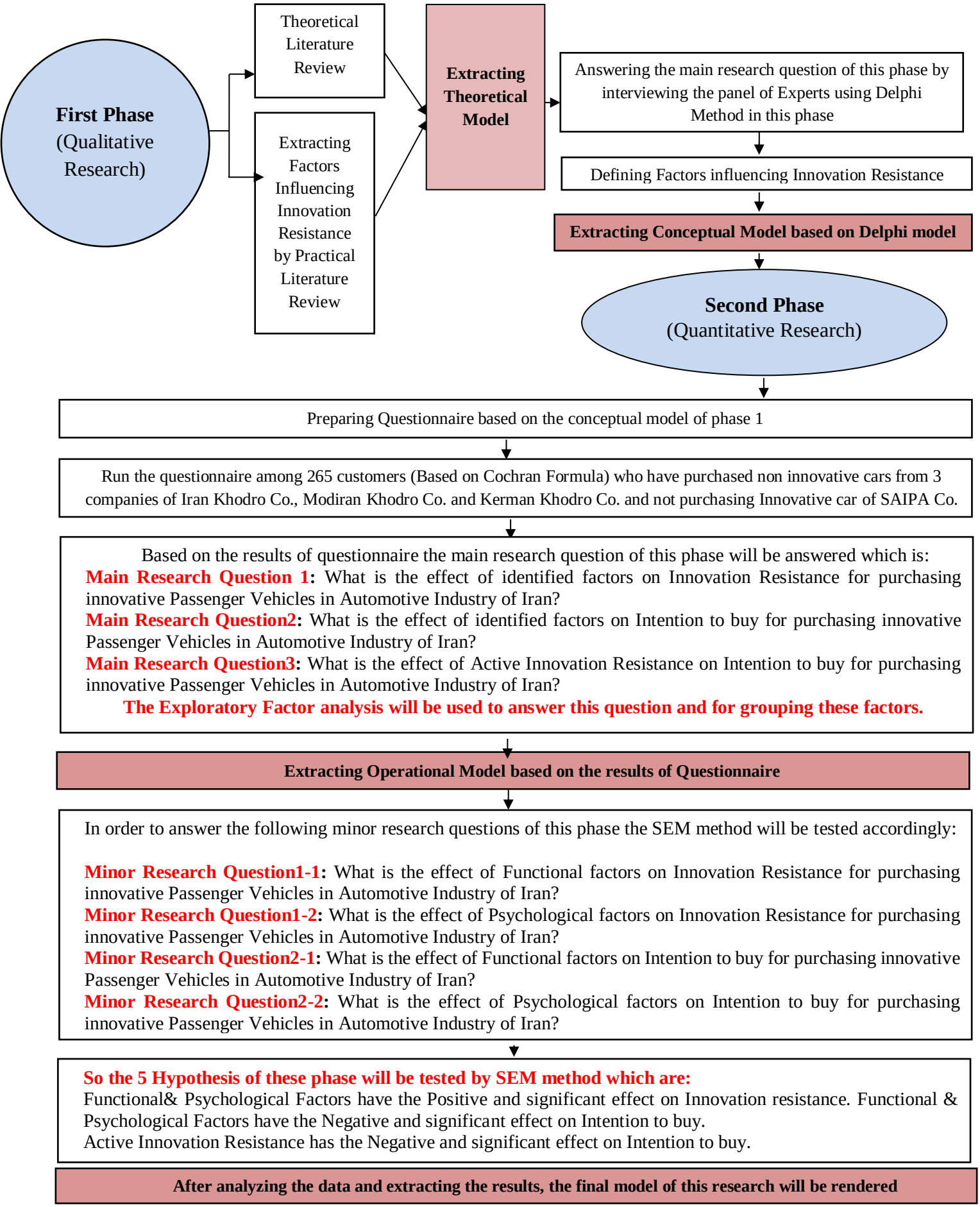


Figure 3.1. Graph of Research Methodology (detailed)

3.3. Research Methododlogy explantion

Since the method of this research is Sequential Exploratory Mixed Method, in order to reply the research question of first phase (Qualitative), the first phase of research will be conducted as follows.

3.3.1. The First Phase of Research (Qualitative Phase)

Based on the practical and theoretical literature review and combining of findings and extracting theoretical model, the 33 factors are finalized and classified in groups of functional, psychological and personal barriers as mentioned in Appendix A (Table8.1). The list was extracted from the analyzed literature, after discarding some close or redundant items.

Selecting the panel of experts and implementing the Delphi method will lead the study to extracting the conceptual model based on the opinion of the panel of expert's ideas in two rounds of running the questionnaire by Delphi. So the first phase of this research will take place as follows.

Since the first of research is qualitative study, it consists a literature review and a set of interviews to a panel of experts encompassed by top managers of sales, export, engineering and finally R&D departments of four car manufacturing companies of Iran (SAIPA Co., Iran Khodro Co., Kerman Khodro Co., and Modiran Khodro Co.).

Those aforementioned car manufacturing companies encompass 96.2% (SAIPA Co. with 43.3%; Iran Khodro Co. with 43.9% and Kerman Khodro and Modiran Khodro both with 9%); of Iran car market share, and in fact these companies are playing the main role in producing Completely Built Up (CBU) Vehicles and are competitors to sell their car in Iranian Market are selected to run first part of thesis and get the most important factors influencing on active innovation resistance. There is no other CBU vehicles manufacturers company in Iran, which made me to select just these car manufacturing companies.
A brief description of these four companies is mentioned as follows.

SAIPA Co.:
Is a car manufacturer headquartered in Tehran . The SAIPAC (an acronym for the French **S**ociété **A**nonyme **I**ranienne de **P**roduction des **A**utomobiles **C**itroën) was established in 1965 as with

75%, Iranian ownership, to assemble Citroëns under license for the Iranian market. It changed its name into SAIPA (**S**ociété **A**nonyme **I**ranienne de **P**roduction **A**utomobile) in 1975 when the Iranian state withdrew from the company. Its products in recent years were mostly under-licensed Korean cars and its own engine and range of cars. The main subsidiaries of SAIPA Group are Saipa Diesel, Pars Khodro and Zamyad Co. and more than 95 subsidiaries for producing and supplying spare parts and developing relevant services for supporting after sales services.

Kerman Khodro Co.:

The Kerman Group started its activities in the field of importation of various models of Daewoo vehicles on January of 1990, after prominent welcome by customers, it absorbed foreign investment and took position in the cycle of vehicle production, and it executes vehicle production design in Province of Kerman, Iran.

Executive operation of this project was started in 1993 and its result was creating various companies in the field of production and assembly of vehicles.

Modiran Vehicle Manufacturing Co. (MVM):

It is an Iranian automobile company, makes Chery QQ3 that called the MVM 110. MVM is a subsidiary of Kerman Khodro, an Iranian assembler of Volkswagens that also used to assemble a version of the Daewoo Matiz for the local market.

The Matiz had been assembled by Kerman Khodro since the year 2000 in a joint venture with the South Korean Daewoo Company. However the crisis at Daewoo Motor in South Korea resulted in a take-over by the American General Motors corporation which then stopped supplying CKD kits to the Iranian company due to U.S. sanctions against the government of Iran for claims about the Iranian state sponsoring terrorism and Iranian violations of United Nations protocols for nuclear inspections. It is offered with two engine options, a 3-cylinder 0.8 liter and a 4-cylinder 1.1 liter. Due to this, Kerman Khodro licensed the Chery QQ3 as the car was of a similar style to the GM car. However, as Kerman Khodro had replaced the GM Daewoo lines with that of Volkswagen, they put it into production at their subsidiary MVM as the 110. It is offered with two engine options, a 3-cylinder 0.8 liter and a 4-cylinder 1.1 liter.

Iran Khodro Co.:

Branded as IKCO, is an Iranian car manufacturer headquartered in Tehran. The company's original name was Iran national. IKCO was founded in 1962 and it produced 688,000 passenger cars in 2009 IKCO manufactures vehicles, including Samand, Peugeot and Renault cars, and trucks, minibuses and buses.

The company first started production of LP buses, the chassis of which were imported from Germany and assembled them in the current northern factory of Iran Khodro.

Reconsidering export strategies based on Iran's Supreme Leader recommendations and exporting 40 thousand cars through IKCO export network in 2010 with the main emphasis on sending IKCO brand cars to the Islamic countries' markets were put on the agenda. This led to the global sale of 30% of IKCO cars (national car) in 2010. Dena as IKCO's latest car enjoys world class standards regarding technology and design, the process of design and prototyping of which took less than a year. This sedan was unveiled on April 2011.

Since those aforementioned car manufacturing companies encompass 96.2% (SAIPA Co. with 43.3%; Iran Khodro Co. with 43.9% and Kerman Khodro and Modiran Khodro both with 9%); of Iran car market share, and in fact these companies are playing the main role in producing Completely Built Up (CBU) Vehicles and are competitors to sell their car in Iranian Market are selected to run first part of thesis and get the most important factors influencing on active innovation resistance. There is no other CBU vehicles manufacturers company in Iran, which made me to select just these car manufacturing companies.

3.3.1.1. The specification of Panel of experts

Since selecting qualified people for this section was difficult and these people are from top level of car producing companies. Thus finally 13 people are selected to reply the questionnaire. These 13 people selected precisely and have positions as follows:

1- Vice president of Export and International Sales of SAIPA-Citroen Company
2- Director of Marketing and sales, Asian and European Countries of SAIPA Company
3- Director of Marketing and sales, African and South American Countries of SAIPA Company
4- Director of Strategic Studies and Planning of SAIPA Company

5- General Manager of Technology and strategic Studies of SAIPA Company
6- General Manager of Future Studies and Macro Economies of SAIPA Company
7- General Manager of Local Sales and Marketing of Modiran Khodro Company
8- General Manager of Research and Development Department of SAIPA
9- Manager of Engineering Department of Iran Khodro Company
10- Vice President of Sales and Marketing of Kerman Khodro Company
11- Manager of Strategic studies and planning of SAIPA Company
12- Manager of new Technology studies of SAIPA Company
13- Manager of Overseas sales and international Affairs of SAIPA Company

The questionnaire of "Appendix A" Table 8.1 is distributed two times (first round and second round), among 13 people with aforementioned technical background. It was asked about importance of the 33 items that were intended to include in the definitive questionnaire. A second round to the same panel of experts approved their previous ideas and any changes occurred to the Table 8.2. The duration of collecting data and adjustment took 1.5 month from the last days of August 2019 till first days of October 2019 and the second round faced any changes by panel of experts, so finally 13 factors were finalized in Table 8.2 as the most important factors which are influencing on active innovation resistance in auto industry of Iran.

3.3.1.2. Delphi Method

The Delphi method has proven a popular tool in information systems research for identifying and prioritizing issues for managerial decision-making (Okoli & Pawlowski, 2004)

In order to identify important factors, the Delphi method is used to extract conceptual model at first phase of the research.

So, for knowing the effect of these identified factors on Innovation resistance, intention to buy, and also the effect of AIR on ITB, the second phase is conducted as the next step.

3.3.1.2.1 First Round of Delphi

In the first round one questionnaire of appendix A, table 8.1 distributed among panel of experts including of 13 people of Top managers from four aforementioned car manufacturing companies and they answered to 33 questions by 5-point Likert scale. The questionnaire is sent by email but some of them are collected face to face regarding the involvement of managers and being busy and assigning their time to the common meetings. After collecting the questionnaire and adjusting their replies the following results is obtained after sorting and distilling the replies of panel of experts. There was an opportunity for the addition of new ideas or opinions as mentioned in the last column of extra factors. Table 3.1. Shows answers from all participants.

Table 0.1. Results of first round of Delphi Methoud

Row	Functional Factors														Psychological Factors															Personal			
	Complexity	Trialability	Compatibility	Co-Dependence	Visibility	Communicability	Amenability	Realization	Perceived Risk	Relative Advantage	Divisibility	Reversibility	value	Originality	Personal Risk	Social Risk	Economic Risk	Functional Risk	Usage	Norms	Information	Image	Attitude	Personality	Perception	Motivation	Value Orientation	Previous Innovation Experience	Tradition	Usefulness	Age	Income	Education	EXTRA Factors
1	2	4	4	4	4	3	3	4	3	4	2	3	5	3	3	4	4	5	5	4	4	4	3	4	3	3	4	4	3	5	4	4	4	After Sale Services
2	3	4	4	3	5	4	5	4	5	2	3	4	5	5	5	5	4	5	5	4	4	1	1	2	2	3	4	4	1	5	4	3	3	
3	3	3	3	4	5	3	2	1	3	5	5	4	2	1	2	5	5	4	2	4	3	5	4	2	3	2	1	4	5	4	5	4	2	
4	2	3	4	4	3	3	3	4	2	4	2	3	4	3	3	4	3	4	4	3	4	3	3	3	3	3	4	3	3	4	3	3	4	
5	4	3	3	4	4	4	4	4	4	4	4	4	4	5	3	4	4	4	4	3	2	5	4	4	4	4	4	4	5	5	5	5	5	
6	4	5	5	4	5	4	5	5	4	4	4	4	5	5	5	5	5	5	5	4	5	5	5	5	5	4	4	5	4	5	5	5	4	
7	3	4	3	3	4	3	2	2	2	3	3	4	3	4	5	4	4	4	3	3	3	5	4	5	4	4	2	5	4	4	3	3	3	
8	3	4	2	3	2	2	1	2	4	1	1	2	3	1	1	3	1	1	3	3	3	5	3	4	3	3	1	4	4	2	3	5	4	
9	4	4	3	4	5	4	5	4	1	4	2	4	5	4	4	4	4	4	5	2	5	4	4	3	3	3	4	4	3	4	4	4	5	
10	5	4	3	5	5	2	3	5	2	2	3	3	5	4	3	4	5	5	4	2	2	4	2	2	4	4	4	5	3	5	3	4	4	
11	3	4	4	2	3	4	1	2	3	5	4	3	4	3	2	1	4	5	4	1	3	3	3	3	4	4	4	5	4	5	5	4	4	
12	4	2	3	5	5	3	5	5	5	5	4	2	5	1	5	4	4	5	5	4	3	5	3	4	4	4	5	2	3	5	4	4	4	
13	4	3	4	4	4	4	5	5	5	5	4	3	5	3	5	5	5	5	4	4	5	5	4	5	5	5	5	5	3	5	4	5	4	
Median	**3**	**4**	**3**	**4**	**4**	**3**	**3**	**4**	**3**	**4**	**3**	**3**	**5**	**3**	**3**	**4**	**4**	**5**	**4**	**3**	**3**	**5**	**3**	**4**	**4**	**4**	**4**	**4**	**3**	**5**	**4**	**4**	**4**	**4**
Mean	**3**	**4**	**3**	**4**	**4**	**3**	**3**	**4**	**3**	**4**	**3**	**3**	**4**	**3**	**4**	**4**	**4**	**4.3**	**4**	**3**	**3.5**	**4**	**3.3**	**3.5**	**3.6**	**3.5**	**4**	**4**	**3.5**	**4.5**	**4**	**4.1**	**4**	**4**

So, from Functional barriers just 6 factors, from psychological 7 factors and from personal factors all 3 factors are playing the main role on Active Innovation resistance based on ideas of panel of experts from the first round as follows.

Table 0.2. Adjustment of first round of Delphi Methoud

Functional Barriers						Psychological Barriers							Personal Barriers			Extra Factors
Trialability	Co-Dependence	Visibility	Realization	Relative Advantage	value	Social Risk	Economic Risk	Functional Risk	Usage	Image	Previous Innovation Experience	Usefulness	Age	Education	Income	After Sales Services

In the second round of Delphi method, by thanking and face to face meeting, the panel of expert approved the adjusted results of first round and so the results got prepared to be the base of conceptual model for moving forward to second phase of research which is qualitative step.

Since Personal factors are controlling factors, so they are not selected to be used in the second phase and in the model.

3.3.1.2.2. Second Round of Delphi

Since in the second round of Delphi method the respondents approved the results of factors of Table 3.2, which is adjusted factors of first round of Delphi , so the second round of Delphi finalized the Delphi method as factors mentioned in Table 3.2 and conducted the second phase of research and making questionnaire based on this results. So the final results of Delphi method after appreciating the Panel of Expert and approving the factors of Table 3.2 and approving the aforementioned results without any changes by them, so the final factors of Delphi method are

showed in Table 8.2 in appendix A. The Second phase of this study are conducted based on the results of Table 3.2.

3.3.2. The Second Phase of Research (Quantitative Phase)

In order to assess those factors which are clarified in first phase, the relevant questionnaire will be launched to customers who have not bought a SAIPA innovative car, purchasing instead a car of the same segment but not innovative.

The sample size will be calculated among those people who have not purchased the innovative vehicle of SAIPA Co. but have purchased vehicles from other car manufacturing companies, such as Iran Khodro Co., Modiran Khodro Co. or Kerman Khodro Co. The reason for acting in this way is the aim of this research, since the Innovation resistance is the goal of this research not innovation adoption, in order to realize the important factors influencing on innovation resistance we should focus on people who preferred not to purchase innovative vehicle of SAIPA co. and go to those companies which are manufacturing and offering the same platform vehicles but not as much as innovative vehicle as SAIPA offers them.

In order to group these important influencing factors on innovation resistance, the Exploratory Factor analysis will be used to extract operational model and SEM methods to analyze the effect of variables and identified factors on Innovation resistance. In brief to answer the main research question of this phase the exploratory factor analysis will be tested and in order to answer those 3 minor questions, the SEM method will be tested accordingly.

3.3.2.1. Statistical Population

The statistical population of this research encompass the customers who have not bought a SAIPA innovative car, purchasing instead a car of the same segment but not innovative. The purchased cars by this population are among vehicles from three other car manufacturing companies which are Iran Khodro Co., Kerman Khodro co and finally Modiran Khodro Co.

3.3.2.2. Sampling

The sample size will be calculated among those people who have not purchased the innovative vehicle of SAIPA Co., the sample size based on Morgan's Table will be calculated from population size of customers who have resisted for purchasing innovative car of SAIPA Co. and have purchase vehicles from same segment but not innovative cars from Iran Khodro Co., Modiran Khodro Co and Kerman Khodro Co.

It is supposed the sample size with confidence of 95% and Margin of Error of 5.0% can be calculated. Sample size is calculated as follows:

1. The volume of purchased vehicles of SAIPA innovative car is about 2,900 units.
2. The vehicles which are not innovative but at the same segment of other 3 car companies such as Iran Khodro vehicle about 18,900 units.
3. Modiran Khodro vehicle about 10,550 units.
4. Finally, Kerman Khodro 228 units.

So total population of non-innovative purchased cars or in fact those competitors of innovative car is about 29,678 units.

Based on the Cochran formula which is as follows:

$$n = \frac{Nz^2pq}{Nd^2 + z^2pq}$$

N: Population size

Z: 1.96

P = q = 0.5

d: Margin of error

Therefore, with N equal to 29,678 and with margin error of 0.05, the result of Cochran formula after calculating the sample size will be 379 units.

Accordingly, about 379 customers who have purchased non innovative car should be selected in order to answer the questionnaire regarding factors influencing the innovation resistance. After running the second phase and distributing the questionnaire among customers, 265 questionnaires are collected finally.

So these aforementioned customers are contacted by going to workshops and showroom of these car manufacturing companies where they are supposed to get their first car service, it was supposed to contact with 379 people regarding the sales rate of those selected vehicles, but after 2.5 months just about 265 questionnaire were collected regarding the difficulties of this step.

It should be mentioned the customers are asked questions by going to workshops of those IKCO co. Modiran khodro Co. and Kerman Khodro Co. showrooms and specially workshops and are distributed among customers who have come to receive their first after sales services. The mentioned questionnaire is mentioned in Appendix B in details in Table 8.3 and all following Table 3.3 in brief.

Table 0.3. Items of questionnaire in second phase

Construct		Description
Barriers	Q1	It is impossible to test it before purchasing? (Trialability)
	Q2	It needs additional parts or services? (Co-Dependence)
	Q3	You see difficulties in using by people who have bought it (Visibility)
	Q4	The Benefits of it can't be achieved in a short-time? (Realization)
	Q5	There is no economic gain or cost-saving for you? (Relative Advantage)
	Q6	It does not have any advantage or superior performance over the existing new cars? (Value)
	Q7	It represents a challenging after sales services such as no available parts or not affordable? (After Sales Services)
	Q8	It represents a bad value for money? (Economic Risk)
	Q9	You fear that it could be dysfunctional or mal-functional? (Functional risk)
	Q10	There is an inconsistency with your past experiences that disrupt established usage patterns? (Usage)
	Q11	You have bad image of its country of origin or it's Brand? (Image)
	Q12	You have bad experience based on it? (Previous Innovation Experience)
	Q13	It does not provide any benefit that fulfills your needs? (Usefulness)
Active Innovation Resistance (Wiedmann et al., 2011)	Q14	In sum, a possible purchase of it would cause problems that I don’t need
	Q15	I would be making a mistake by purchasing it
	Q16	In the near future, the purchase would be connected with too many uncertainties
Intention to Buy (Shihab & Putri, 2018)	Q17	I am considering purchasing this product
	Q18	I will purchase this product when I need it
	Q19	I will purchase this product soon

3.3.2.3. Running Questionnaire of Second Phase and Data collection

In order to run questionnaire for this phase, the base of questionnaire is created on the results of Delphi method which is mentioned in Table 3.2 and in Table 8.2 of appendix A as well, but since the conceptual model of this thesis which is mentioned in Chapter 2. In figure 2.8 so in order to develop the questionnaire of quantitative phase of this research two constructs such as AIR (Active Innovation Resistance) and also ITB (Intention to Buy) are asked in the questionnaire of this phase in order to find the effect of each functional and psychological barriers on these constructs.

AIR and ITB are two constructs which based on the literature review which is done in chapter 2 can be defined and asked in the quantitative questionnaire by following questions:

- **AIR1:** In sum, a possible purchase of it would cause problems that I don't need (Wiedmann et al., 2011)**.**
- **AIR2:** I would be making a mistake by purchasing it (Wiedmann et al., 2011).
- **AIR3:** In the near future, the purchase would be connected with too many uncertainties (Wiedmann et al., 2011).

- **ITB1:** I am considering purchasing this product (Shihab & Putri, 2018).
- **ITB2:** I will purchase this product when I need it (Shihab & Putri, 2018).
- **ITB3:** I will purchase this product soon (Shihab & Putri, 2018).

So finally, the five Hypothesis of these phase will be tested by SEM method which are:

- Functional and Psychological Factors have the Positive and significant effect on Innovation resistance.
- Functional and Psychological Factors have the Negative and significant effect on Intention to buy.
- Active Innovation Resistance has the Negative and significant effect on Intention to buy.

After analyzing the data and extracting the results, the final model of this research will be rendered as explained in Chapter 2. Figure 2.8.

CHAPTER 4-DATA ANALYSIS

4.1- Introduction

The previous chapters have identified the research gaps in innovation resistance studies. Based on the practical and theoretical literature review a theoretical model is developed for the potential antecedents of innovation resistance using an extensive review of relevant studies.

In this chapter, we analyze in detail the collected data. The data collected through questionnaires were entered into SPSS and lisrel software and analyzed. In this section, the data are analyzed using a descriptive and inferential approach. In descriptive statistics section, data analysis is done through mean, standard deviation and frequency. Inferential analysis section is also analyzed using T-tests and factor analysis of data. Research models are also designed using structural equation modeling.

It should be mentioned that the first round questionnaire including 33 factors influencing active innovation resistance (Appendix A; First Round of Questionnaire of Delphi Model) made the new version of factors which obtained the most important level from respondents point of view and finally 13 factors were selected as the most important factors playing the main role in active innovation resistance.

Based on the theoretical model, 13 people as the panel of experts was selected and the Delphi process is implemented for this section and based on the opinions of panel of experts the conceptual model was extracted.

In the second phase of this research, the validity and reliability of the questionnaire was assessed through a pre-survey of 20 individuals and after the validity of the questionnaire was performed at the sample group level.

The relevant questionnaire was extracted and data selection take place in February and March 2020 in Iran among selected sample which was 265 people who were selected among owners of H30 Cross, lifan X50 and MVM X22 which belong to the Iran khodro, Kerman khodro and Modiran khodro.

For analyzing the gathered data and grouping factors, exploratory factor analysis method will be developed and the operational model will be extracted.

The effects of variables/factors are tested by SEM method. There are two approaches in using structural equation modeling: the one-step approach and two-step approach

(Hair & Babin, 2017). In the one-step approach, the measurement model and the structural model are simultaneously estimated.

In the two-step approach, which was used in this research, first the measurement model is estimated and in the second step the structural model is evaluated. Using the two-step approach is preferred because valid structural models cannot be tested with bad measures (Hair et al., 2006; Anderson and Gerbing, 1988). When the two-step approach is preferred, the process of evaluating a structural model should follow the recommendations by Anderson and Gerbing (1988).

The quantitative data obtained through the questionnaire are analyzed later in the chapter. In the quantitative data analysis ،demographic data are first analyzed and then the main data of the questionnaire are analyzed. The reliability of the questionnaire was measured based on the data collected from the entire statistical sample by means of SPSS software. The results are as follows in Table 4.1.

Table 4.1. Testing the validity of the whole questionnaire using Cronbach's test

Dimensions	Number of questionnaires	Number of questions	Alpha coefficient
All variables(total)	**265**	**19**	**0.827**
Functional variables	265	7	0.888
Psychological variables	265	6	0.878
Active Innovation resistance variables	265	3	0.812
Intention to Buy variables	265	3	0.884

In terms of Cronbach's alpha reliability, having an alpha coefficient of less than 60% is generally considered to be "poor", at least 70% acceptable and at high 80% good. Table 4.1 shows Alpha coefficient is in good shape.

4.2- Data Analysis

The quantitative data collected through questionnaires were analyzed using SPSS software. Analyzes are presented in two parts: descriptive and inferential analysis.

4.2.1- Descriptive analysis - Demographic data analysis

Descriptive analysis consists of providing graphs of demographic variables that are presented in detail below. These charts will clearly show the frequency of each demographic variable (age, Income & education).

4.2.1.1- Respondents' Age level

Figure 4.1 shows respondents' Age level.

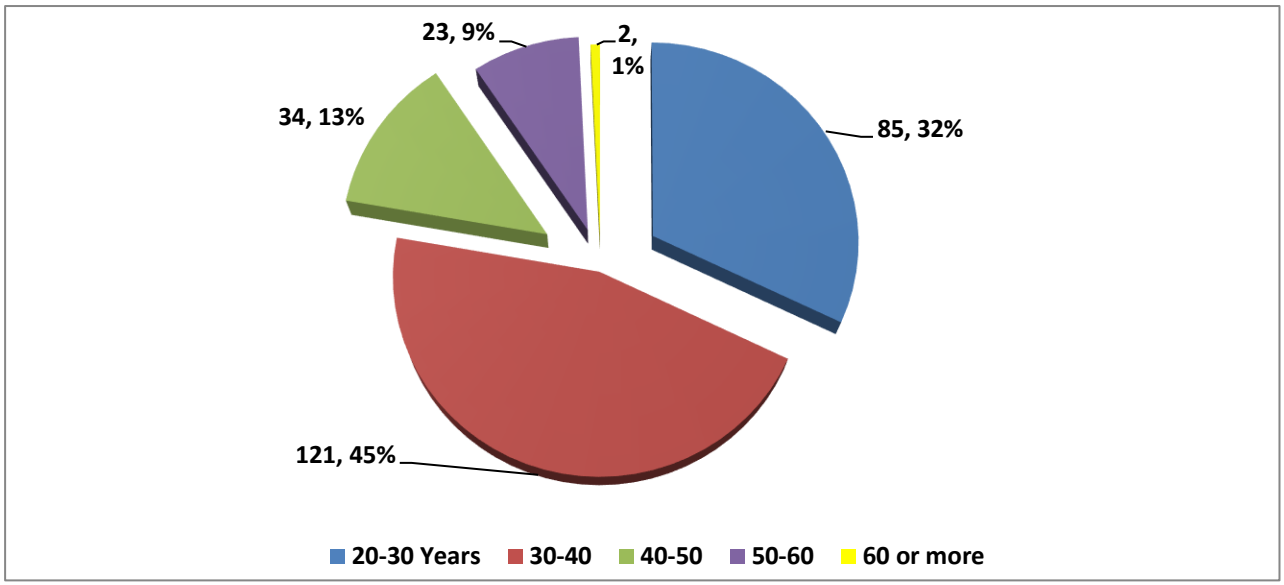


Figure 4.1. Frequency of respondents' age

The total sample in this study was 265 people out of which 85 people were in the age range of 20-30 years, 121 people in the age range of 30-40 years, 34 people in the age range of 40-50 years, 23 people in the range of over 50-60 and finally 2 people were in the age of more than 60 years old.

4.2.1.2- Respondents' Education level

Figure 4.2 shows respondents' Education level.

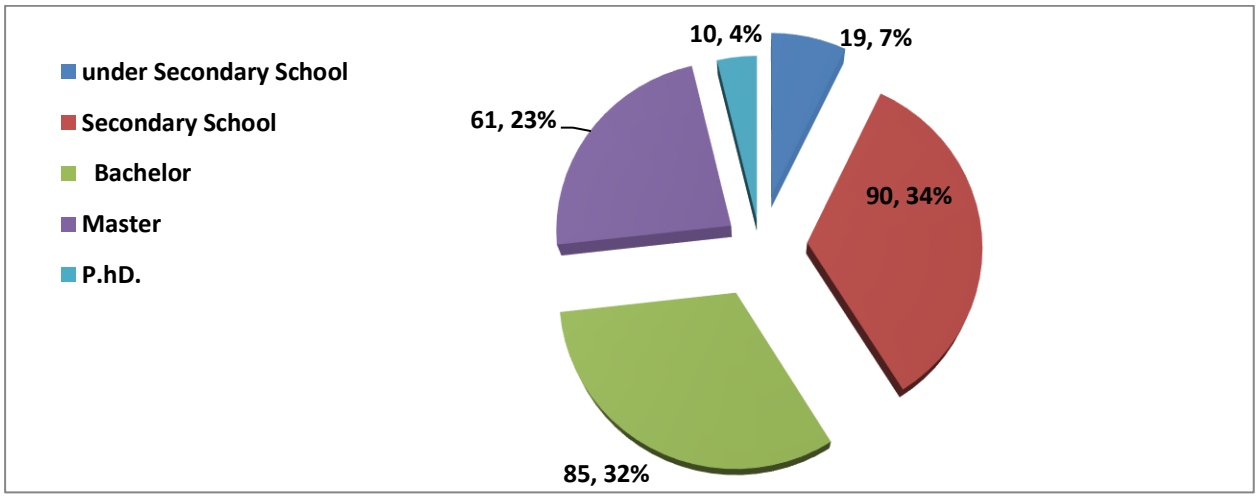


Figure 4.2. Frequency of respondents' Education Level

The total sample in this study consisted of 265 people out of whom 19 people were under secondary school, 90 people were holding secondary school, 85 people were holding bachelor degree, 61 people were holding Master degree and finally 10people were holding their Ph.D. degree.

4.2.1.3- Respondents' Income level

Figure 4.3 shows respondents' Income level.

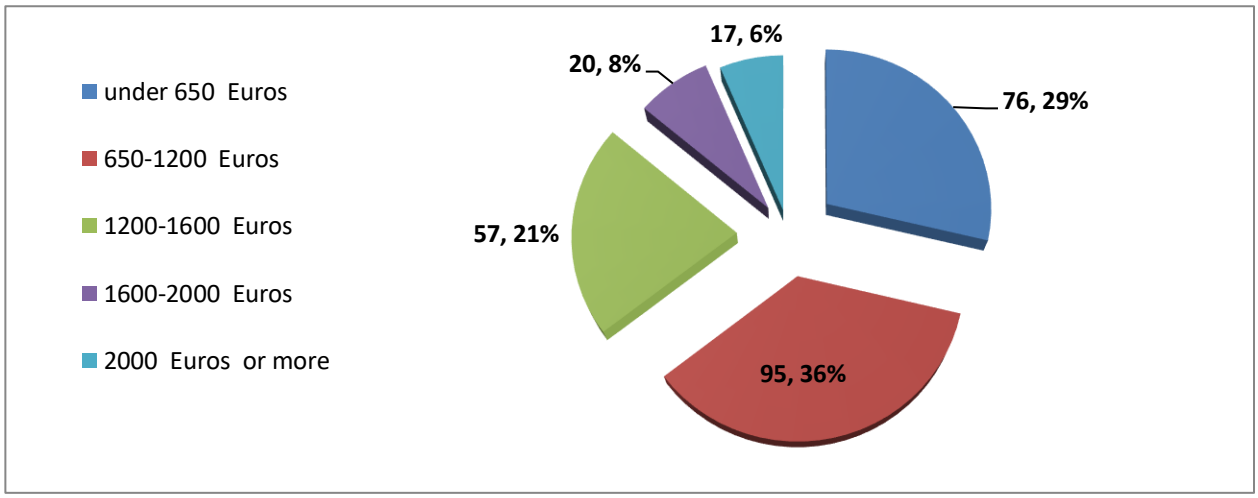


Figure 4.3. Frequency of respondents' Income Level

The total sample in this study consisted of 265 people out of whom 76 people had income under 650 €, 95 people had income of 650 to1200 €, 57 people had income of 1200 to 1600 €, 20 people had income of 1600 to 2000 € and finally 17 people had income of more than 2000 €.

In brief data for the first sample was collected in February and March of 2020, from a convenience sample of Iranian potential customers. Table 4.2 shows characteristics sample in brief.

Table 4.2. Demographic characteristics of the sample in brief

	Number	%
Age		
20 – 30 years	85	32%
30 – 40 years	121	45%
40 – 50 years	34	34%
50 – 60 years	23	23%
More than 60 years	2	2%
Total	265	100%
Educational level		
Under secondary school	90	34%
Secondary school	85	32%
Bachelor	61	23%
Master	10	4%
Ph.D.	19	7%
Total	265	100%
Income level		
< 650 euros	76	29%
Between 650 and 1,200	95	36%
Between 1,200 and 1,600	57	21%
Between 1,600 and 2,000	20	8%
> 0,000 euros	17	6%
Total	265	100%

4.2.2. Exploratory Factor Analysis

Based on the definition by Hair et al. (Hair & Babin, 2017) factor analysis provides the tools for analyzing the structure of the inter-relationships (correlations) among a large number of variables (e.g. test scores, test items, questionnaire responses) by defining sets of variables that are highly interrelated, known as factors.

The purpose of exploratory factor analysis was to: (1) understand the structure of measurement models; and (2) refine and remove items if appropriate.

Factor analysis is most often performed on metric variables, so the factor analysis was used for the following measurement scales: Trialability, Co-dependence, Visibility, Realization, Relative Advantage, Value, after sales Services.

The method of factor extraction for all variables was principle component analysis (PCA) and, based on recommendations by Field (Field, 2009), only factors with Eigenvalues more than 1 were kept.

The term 'Eigenvalue' refers to the amount of variance accounted for by a factor (Hair & Babin, 2017).

Varimax rotation method was used in extracting factors which is defined as 'maximizing the dispersion of loading with factors and loads a smaller number of variables highly onto each factor resulting in more interpretable clusters of factors' (Field, 2009).

Once the structure of factors is identified, factor loadings are also calculated which is the correlation of each variable and the factor; in other words with factor loading, it is possible to assess which variables make up which factor (Field, 2009).

The item with low factor loading, if it does not represent high loading with another factor in the case of multiple factor solution, is a candidate for removal because that item does not significantly contribute to the measurement scale (Field, 2009; Hair & Babin, 2017).

Based on the recommendations by Field in 2009, for a sample size of 50, a loading of 0.722 can be considered significant and when sample size increases the lower loadings can be considered significant. For a sample size of 200 the loading should be greater than 0.36 and for 300 it should be greater than 0.29.

Factor analysis can determine whether the questionnaire measures the indicators. In factor analysis, questions designed to evaluate a particular index or trait should have a common factor load.

Variables in the analytical model of this study include 19 questions that refer to the innovation resistance behavior in automotive industry of Iran which takes place in 4 car manufacturing companies.

Each of the indicators is called a "Factor" and is represented by F and Generally Lij is called Factor loadings, the correlation of an index with a factor is called the factor loading, Fjs or their estimation, which are called operating privileges.

In this research, the primary factors of these variables were extracted using first-order exploratory factor analysis technique, the results of which are as follows.

Table 4.3. KMO and Bartlett test details

Variable	KMO and Bartlett test	Eigen value	Total Variance
Functional Barrier	KMO=0.911 Sig=0.000 Bartlett Test Number=854.419 So, Data have the required condition to perform factor analysis	All of 7 questions related to Functional Barriers make one factor (Eigenvalue of one of questions 4.2 and the rest of them is under 1) it means that one factor is formed.	60.002
Psychological Barrier	KMO=0.865 Sig=0.000 Bartlett Test Number=750.793 So, Data have the required condition to perform factor analysis	All of 6 questions related to Psychological Barriers make one factor (Eigen value of one of questions 3.730 and the rest of them is under 1) it means that one factor is formed.	62.164
Active Innovation Resistance	KMO=0.611 Sig=0.000 Bartlett Test Number=366.235 So, Data have the required condition to perform factor analysis	All of 3 questions related to Active Innovation Resistance (AIR) make one factor (Eigen value of one of questions 2.193 and the rest of them is under 1) it means that one factor is formed.	73.104
Intention to Buy	KMO=0.707 Sig=0.000 Bartlett Test Number=459.800 So, Data have the required condition to perform factor analysis	All of 3 questions related to Intention to Buy (ITB) make one factor (Eigen value of one of questions 2.435 and the rest of them is under 1) it means that one factor is formed.	81.155

4.2.2.1- Functional Barriers

The Functional Barriers consists of seven items. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for Principle Component Analysis in all factors, KMO = 0.911 which was higher than 0.50 (Field, 2009). Bartlett's test of Sphericity χ^2 = 854.419, p<0.001; indicated that correlations between items were sufficiently large for PCA (Table 4.3).

All components had Eigenvalues over Kaiser's criterion of 1, so all measurement scales should have exactly the same items. The results of factor analysis and correspondent communalities are presented in Table 4.4.

Table 4.4. The matrix Factor Loadings of the Functional Variable

Questions	Communalities	Factor load
Q1	.572	.757
Q2	.591	.768
Q3	.532	.730
Q4	.675	.821
Q5	.572	.756
Q6	.642	.801
Q7	.616	.785

Based on the results of factor analysis and what is presented in the Table 4.4, the seven indicators of the conceptual model of the research are classified into 1 factor (Functional factor).

4.2.2.2- Psychological Barriers

The Psychological Barriers consists of six items. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for Principle Component Analysis in all factors, KMO=0.865 which was higher than 0.50 (Field, 2009) Bartlett's test of Sphericity $\chi 2$ = 750.793, p<0.001; indicated that correlations between items were sufficiently large for PCA (Table 4-3).

All components had Eigenvalues over Kaiser's criterion of 1, so all measurement scales should have exactly the same items. The results of factor analysis and correspondent communalities are presented in Table 4.5.

Table 4.5. The matrix F Factor Loadings of Psychological Barriers

Questions	Communalities Ratio	Factor load
Q8	.619	.787
Q9	.657	.810
Q10	.520	.721
Q11	.700	.837
Q12	.650	.806
Q13	.584	.764

Based on the results of factor analysis and what is presented in the Table 4.5, the six indicators of the conceptual model of the research are classified into 1 factor (Psychological factor).

4.2.2.3- Active Innovation Resistance

The Active Innovation Resistance (AIR) consists of 3 items. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for Principle Component Analysis in all factors, KMO=0.611 which was higher than 0.50 (Field, 2009), Bartlett's test of sphericity χ^2 = 366.235, $p<0.001$; indicated that correlations between items were sufficiently large for PCA (Table 4.3)

All components had Eigen values over Kaiser's criterion of 1, so all measurement scales should have exactly the same items. The results of factor analysis and correspondent communalities are presented in Table 4.6.

Table 4.6. The matrix Factor Loadings of the Active Innovation Resistance Variable

Questions	Communalities Ratio	Factor load
Q14	.536	.732
Q15	.866	.931
Q16	.791	.889

Based on the results of factor analysis and what is presented in the Table 4.6, the 3 indicators of the conceptual model of the research are classified into 1 factor (Active Innovation Resistance factor).

4.2.2.4- Intention to Buy

The Intention to Buy (ITB) consists of 3 items. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for Principle Component Analysis in all factors, KMO=0.611 which was higher than 0.50 (Field, 2009). Bartlett's test of sphericity $\chi 2 = 366.235$, $p<0.001$; indicated that correlations between items were sufficiently large for PCA (Table 4-3).

All components had Eigen values over Kaiser's criterion of 1, so all measurement scales should have exactly the same items. The results of factor analysis and correspondent communalities are presented in Table 4.7.

Table 4.7. The matrix Factor Loadings of the Intention to Buy Variable

Questions	Communalities Ratio	Factor load
Q17	.876	.936
Q18	.758	.871
Q19	.800	.895

Based on the results of factor analysis and what is presented in the Table 4.7, the 3 indicators of the conceptual model of the research are classified into 1 factor (Intention to buy factor).

4.2.3- Structural Equation Modeling (SEM) & Confirmatory Factor Analysis

In the next step of assessing construct validity of measurement models, CFA analysis was performed using the LISREL software package. The purpose of using CFA analysis was to test how well measured variables represent the constructs. CFA is a special type of exploratory factor analysis and is the first part of a complete test of a structural model (Hair et al., 2006).

Structural Equation Modeling and Confirmatory Factor Analysis Structural equation modeling (SEM) is a technique that allows separate relationships for each of a set of

dependent variables. In its simplest sense, structural equation modeling provides the appropriate and most efficient estimation technique for a series of separate multiple regression equations estimated simultaneously (Hair & Babin, 2017). It is characterized by two basic components:

(1) The structural model and

(2) The measurement models.

The structural model is the path model, which relates independent to dependent variables.

In such situations, theory, prior experience, or other guidelines enable the researcher to distinguish which independent variables predict each dependent variable (Hair & Babin, 2017).

In a confirmatory factor analysis, the researcher can assess the contribution of each scale item as well as incorporate how well the scale measures the concept (reliability). The scales are then integrated into the estimation of the relationships between dependent and independent variables in the structural model. This procedure is similar to performing a factor analysis (discussed in a later section) of the scale items and using the factor scores in the regression (Hair & Babin, 2017).

SEM provides a means of not only assessing each of the relationships simultaneously rather than in separate analyses, but also incorporating the multi-item scales in the analysis to account for measurement error (Hair & Babin;, 2017).

CFA analysis is part of structural equation modeling (SEM) and, according to Hair et al. (2006), there are six stages in SEM analysis in which the first four stages involve examining measurement theory or CFA analysis. The last two stages involve examining the structural model. The six stages are presented in Figure 4.4.

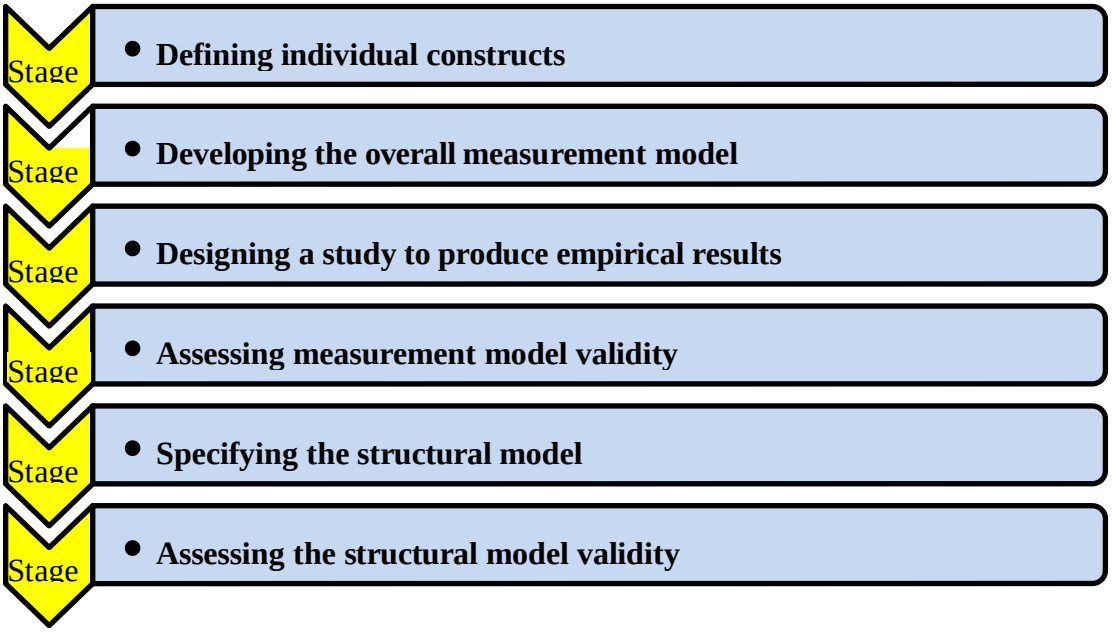


Figure 4.4.Sixstages in Structural Equation Modeling (Hair & Babin, 2017)

The validity of a measurement model (stage 4 in Figure 4.4) is about the empirical estimation of how the theory fits the collected data. For example, how the measurement model for traditionalism can truly represent the collected data. Both EFA and CFA analysis are useful to diagnose problematic items. The validity of a measurement model depends on goodness of fit for the measurement model and the construct validity (Hair & Babin, 2017).

Thus for a measurement model to be valid, the conditions of construct validity (face validity and convergent validity) and good model fit should be met.

The goodness of fit indicates the similarity of the observed and estimated covariance matrices of items (Hair & Babin, 2017).

The closer the values of these two matrices, the better can be the measurement model.

The most fundamental measure of fit is chi-square (χ^2) measuring the difference between observed sample covariance matrix and SEM estimated covariance matrix (Hair & Babin, 2017).

The high value of χ^2 shows that the model does not fit with the data very well. If the p value of χ^2 is not significant, it refers to the fact that the difference between observed and estimated covariance matrix is not significant and this is what a researcher desires when analyzing a hypothetical model.

However, in practice, achieving a low and non- significant chi-square does not always occur. Chi-square is very sensitive to sample size and, as the following formula suggests, if the sample size is large, chi-square inevitably becomes high. Therefore relying on chi-square alone is not sufficient to assess the validity of a model (Hair & Babin;, 2017)

$X2= (N-1)$ (Observed sample covariance matrix- SEM estimated covariance matrix)

Where N is the sample size.

Some of the alternative measures that can be used for assessing validity are Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), and root Mean Square of Approximation (RMSEA), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Non-normed Fit Index (NNFI). Among these measures, RMSEA is known as badness of fit and a low value indicates a better model fit. Based on the guidelines by researchers in SEM (Hair & Babin;, 2017), the value of RMSEA should be less than 0.08 and for other measures they should be above 0.90, a researcher does not need to report all fit indices (Hair & Babin, 2017).

Using three to four indices provides adequate evidence of model fit. When the validity measures are provided by the software, it might be necessary to modify (re-specify) the measurement model (and also the structural model) as the model fit indices do not represent good model fit. To diagnose problems in models, whether CFA models or structural models, a researcher can rely on the following areas:

1- Path estimates: one of the potential problems of models is the path estimate which links constructs to indicator variables. As mentioned before, the loadings should be high and have significant relationship with constructs. If an item is non-significant or shows low loading, it should be considered for deletion (Hair & Babin, 2017).

2- Standardized residuals: residuals refer to 'the individual differences between observed covariance terms and the fitted covariance terms' (Hair & Babin, 2017). The standardized residuals are the raw residuals divided by standard deviation.(Hair & Babin;, 2017)
3- Modification indices: modification index is the amount the overall value of $\chi 2$ would be reduced by estimating a path which is currently not estimated. High

modification indices suggest that the fit could be improved significantly by freeing (estimating) a path(Hair & Babin, 2017).

In summary, a researcher should not rely only on statistical results to remove an item or estimate a path. A combination of both conceptual theory and statistical results provide guidelines to improve a model. Now based on the guidelines for assessing the validity of models, the results of CFA analysis for measurement models will be presented for all countries.

4.2.3.1- Investigating Measurement Models of Research Variables

Before entering the hypothesis testing / answering questions and presenting the research model, it is necessary to verify the validity of the research variables measurement models. In the following, the measurement models of this research are presented respectively. This was done by first-order confirmatory factor analysis using LISREL software.

4.2.3.1.1- Measurement Model of Functional Factor

The heart of the measurement is the results of confirmatory factor analysis of the questionnaire questions based on the output of exploratory factor analysis. The results of confirmatory factor analysis showed that there is a positive and significant correlation between the dimensions of functional factors.

The Table 4.8 shows the variables of Functional factors in standard estimation mode and also in Significant Coefficients Mode. The estimation results show that the model is suitable. Given the LISREL output, the calculated χ^2 value is 26.15, which is a low value (if the χ^2 to df ratio is less than 3, the χ^2 value is good and low, and the model is well-fit, the lower the χ^2 value, and in other words, the lower the χ^2 / df ratio the better the model is and the more appropriate it is).

In this model the ratio is about 1.87. The low value of this index indicates a slight difference between the conceptual model of research and the observed data. The RMSEA is also 0.057. The lower the RMSEA index, the more suitable the model is. This index is less than 0.08 good and less than 0.05 excellent. Also, the standard

models of measurement models show the effect of each of the variables or questions in explaining the variance of the principal or factor scores.

Table 4.8. Goodness of fit statistics indicators(Functional)

Goodness of fit statistics	Value
Degrees of freedom	14
Chi-square	26.15
χ^2/df	1.87 (less than 3)
Root Mean Square Error of Approximation (RMSEA)	0.057
Goodness of Fit Index (GFI)	0.96
Adjusted Goodness of Fit Index (AGFI)	0.93

The significance of these numbers indicates that the model is meaningful and validated. In other words, each question is considered as a Functional factor in the model.

Table 4.9. Confirmatory factor analysis Results

Variable	Standardized Loading	t-value
Functional Factors		
Q1(Func1)	0.71	12.73
Q2(Func2)	0.72	12.90
Q3(Func3)	0.67	11.76
Q4(Func4)	0.80	15.01
Q5(Func5)	0.71	12.65
Q6(Func6)	0.77	14.22
Q7(Func7)	0.74	13.41
Psychological Factors		
Q8(Psy1)	0.72	12.81
Q9(Psy2)	0.76	14.01
Q10(Psy3)	0.64	11.14
Q11(Psy4)	0.82	15.46
Q12(Psy5)	0.77	14.20
Q13(Psy6)	0.72	12.79
Active Innovation Resistance (AIR)		
Q14(AIR1)	0.53	8.85
Q15(AIR2)	0.88	18.03
Q16(AIR3)	0.89	17.61
Intention to Buy (ITB)		
Q17(ITB1)	0.96	19.43
Q18(ITB2)	0.77	14.15
Q19(ITB3)	0.82	15.52

4.2.3.1.2- Measurement Model of Psychological Factor

The heart of the measurement is the results of confirmatory factor analysis of the questionnaire questions based on the output of exploratory factor analysis. The results of confirmatory factor analysis showed that there is a positive and significant correlation between the dimensions of Psychological factors. The Table 4.10 shows the variables of Psychological factors in standard estimation mode and also in Significant Coefficients Mode.

The estimation results show that the model is suitable. Given the LISREL output, the calculated χ^2 value is 19.91, which is a low value (if the χ^2 to df ratio is less than 3, the χ^2 value is good and low, and the model is well-fit, the lower the χ^2 value, and In other words, the lower the χ^2 / df ratio the better the model is and the more appropriate it is).

In this model the ratio is about 2.21. The low value of this index indicates a slight difference between the conceptual model of research and the observed data. The RMSEA is also 0.067. The lower the RMSEA index, the more suitable the model is.

This index is less than 0.08 good and less than 0.05 excellent. Also, the standard models of measurement models show the effect of each of the variables or questions in explaining the variance of the principal or factor scores.

Table 4.10. Goodness of fit statistics indicators (Psychological)

Goodness of fit statistics	Value
Degrees of freedom	9
Chi-square	19.91
χ^2/df	2.21 (less than 3)
Root Mean Square Error of Approximation (RMSEA)	0.067
Goodness of Fit Index (GFI)	0.96
Adjusted Goodness of Fit Index (AGFI)	0.93

The significance of these numbers indicates that the model is meaningful and validated. In other words, each question is considered as a Psychological factor in the model.

4.2.3.1.3- Measurement Model of Active Innovation Resistance (AIR) Factor

The heart of the measurement is the results of confirmatory factor analysis of the questionnaire questions based on the output of exploratory factor analysis. The results of confirmatory factor analysis showed that there is a positive and significant correlation between the dimensions of AIR factors.

The Table 4.11 shows the variables of AIR factors in standard estimation mode and also in Significant Coefficients Mode.

The estimation results show that the model is suitable. Given the LISREL output, the calculated χ^2 value is 2.06, which is a low value (if the χ^2 to df ratio is less than 3, the χ^2 value is good and low, and the model is well-fit, the lower the χ^2 value, and In other words, the lower the χ^2 / df ratio the better the model is and the more appropriate it is).

In this model the ratio is about 2.06. The low value of this index indicates a slight difference between the conceptual model of research and the observed data. The RMSEA is also 0.063. The lower the RMSEA index, the more suitable the model is.

This index is less than 0.08 good and less than 0.05 excellent. Also, the standard models of measurement models show the effect of each of the variables or questions in explaining the variance of the principal or factor scores.

Table 4.11. Goodness of fit statistics indicators (AIR)

Goodness of fit statistics	Value
Degrees of freedom	1
Chi-square	2.06
χ^2/df	2.06 (less than 3)
Root Mean Square Error of Approximation (RMSEA)	0.063
Goodness of Fit Index (GFI)	0.96
Adjusted Goodness of Fit Index (AGFI)	0.93

The significance of these numbers indicates that the model is meaningful and validated. In other words, each question is considered as an AIR factor in the model.

4.2.3.1.4- Measurement Model of Intention to Buy (ITB) Factor

The heart of the measurement is the results of confirmatory factor analysis of the questionnaire questions based on the output of exploratory factor analysis. The results of confirmatory factor analysis showed that there is a positive and significant correlation between the dimensions of ITB factors.

The Table 4.12 shows the variables of ITB factors in standard estimation mode and also in Significant Coefficients Mode.

The estimation results show that the model is suitable. Given the LISREL output, the calculated χ^2 value is 0, which is a low value (if the χ^2 to df ratio is less than 3, the χ^2 value is good and low, and the model is well-fit, the lower the χ^2 value, and in other words, the lower the χ^2 / df ratio the better the model is and the more appropriate it is).

In this model the ratio is about 0. The low value of this index indicates a slight difference between the conceptual model of research and the observed data. The RMSEA is also 0.000. The lower the RMSEA index, the more suitable the model is. This index is less than 0.08 good and less than 0.05 excellent. Also, the standard models of measurement models show the effect of each of the variables or questions in explaining the variance of the principal or factor scores.

Table 4.12. Goodness of fit statistics indicators (AIR)

Goodness of fit statistics	Value
Degrees of freedom	0
Chi-square	0
χ^2/df	0 (less than 3)
Root Mean Square Error of Approximation (RMSEA)	0.000
Goodness of Fit Index (GFI)	0.96
Adjusted Goodness of Fit Index (AGFI)	0.93

The significance of these numbers indicates that the model is meaningful and validated. In other words, each question is considered as an ITB factor in the model.

4.2.3.2- Structural Models

After performing confirmatory factor analysis, in this section we will investigate the research hypotheses by performing structural analysis. Structural equation modeling using LISREL statistical software was used to test the research hypotheses. The numbers written on the lines are actually beta coefficients of the regression equation between variables, also called path coefficients.

4.2.3.2.1- First Model (Primary Model)

In this study, two independent variables and two dependent variables were investigated. The independent variable functional has seven factors and psychological has six factors. The dependent variable AIR has three factors and ITB has three factors as well.

In this section, the impact of functional and psychological exogenous (independent) variables on endogenous (dependent) variables of Active Innovation Resistance (AIR) and Intention to buy (ITB) is evaluated and analyzed. After analyzing the structural equations of these variables, the results can be expressed in the Figure 4.5. The structural model of the research, shown in Figure 4.5 in the standard case, illustrates the relationship between the exogenous and endogenous variables in general.

As can be seen in the figure, the coefficient of path between Functional and Psychological is positive on Active Innovation Resistance (AIR), which indicates the positive effect of these factors on Active Innovation Resistance.

Moreover, as can be seen in the figure 4.5, the coefficient of path between Functional and Psychological is positive on Intention to Buy (ITB), which indicates the positive effect of these factors on Intention to Buy.

The next model determines whether this coefficient is significant or not, as well as whether the model's originality can be verified in terms of fitting criteria, which is presented below.

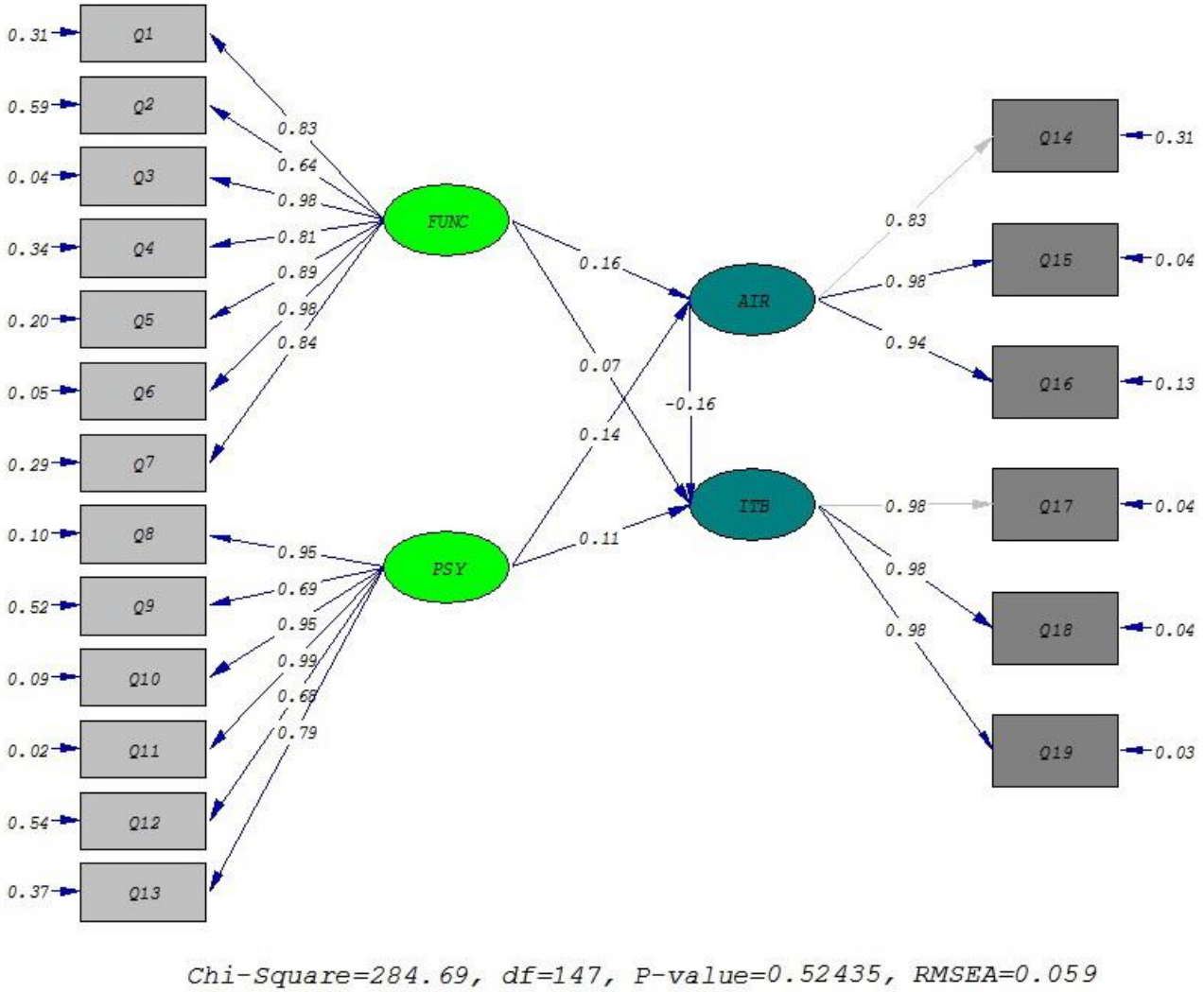


Figure 4.5. Structural Model of Research in Standard Mode

In the structural model, external variables "Functional" and "Psychological" do not necessarily have to be correlated with each other because this indicates that they can be independent of each other and affect a variable. In this particular case, functional and psychological factors can independently affect the variable of innovation Resistance.

According to this theory, exogenous variables are independent variables whose value is not determined by any of the model variables and is determined from the outside. If there is a high correlation between independent exogenous variables, it is said that there is "Multicollinearity".

The second output, shown below, shows the significant numbers of the research model. Based on this model, the coefficients of the path coefficients can be investigated.

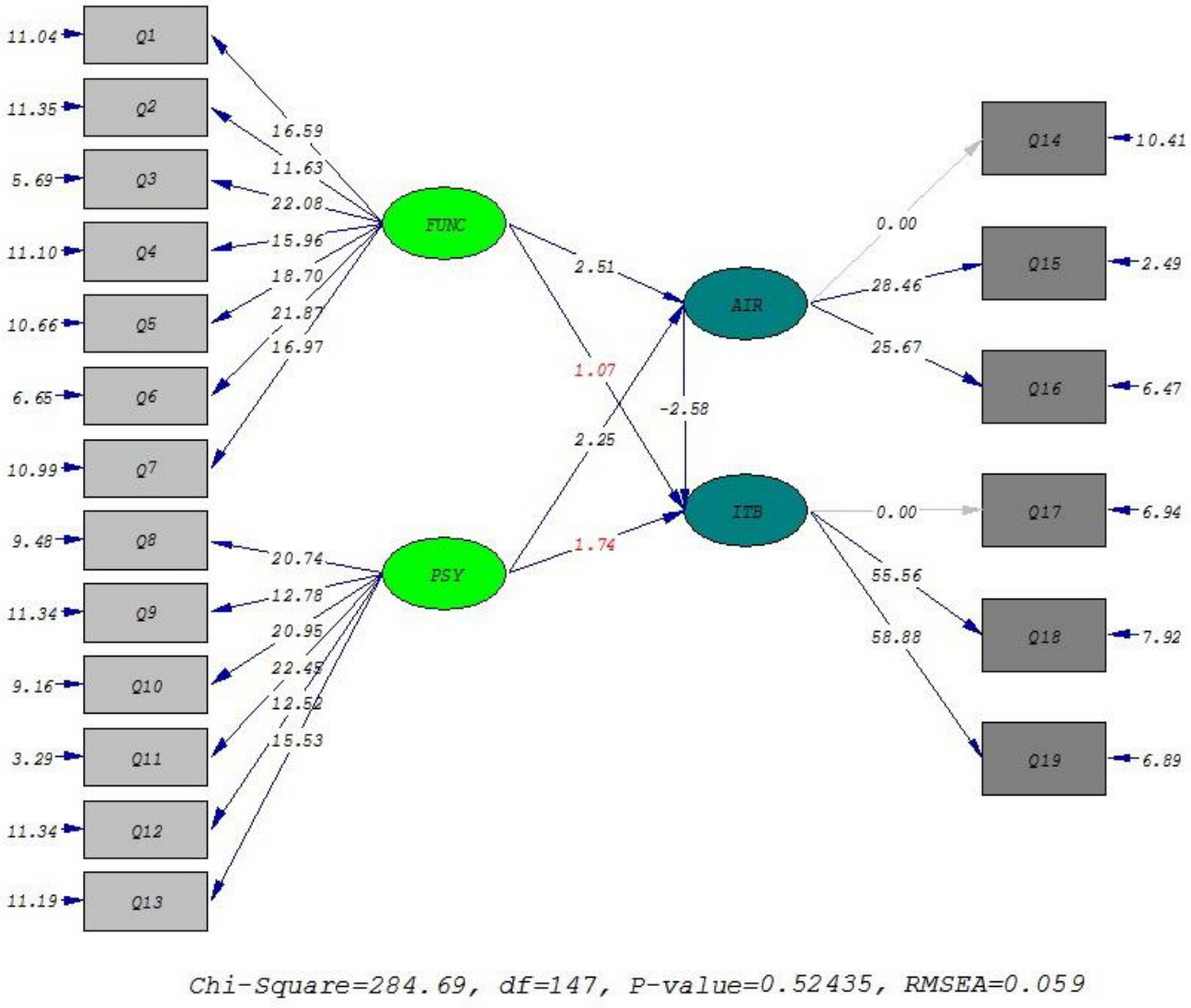


Figure 4.6- Structural Model of Research in Significant Coefficients

Table 4.13. Beta Coefficients and Significant Numbers for Primary Structural Model

Relationships between variables	Beta Coefficients	T Coefficients
Functional Barriers-Active Innovation Resistance	0.16	2.51
Psychological Barriers- Active Innovation Resistance	0.14	2.25
Functional Barriers-Intention to Buy	0.07	1.07
Psychological Barriers-Intention to Buy	0.11	1.74
Active Innovation Resistance-Intention to Buy	-0.16	-2.58

As shown in this model, Functional and psychological coefficients are significant above 2 and indicate the significance of the relationships. Thus, at 95% confidence

level, it can be said that functional and psychological factors have a positive and significant effect on innovation resistance.

Since shown in this model, Functional and psychological coefficients are not significant under 2 and indicate the insignificance of the relationships. Thus, at 95% confidence level, it can be said that functional and psychological factors have a negative and insignificant effect on Intention to Buy.

4.2.3.2.2. Modified Model

The software output indicates the suitability of the fitted structural model. In other words, observational data are largely consistent with the conceptual model of research. As shown in Table 4.14, the model fit indices to the existing situation (research model) and standard are presented.

Table 4.14. Current and Desired Status of Model's Fitness Indicators of Primary Model

Status in this Model	Desired Status	Fitting Indicator
0.059	Less than 0.08 is appropriate	RMSEA
1.93	Less than 3 is appropriate	χ^2/df
0.98	Over 90%	GFI
0.97	Over 90%	AGFI

In Table 4.14, the RMSEA and χ^2 values are appropriate and low, so the research model has a high fitness and high reliability.

4.2.3.2.2.1. Second Model-At the level of Active Innovation Resistance Factors

In this section, the effect of each of the factors of functional and psychological variables on the dependent variable (innovation resistance) is evaluated and analyzed. After analyzing the structural equations of these variables, the results can be expressed in the following diagrams.

The structural model of the research, shown in Figure 4.7 in the standard case, illustrates the relationship between exogenous and endogenous variables in the

influencing factors section. As can be seen in the figure, the path coefficients of each of the factors of functional and psychological variables are positive on Innovation Resistance which indicates the positive effect of these factors on the dependent variable

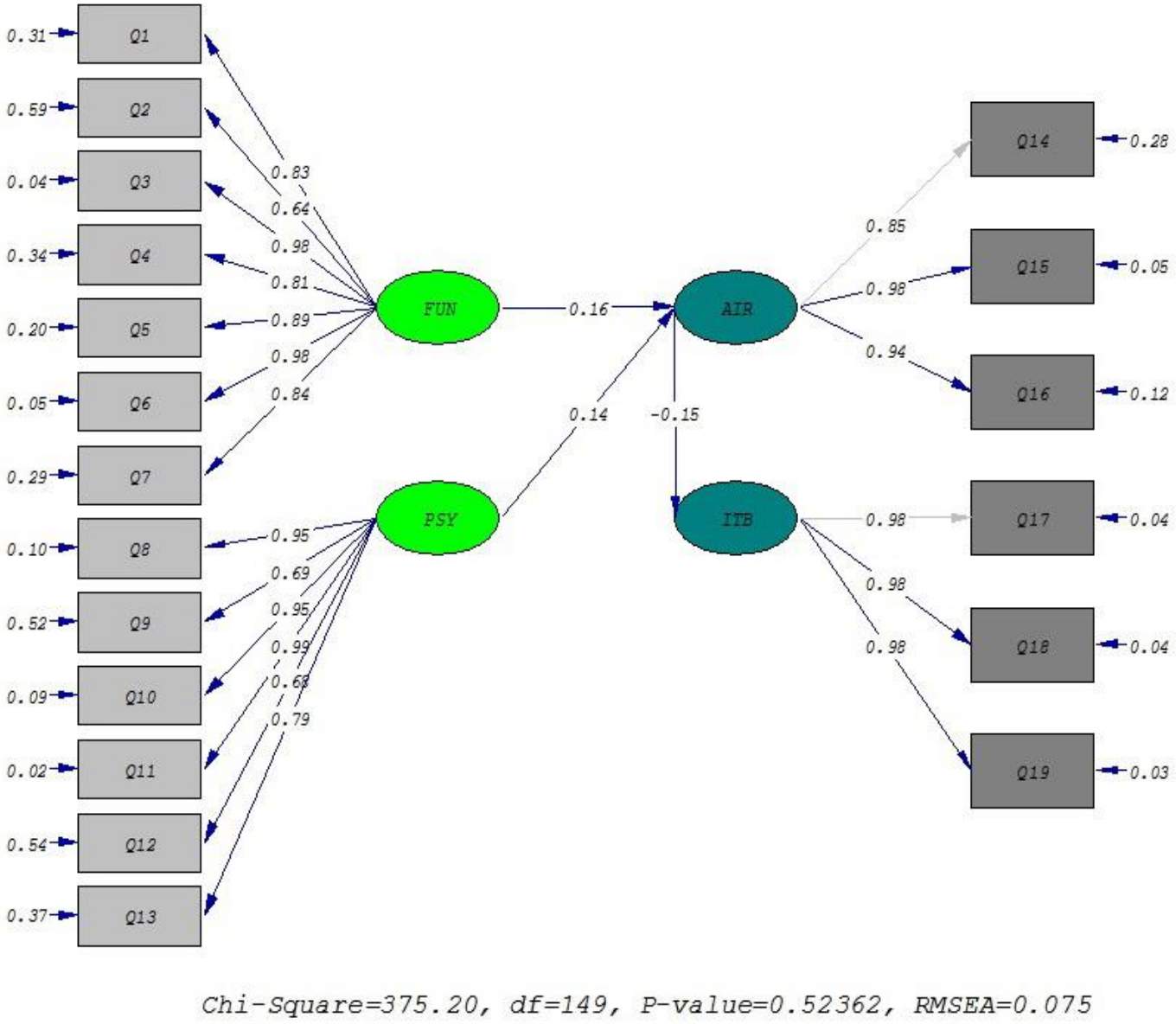


Figure 4.7. Structural model of research in standard mode

The second output, shown below, shows the significant numbers of the research model. Based on this model, the coefficients of the path coefficients can be investigated.

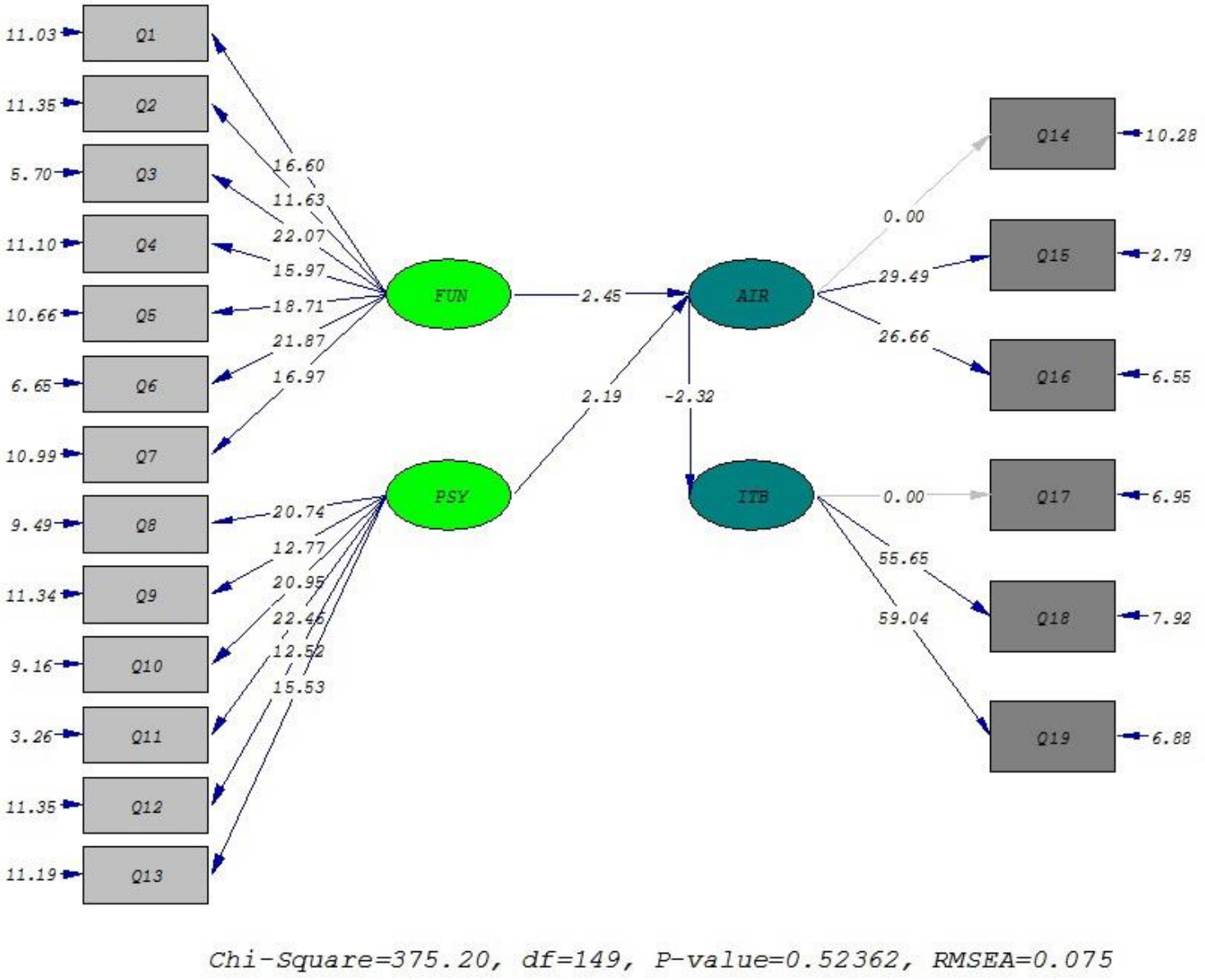


Figure 4.8. Structural Model of Research in Significant Coefficients

As shown in this model, all significant coefficients are greater than 2 and indicate the significance of the relationships. Thus, at 95% confidence level, it can be said that Functional and psychological variables have a positive and significant effect on active innovation resistance variable.

The software output indicates the suitability of the fitted structural model. In other words, observational data are largely consistent with the conceptual model of research. As shown in Table 4.15, model fit indices in the current situation (research model) and standard are presented.

Table 4.15. Current and Desired Status of Model Fitness Indicators of Second Model

Status in this Model	Desired Status	Fitting Indicator
0.075	Less than 0.08 is appropriate	RMSEA
2.51	Less than 3 is appropriate	χ^2 / df
0.94	Over 90%	GFI
0.93	Over 90%	AGFI

In Table 4.15, the RMSEA and χ^2 values are appropriate and low, so the research model is highly fitting and reliable.

In Table 4.15, path coefficients and significant numbers are considered for each, indicating the direction and severity of the relationships and providing judgment on the research hypotheses.

Table 4.16. Beta Coefficients and Significant Numbers for Modified Model

Relationships between variables	Beta Coefficients	T Coefficients
Functional Barriers-**Active Innovation Resistance**	0.16	2.45
Psychological Barriers- **Active Innovation Resistance**	0.14	2.19
Active Innovation Resistance-Intention to Buy	-0.15	-2.32

The above states indicate that all the pathways examined in the study are positive and significant, in other words, all pathways that show Functional barriers impact on Innovation resistance are positive and significant. Also, all pathways that show Psychological barriers impact on Active innovation resistance are positive and significant. And finally, all pathways that show Active Innovation Resistance impact on Intention to buy are positive and significant.

But there is not significant correlation between functional barriers and psychological barriers and intention to buy construct.

Referring to the BARON AND KENNY'S TESTS, an independent variable X affects a distal dependent variable Y through a mediating variable M, as shown in the following figure

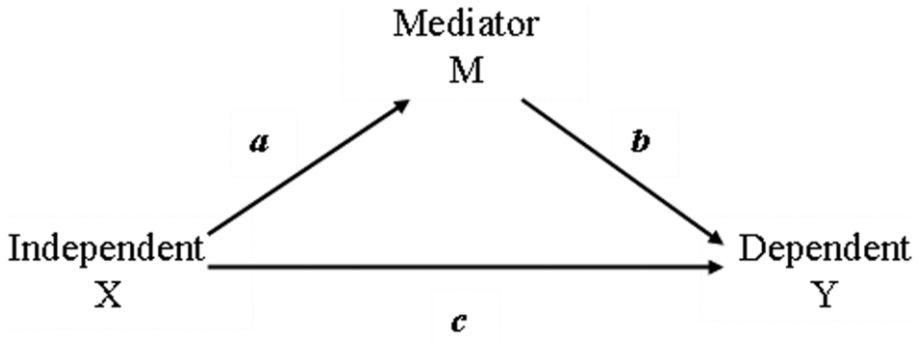


Figure 4.9. A Three-Variable Nonrecursive Causal Model(Zhao, Lynch, & Chen, 2010)

Baron and Kenny (1986) recommend three tests: A variable functions as a mediator when it meets the following conditions:

a) Variations in levels of the independent variable significantly account for variations in the presumed mediator (i.e., Path a),
b) Variations in the mediator significantly account for variations in the dependent variable (i.e., Path b), and
c) When Paths a and b are controlled, a previously significant relation between the independent and de-pendent variables is no longer significant, with the strongest demonstration of mediation occurring when Path c is zero. Baron and Kenny then state: To test mediation, one should estimate the three following regression equations:

First, regressing the mediator on the independent variable;

Second, regressing the dependent variable on the independent variable; and third, regressing the dependent variable on both the independent variable and on the mediator.

To establish mediation, the following conditions must hold. First, the independent variable must affect the mediator in the first equation. Second, the independent variable must be shown to affect the dependent variable in the second equation. Third, the mediator must affect the dependent variable in the third equation (Zhao et al., 2010).

It should be evident by now that the Baron and Kenny classification of full, partial, and no mediation is somewhat coarse and misleading due to a one-dimensional conception of mediation better seen as two-dimensional. In a non-recursive three-variable causal model, we identify three patterns consistent with mediation and two with non-mediation (Zhao et al., 2010):

1. Complementary mediation: Mediated effect (a # b) and direct effect (c) both exist and point at the same direction.
2. Competitive mediation: Mediated effect (a # b) and direct effect (c) both exist and point in opposite directions.
3. Indirect-only mediation: Mediated effect (a # b) exists, but no direct effect.
4. Direct-only non-mediation: Direct effect (c) exists, but no indirect effect.
5. No-effect non-mediation: Neither direct effect nor in-direct effect exists.

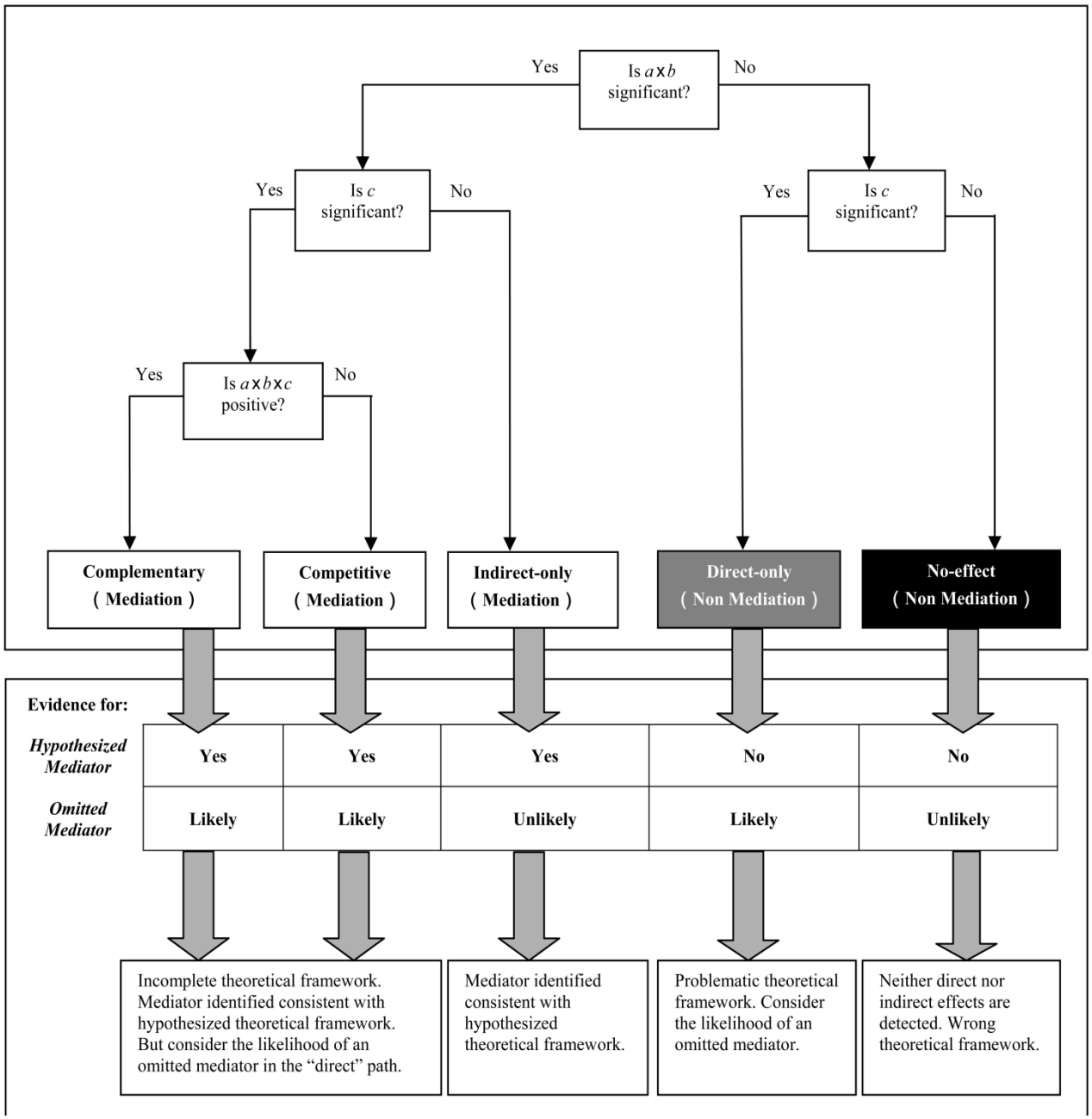


Figure 4.10. Decision tree for establishing and understanding types of mediation and nonmediation (Zhao et al., 2010)

As the Table 4-16 and the Figure 4.10 show, the important thing here is that AIR is playing the role of a Complementary mediation. The impact of Functional Barriers on Intention is mediated by (AIR). In the same way, AIR also mediates between Psychological and Intention to buy (ITB) So, it can be mentioned definitely the role of AIR is very important to keep as lower as possible AIR, in order to reduce the negative impact on customer purchasing behavior for buying an innovative product and increase his intention to buy.

4.2.4-Investigating Research Hypotheses

In this section, according to the results of data analysis, the research hypotheses are tested and tested.

Hypothesis 1: Functional Barriers have the positive and significant effect on Active Innovation resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

H0: The path coefficient between Functional barriers and Active Innovation Resistance is equal to zero.

H1: The path coefficient between Functional barriers and Active Innovation Resistance is opposed to zero.

According to the research model and Table 4.16, the positive standard coefficient value and the calculated T value are greater than 2, so the relationship between the two variables is significant, meaning that the H0 hypothesis is rejected at 95% confidence level and the hypothesis of the research is confirmed.

As a result, it can be claimed that with 95% confidence level Functional barriers have a positive and significant effect on Active Innovation resistance.

Hypothesis 2: Psychological Barriers have the positive and significant effect on Active Innovation Resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

H0: The path coefficient between Psychological barriers and Active Innovation Resistance is equal to zero.

H1: The path coefficient between Psychological barriers and Active Innovation Resistance is opposed to zero.

According to the research model and Table 4.16, the positive standard coefficient value and the calculated T value are not greater than 2, so the relationship between the two variables is significant, meaning that the H0 hypothesis is rejected at 95% confidence level and the hypothesis of the research is confirmed.

As a result, it can be claimed that with 95% confidence level Psychological barriers have a positive and significant effect on Active Innovation resistance.

Hypothesis 3: Functional Factors have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

H0: The path coefficient between Functional Factors and Intention to buy is equal to zero.
H1: The path coefficient between Functional Factors and Intention to buy is opposed to zero.

According to the research model and Table 4.13 and figures of models 4.5 and 4.6 (before modifying), the positive standard coefficient value and the calculated T value are not greater than 2, so the relationship between the two variables is not significant, meaning that the H0 hypothesis is not rejected at 95% confidence level and the hypothesis of the research is not confirmed.

As a result, it can be claimed that with 95% confidence level Functional barriers do not have a significant effect on Intention to Buy.

Hypothesis 4: Psychological Barriers have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

H0: The path coefficient between Psychological barriers and Intention to buy is equal to zero.
H1: The path coefficient between Psychological barriers and Intention to buy is opposed to zero.

According to the research model and Table 4.13, and figures of models 4.5 and 4.6 (before modifying), the positive standard coefficient value and the calculated T value are not greater than 2, so the relationship between the two variables is not significant, meaning that the H0 hypothesis is not rejected at 95% confidence level and the hypothesis of the research is not confirmed.

As a result, it can be claimed that at 95% confidence level Psychological barriers do not have significant effect on Intention to Buy.

Hypothesis 5: Active Innovation Resistance has the Negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

H0: The path coefficient between AIR and Intention to buy is equal to zero.

H1: The path coefficient between AIR and Intention to buy is opposed to zero.

According to the research model and Table 4.16, the positive standard coefficient value and the calculated T value are not greater than 2, so the relationship between the two variables is significant, meaning that the H0 hypothesis is rejected at 95% confidence level and the hypothesis of the research is confirmed.

As a result, it can be claimed that 95% confidence level Active Innovation Resistance have a positive and significant effect on Intention to buy.

A summary of the research hypothesis test results with standard value and t-value are presented in Table 4.17.

Table 4.17- Investigating and testing research hypotheses

Research hypothesis	Standard value	t-Value	Hypothesis test results
Functional barriers have a significant impact on Active Innovation Resistance (Functional. Barriers ⟶ AIR)	0.16	2.51	Hypothesis Accepted
Psychological barrier has a significant impact on Active Innovation Resistance (Psychological Barriers ⟶ AIR)	0.14	2.25	Hypothesis Accepted
Functional barriers have a significant impact on Intention to buy (Functional. Barriers ⟶ ITB)	0.07	1.07	Hypothesis Rejected
Psychological barriers have a significant impact on Intention to buy (Psychological Barriers ⟶ ITB)	0.11	1.74	Hypothesis Rejected
Active Innovation Resistance has a significant impact on Intention to Buy (AIR ⟶ ITB)	-0.16	-2.58	Hypothesis Accepted

So, based on the results of hypothesis and the conceptual model mentioned in chapter 2 (Figure 2.8) the final model of the thesis can be confirmed as follows:

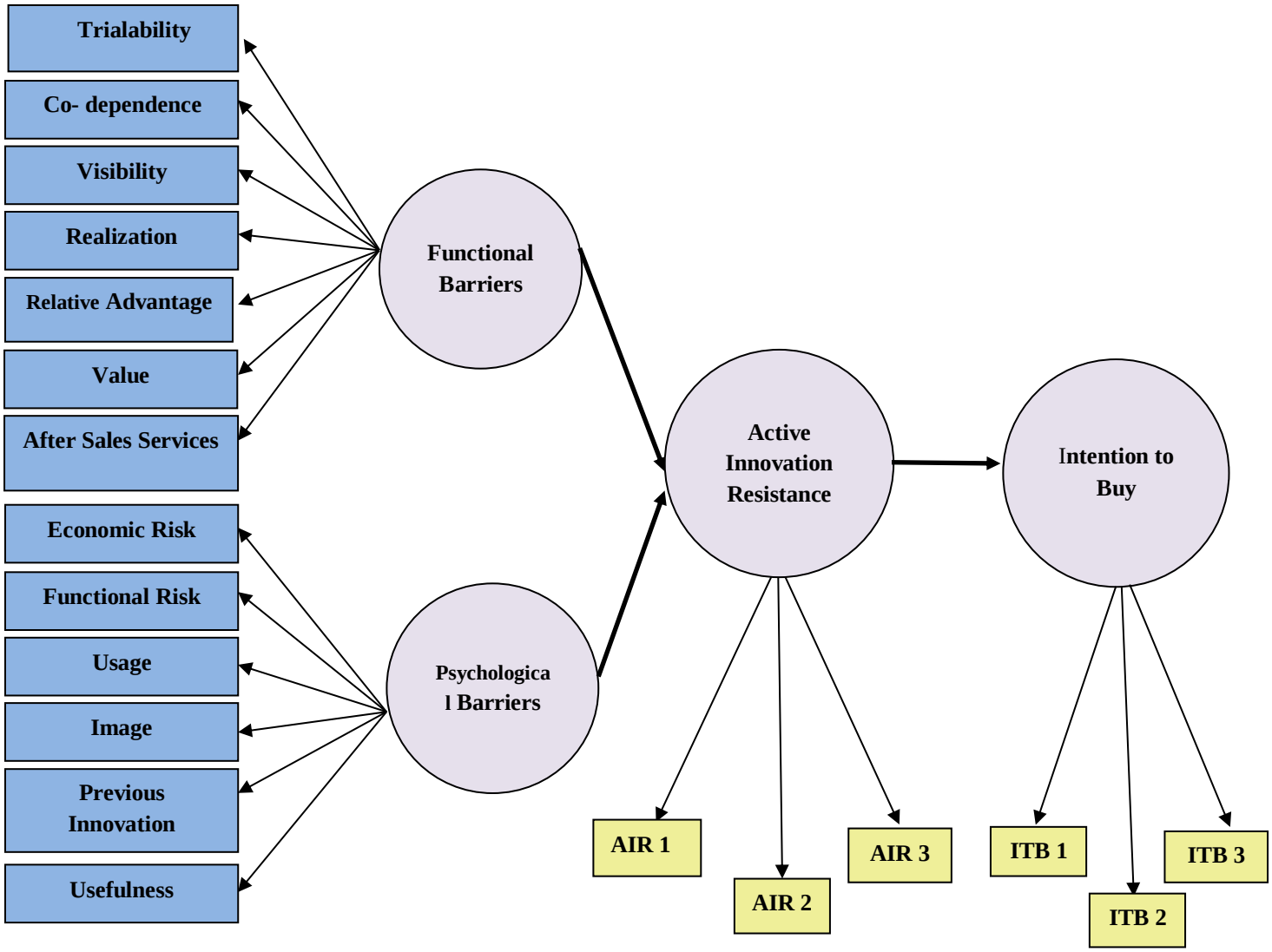


Figure 4.11. Final Model of The Research

Due to the fact that there is a significant path between AIR and ITB, so AIR play a mediator role between barriers and ITB. It can be implied that all effect on ITB comes AIR which is in direct influence of Functional and psychological Barriers which is directly in effect of 13 innovation resistance factors.

4.2.5- One-Way ANOVA

The one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of three or more independent (unrelated) groups.

The one-way ANOVA compares the means between the groups you are interested in and determines whether any of those means are statistically significantly different from each other. Specifically, it tests the null hypothesis:

$$H_0: \mu_1 = \mu_2 = \mu_3 = \cdots = \mu_k$$

Where μ = group mean and k = number of groups. If, however, the one-way ANOVA returns a statistically significant result, we accept the alternative hypothesis (H_A), which is that there are at least two group means that are statistically significantly different from each other.

At this point, it is important to realize that the one-way ANOVA is an omnibus test statistic and cannot tell you which specific groups were statistically significantly different from each other only that at least two groups were. To determine which specific groups differed from each other, you need to use a post hoc test.

Post hoc tests are an integral part of ANOVA. When you use ANOVA to test the equality of at least three group means, statistically significant results indicate that not all of the group means are equal. However, ANOVA results do not identify which particular differences between pairs of means are significant. Use post hoc tests to explore differences between multiple group means while controlling the experiment-wise error rate.

4.2.5.1- ANOVA of the effect of Age on endogenous variable of Active Innovation Resistance (AIR)

Age is a 5-part nominal variable (20 to 30, 30 to 40, 40 to 50, 50 to 60 and over 60), so one-way analysis of variance (ANOVA) should be used to demonstrate the impact of this variable on endogenous variable of Active Innovation Resistance. For this purpose, the statistical hypothesis is as follows:

The mean of endogenous variables varied across age groups

H0: $\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5$

The mean of endogenous variables in different age groups are similar

H1: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4 \neq \mu 5$

Analysis of variance for endogenous variable (Active Innovation Resistance) was performed separately and the mean of this variable was compared by different age groups.

Table 4.18. ANOVA Test Summary of Age Groups

AIR (Active Innovation Resistance)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	273.721	4	68.430	5.976	.000
Within Groups	2977.237	260	11.451		
Total	**3250.958**	**264**			

The summary of the ANOVA test is presented in Table 4.18. As Table 4.18 shows, the calculated error in the last column for the innovation resistance variable (.000) is less than the level of conventional error (0.05).

Therefore, with the available information, the null hypothesis can be rejected. So, the mean difference was significant and with 95% confidence we can say that:

The mean of innovation resistance of different age groups was significantly different, so it means that the innovation resistance in all age groups is not equal. So, in order to determine which specific groups differed from each other, a post hoc test is needed.

4.2.5.1.1- Post Hoc Test of Age on endogenous variable of Active Innovation Resistance

Regarding the result of ANOVA test for age of different groups of respondents, since the mean of innovation resistance of different age groups was significantly different, so it means that the innovation resistance in all age groups is not equal.

To determine which specific groups differed from each other, we need to use a post hoc test as explained in Table 4.19.

Table 4.19. Post Hoc Test of Age Groups

Multiple Comparisons

Dependent Variable: AIR

Tukey HSD

(I) AGE	(J) AGE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-1.24871	.47891	.072	-2.5643	.0669
	3	-2.82941*	.68666	.000	-4.7157	-.9431
	4	-.40358	.79535	.987	-2.5884	1.7813
	5	-6.44706	2.42078	.062	-13.0970	.2029
2	1	1.24871	.47891	.072	-.0669	2.5643
	3	-1.58070	.65683	.117	-3.3850	.2236
	4	.84513	.76974	.808	-1.2694	2.9596
	5	-5.19835	2.41249	.200	-11.8255	1.4288
3	1	2.82941*	.68666	.000	.9431	4.7157
	2	1.58070	.65683	.117	-.2236	3.3850
	4	2.42583	.91360	.064	-.0838	4.9355
	5	-3.61765	2.46216	.583	-10.3813	3.1460
4	1	.40358	.79535	.987	-1.7813	2.5884
	2	-.84513	.76974	.808	-2.9596	1.2694
	3	-2.42583	.91360	.064	-4.9355	.0838
	5	-6.04348	2.49466	.113	-12.8963	.8094
5	1	6.44706	2.42078	.062	-.2029	13.0970
	2	5.19835	2.41249	.200	-1.4288	11.8255
	3	3.61765	2.46216	.583	-3.1460	10.3813
	4	6.04348	2.49466	.113	-.8094	12.8963

*. The mean difference is significant at the 0.05 level.

As Table 4.18 shows, since the calculated error in the column of Sig. for the innovation resistance variable (.000) is less than the level of conventional error (0.05). For age category of 20-30 and also for the age category of 40-50, so it can be significantly confirmed that the Active innovation resistance of customers against an innovative car in first age group of 20-30 and 40-50 is significant, it means this age category demonstrate more resistance to innovative car in comparison to other age groups.

4.2.5.2- ANOVA of the effect of Education on endogenous variable of Active Innovation Resistance

Education is a 5-part nominal variable (Under secondary school, Secondary school, Bachelor, Master and Ph.D.), so one-way analysis of variance (ANOVA) should be used to demonstrate the impact of this variable on endogenous variable of Innovation Resistance. For this purpose, the statistical hypothesis is as follows.

The mean of endogenous variables varied across Education groups

H0: $\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5$

The mean of endogenous variables in different Education groups are similar

H1: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4 \neq \mu 5$

Analysis of variance for endogenous variable (Active Innovation Resistance) was performed separately and the mean of this variable was compared by different Education groups.

Table 4.20. ANOVA Test Summary of Education Groups

AIR (Active Innovation Resistance)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	144.704	4	36.176	3.028	.018
Within Groups	3106.254	260	11.947		
Total	**3250.958**	**264**			

The summary of the ANOVA test is presented in Table 4.19. The calculated error in the last column for the innovation resistance variable (.018) is less than the level of conventional error (0.05).

Therefore, with the available information, the null hypothesis can be rejected. So, the mean difference was significant and with 95% confidence we can say that:

The mean of innovation resistance of different education groups was significantly different, so it means that the innovation resistance in all education groups is not

equal. To determine which specific groups differed from each other, we need to use a post hoc test as explained in following Table.

4.2.5.2.1- Post Hoc Test of Education on endogenous variable of Active Innovation Resistance.

Regarding the result of ANOVA test for education of different groups of respondents, since the mean of innovation resistance of different education groups was significantly different, so it means that the innovation resistance in all Education groups is not equal. To determine which specific groups differed from each other, we need to use a post hoc test so, in order to determine which specific groups differed from each other, you need to use a post hoc test.

Table 4.21. Post Hoc Test of Education Groups: Dependent Variable: AIR Tukey HSD

(I) EDU	(J) EDU	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-.28187	.87266	.998	-2.6791	2.1154
	3	-1.77337	.87713	.258	-4.1829	.6361
	4	-1.50992	.90810	.459	-4.0045	.9847
	5	-2.22632	1.35037	.468	-5.9358	1.4832
2	1	.28187	.87266	.998	-2.1154	2.6791
	3	-1.49150*	.52278	.037	-2.9276	-.0554
	4	-1.22805	.57324	.205	-2.8027	.3466
	5	-1.94444	1.15215	.443	-5.1094	1.2205
3	1	1.77337	.87713	.258	-.6361	4.1829
	2	1.49150*	.52278	.037	.0554	2.9276
	4	.26345	.58001	.991	-1.3298	1.8567
	5	-.45294	1.15554	.995	-3.6272	2.7213
4	1	1.50992	.90810	.459	-.9847	4.0045
	2	1.22805	.57324	.205	-.3466	2.8027
	3	-.26345	.58001	.991	-1.8567	1.3298
	5	-.71639	1.17922	.974	-3.9557	2.5230
5	1	2.22632	1.35037	.468	-1.4832	5.9358
	2	1.94444	1.15215	.443	-1.2205	5.1094
	3	.45294	1.15554	.995	-2.7213	3.6272
	4	.71639	1.17922	.974	-2.5230	3.9557

* The mean difference is significant at the 0.05 level.

As Table 4.20 shows, since the calculated error in the column of Sig. for the innovation resistance variable (.037) is less than the level of conventional error (0.05) for Education category of Secondary school and also for the Education category of Bachelor, so it can be significantly confirmed that the Active innovation resistance of customers against an innovative car in second Education group of Secondary school and also customers with education category of Bachelor is significant, it means this Education categories demonstrate more resistance to innovative car in comparison to other Education groups.

4.2.5.3- ANOVA of the effect of Income on endogenous variable of Active Innovation Resistance

Income is a 5-part nominal variable (Under 650 Euros, 650-1200 Euros, 1200-1600 Euros, 1600-2000 Euros and more than 2000 Euros), so one-way analysis of variance (ANOVA) should be used to demonstrate the impact of this variable on endogenous variable of Innovation Resistance. For this purpose, the statistical hypothesis is as follows.

The mean of endogenous variables varied across Income groups

H0: $\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5$

The mean of endogenous variables in different Income groups are similar

H1: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4 \neq \mu 5$

Analysis of variance for endogenous variable (innovation resistance) was performed separately and the mean of this variable was compared by different Income groups.

Table 4.22.ANOVA Test Summary of Income Groups

AIR (Active Innovation Resistance)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	180.062	4	45.015	3.811	.005
Within Groups	3070.897	260	11.811		
Total	3250.958	264			

The summary of the ANOVA test is presented in Table 4.21. The calculated error in the last column for the innovation resistance variable (.005) is less than the level of conventional error (0.05). Therefore, with the available information, the null hypothesis can be rejected. So, the mean difference was significant and with 95% confidence we can say that:

The mean of innovation resistance of different Income groups was significantly different, so it means that the innovation resistance in all Income groups is not equal. So, in order to determine which specific groups differed from each other, you need to use a post hoc test.

4.2.5.3.1- Post Hoc Test of Income on endogenous variable of Active Innovation Resistance

Regarding the result of ANOVA test for Income of different groups of respondents, since the mean of innovation resistance of different Income groups was significantly different, so it means that the innovation resistance in all Income groups is not equal.
To determine which specific groups differed from each other, we need to use a post hoc test.

Table 4.23. Post Hoc Test of Income Groups. Dependent Variable: AIR Tukey HSD

(I) INC	(J) INC	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.20526	.52890	.995	-1.2476	1.6582
	3	.27193	.60218	.991	-1.3823	1.9261
	4	-2.05526	.86369	.124	-4.4278	.3173
	5	-2.36997	.92205	.079	-4.9029	.1629
2	1	-.20526	.52890	.995	-1.6582	1.2476
	3	.06667	.57580	1.000	-1.5151	1.6484
	4	-2.26053	.84551	.061	-4.5832	.0621
	5	-2.57523*	.90504	.038	-5.0614	-.0891
3	1	-.27193	.60218	.991	-1.9261	1.3823
	2	-.06667	.57580	1.000	-1.6484	1.5151
	4	-2.32719	.89318	.072	-4.7808	.1264
	5	-2.64190*	.94973	.046	-5.2508	-.0330
4	1	2.05526	.86369	.124	-.3173	4.4278
	2	2.26053	.84551	.061	-.0621	4.5832
	3	2.32719	.89318	.072	-.1264	4.7808
	5	-.31471	1.13372	.999	-3.4291	2.7997
5	1	2.36997	.92205	.079	-.1629	4.9029
	2	2.57523*	.90504	.038	.0891	5.0614
	3	2.64190*	.94973	.046	.0330	5.2508
	4	.31471	1.13372	.999	-2.7997	3.4291

* The mean difference is significant at the 0.05 level.

As Table 4.22 shows, since the calculated error in the column of Sig. for the innovation resistance variable (.038) and (.046) are less than the level of conventional error (0.05).

For Income category of 650-1200 Euros, 1200-1600 Euros and also for the Income category of more than 2000 Euros is significant, so it can be significantly confirmed that the Active innovation resistance of customers against an innovative car with Income category of 650-1200 Euros, 1200-1600 Euros and also for the Income category of more than 2000 Euros is significant, it means these Income categories demonstrate more resistance to innovative car in comparison to other Income groups.

CHAPTER 5- CONCLUSIONS & RENDERING COMMUNICATIONS

5.1- Introduction

Reporting is the process of communicating the findings using methods based on scientific criteria, taking into account ethical considerations, and ultimately presenting the results as a written product. The purpose of reporting is to present important and reliable findings to other researchers or to the community.

In this chapter, based on the issues raised in the research data analysis section and the overlapping discussions with conceptual concepts and categories, the final conclusions will be based on research assumptions, as well as strategies based on research findings for improvement. We will provide organizational learning conditions.

As stated in the first chapter of this research, the main purpose of this research is to investigate the effects of some factors on active innovation resistance and finally render a model of these factors in automotive industry of Iran.

For this purpose, using experimental research approach, the required data and information were collected through post-test and then analyzed by descriptive and inferential statistics technique.

The research model is based on the subject literature and theoretical analysis reported in the second chapter. The most important components of the research model include the two main variables of functional and psychological factors and Active Innovation resistance, as well as the dimensions of each of these variables which are completely theoretical.

The results of this research are presented while reviewing the data analysis and considering the research hypotheses.

Two main factors were considered as possible drivers of resistance to innovation: (1) Functional Barriers; (2) Psychological barriers; and these are related to so many factors influencing these independent variables. And two dependent variables such as Active innovation resistance and intention to buy as a main construct of model are studied and validated as models identified in previous chapter of 4. Table 5.1- further specifies the key findings in this research

Table 5.1. Summary of key findings

Phase	Research Questions	Key Findings
1 (Qualitative)	What are the factors influencing on Innovation Resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?	Based on Literature review and Delphi method, the crucial factors of Functional, Psychological barriers and finally personal factors are extracted (questionnaire of Appendix A)
2 (Quantitative)	**Main Research Question 1:** What is the effect of identified factors on Innovation Resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?	The effect of identified factors such as Functional and Psychological barriers on Active innovation resistance and intention to buy are mentioned in Tables 4.3,4.4,4.5 & 4.6
	Minor Research Question1-1: What is the effect of Functional factors on Innovation Resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?	The effect of functional factors on Active innovation resistance is mentioned in Table 4.3
	Minor Research Question 1-2: What is the effect of Psychological factors on Innovation Resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?	The effect of Psychological factors on Active innovation resistance is mentioned in Table 4.4
	Main Research Question 2: What is the effect of identified factors on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?	The effect of factors ITB1, ITB2 & ITB3 on Active innovation resistance is mentioned in Tables 4.6
	Minor Research Question 2-1: What is the effect of Functional factors on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?	There is no significant correlation between Functional factors and intention to buy for purchasing innovative passenger vehicles
	Minor Research Question 2-2: What is the effect of Psychological factors on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?	There is no significant correlation between Psychological factors and intention to buy for purchasing innovative passenger vehicles
	Main Research Question 3: What is the effect of Innovation Resistance on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran?	Based on the Table 4.10 there is a significant correlation between AIR and ITB

Table 5.2.The effect of Functional and Psychological Factors on Active Innovation Resistance and intention to Buy

Factor	Active innovation Resistance (AIR)	Intention to Buy (ITB)
Functional Barriers	YES	NO
Psychological Barriers	YES	NO

Table 5.3. The Results of ResearchHypotheses in Brief

Hypothesis	Title	Accepted	Rejected
H1	Functional Barriers have the positive and significant effect on Active Innovation resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.	**YES**	
H2	Psychological Barriers have the positive and significant effect on Active Innovation resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.	**YES**	
H3	Functional Barriers have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran		**YES**
H4	Psychological Barriers have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran		**YES**
H5	Active Innovation Resistance has the Negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.	**YES**	

5.2-The Comparison of the results with the models mentioned in the research background

In addition, the theoretical generalizations of the extracted model are examined while comparing the research findings with the research background. The background is based on the issues raised in Chapter Two.

A summary of the issues raised in the research background that underlies the present research is presented in the table 5.4. In this table, the research background is compared with the research findings and the results are presented.

Table 5.4. The Comparison of the results with the models mentioned in the research background

Reference	Description of Research	Compared with the Research Findings
RAM's Model	All of functional and psychological factors have different nature of effect on different products and industries, as there is no evidence that these factors are all applicable and have the same effects on different products. Suggests a relationship between unfavorable and also, a relationship between economical risk and Innovation resistance. This type of risk is expected to be especially relevant for technology-related innovation. Consumers will speculate about future lower prices, which lead to postponement(Ram, 1989b)	Although one of the conclusions of RAM's research is about the relationship between functional and psychological factors, it is similar to the results of our study since it has shown the effect of functional and psychological factors on innovation resistance (strong and significant). The findings of our study confirm the results of this research as well.
(Talke & Heidenreich, 2014)	It is suggested that active innovation resistance results primarily from innovation-specific barriers; Functional barriers arise as soon as a consumer perceives any product attributes as dysfunctional or inadequate for his or her personal needs and usage expectations; In sum, it is proposed that active innovation resistance is driven by both innovation-specific functional and psychological barriers that result from unfavorable new product evaluations (Talke & Heidenreich, 2014)	One of the conclusions of Talke and Heidenreich's research is about the relationship between functional and psychological factors and the AIR is driven by both Functional and Psychological barriers. It is similar to the results of our study since it has shown the effect of functional and psychological factors on innovation resistance (strong and significant). The findings of our study confirm the results of this research as well
(Szmigin & Foxall, 1998)	Consumers postpone adoption until they are assured that the innovation functions properly; It is suggested that innovation resistance can no longer be regarded as a potentially negative aspect of target markets for new goods and services but rather a response based on rational choices. (Szmigin & Foxall, 1998)	Since this research as well is studying the effect of functional and psychological factors on intention to buy, it clearly should that directly there is no significant relationship between functional and psychological factors and intention to buy, it means that customers are not considering to purchase the innovative product, or

Reference	Description of Research	Compared with the Research Findings
		purchase it when they need it or finally they will purchase it soon, since this innovative product is not commodity product and it is long term use product as it is a vehicle and they cannot plan about this purchase ASA other low price commodity goods. The findings of our study confirm the results of this research as well
Joachim (Joachim et al., 2018)	This research has shown that AIR barriers including Functional and psychological barriers decrease the intention to adopt an innovation. The results of Joachim research also demonstrate that functional and psychological barriers vary in their effect on adoption intention which depends on whether a new product or service gets evaluated. Also, the results suggest that managers should invest on innovations in relation to these barriers, which can come true by evaluating product innovations. So, managers should assume that the intention to adopt decreases to nine functional barriers (**value**, communicability, **trialability**, amenability, compatibility, complexity, visibility, realization and **Co-Dependence** barriers) and eight psychological barriers (norm, usage, image and information barrier as well as risk barriers: economic, social, functional and personal risk). Companies should follow a two-step procedure in order to be able to address the relevant barriers as each barrier's relative importance varies between innovation rejections assessment contexts. First, all 17	This study as well retrieved functional and psychological factors affecting active innovation resistance in auto industry with implying that functional barriers including (**Trialability**, Co-Dependence, Visibility, Realization, Relative advantage, **Value** and **after sales services** which has been added to this barrier in comparison with Joachim research and regarding Psychological barriers (Economic risk, Functional risk, usage, Image, Previous innovation experience and usefulness) are extracted from this research influencing on Active Innovation Resistance so the findings of our study confirm the results of this research as well

Reference	Description of Research	Compared with the Research Findings
	AIR barriers should initially be used to assess their influences on the intention to adopt in the target market. The results of such a study could reveal that a set of predominant barriers represents the primary driver of innovation rejection. Second, a further study should reveal measures to reduce these predominant barriers. Such a procedure could prevent practitioners from ignoring predominant barriers and guide them to manage their limited resources in order to efficiently address the dominant reasons against adoption(Joachim et al., 2018)	
Claudy (Claudy et al., 2014)	Research has shown that AIR barriers decrease the intention to adopt an innovation. One criticism of recent literature calls into question the generally accepted assumption that AIR encompasses five distinct barriers that inhibit new product adoption. This research aims to address this shortcoming by applying a novel consumer behavior model (i.e., behavioral reasoning theory) to test the relative influence of both reasons for and, importantly, Reasons against adoption in consumers' innovation adoption decisions. Based on two empirical studies, one with a product and a second with a service innovation, findings demonstrate that behavioral reasoning theory provides a suitable framework to model the mental processing of innovation adoption. Implications for managers and researchers are discussed.(Claudy et al., 2014)	Although one of the conclusions of Claudy's research is about the Diffusion of innovation in two aspects of product and service, and some factors of functional and psychological factors such as value, Image and usage are confirmed by Claudy research and this research as well and it is similar to the results of our study so some of the findings of our study confirm the results of this research as well.

As can be seen in the table above, the main results of the research (impact of Functional and Psychological factors on Active Innovation Resistance) were compared with the findings of the research, and the theoretical adequacy of the research model can be seen.

5.3-Recommendations

Based on the findings of the research in the main model and in the factors influencing on the Active Innovation Resistance in two aspects of Functional and Psychological ones in the automotive industry, the following suggestions are suggested to use the results of this research.

5.3.1- Recommendation based on the First hypothesis

Hypothesis 1: Functional barriers have the positive and significant effect on Active Innovation resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

Since this study confirms the positive and significant relationship between Functional Barriers and active innovation resistance in purchasing innovative cars in Iranian automotive industry, it is suggested that other companies consider Functional Barriers before attempting to produce innovative cars and obtain Useful results by using this model.

Considering that the functional barriers in this research encompassing these factors such as:

Trialability (Perception of missing possibilities to try an innovation in general, in a specific setting or over the preferred period of time) (Talke & Heidenreich, 2014).
Co-Dependence (Perception that the innovation as incomplete or there is a strong need to supplement it with additional parts or services) (Kuisma et al., 2007)
Visibility (Perceived difficulties in observing the innovation in use)(Joachim et al., 2018).
Realization (Evaluation that the time-span before an innovation results in a beneficial outcome is too long)(Ram, 1989a; Talke & Heidenreich, 2014).
Relative advantage (an innovation may not be in the form of economic gain or in the form of cost savings) (Gatignon & JEAN-MARC XUEREB, 1997; Rogers, 2003b).
Value (Perceived lack of relative advantage or superior performance by the innovation over existing alternatives or even the degree to which an innovations' value-to-price ratio is perceived

in relation to other product substitutes) (Hoeffler, 2003; Molesworth;Suortti, 2002; Ram & Sheth, 1989).

After Sales Services Since these factors have been identified as important Functional factors influencing on active innovation resistance, it is recommended that in order to achieve better results in reducing customers' resistance over innovative products, managers or nominated marketers should allow customers to:

- Test new innovative cars (in this research) or totally all new innovative products before purchasing it
- Should explain to customers that at the moment purchasing this vehicle, there is no need to supplement this purchase with additional products, parts or services.
- Closely observe the vehicle is working without any difficulties in comparison with existing vehicles or their current vehicle.
- Evaluate the innovative vehicle in a limited time-span in order to understand beneficial outcome of that accordingly.
- Understand that this innovative car will bring economic gain by its cost reducing new changes and it is kind of cost saving which can be clarified by related marketers.
- Perceive superior performance by the innovative car over existing alternatives or his current car in comparison with the assigned price.
- Observe that not only this innovative car is a kind of cost saving over the current substitute in long term use, but also the availability of spare parts and also after sales services with define mileages guarantee and also parts warrantee is fully supported by manufacturer.

One of the steps that can be taken in this regard is to reduce the aforementioned functional barriers in order to increase sales rate and achieve profits of innovation goals of organization.

5.3.2- Recommendation based on the Second hypothesis:

Hypothesis 2: Psychological barriers have the positive and significant effect on Innovation resistance for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

Since this study confirms the positive and significant relationship between Psychological Barriers and active innovation resistance in purchasing innovative cars in Iranian automotive industry, it is suggested that other companies consider

Psychological Barriers before attempting to produce innovative cars and obtain Useful results by using this model.

Considering that the functional barriers in this research encompassing these factors such as:

Economic risk (it represents a bad value for money) (Ram & Sheth, 1989; Talke & Heidenreich, 2014).
Functional risk (fearing that a product could be dysfunctional or mal-functional)(Joachim et al., 2018; Ram & Sheth, 1989; Talke & Heidenreich, 2014).
Usage (Innovation's inconsistencies with past experiences that threaten to disrupt established usage patterns) (Hoeffler, 2003; Ram & Sheth, 1989)
Image (The innovation's identity (from its origin) like the product category, brand, or the country of origin) (Kuisma et al., 2007; Ram & Sheth, 1989)
Previous Innovation Experience (Bad Previous experiences that customer has based on innovative products)(Ram, 1989a)
Usefulness (The consumer's perception that a product or service does not provide a benefit that fulfills his/her needs) (Henard& Szymanski, 2001; S. Lee et al., 2011; Li et al., 2014; Moldovan et al., 2011).

Since these factors have been identified as important Psychological factors influencing on active innovation resistance, it is recommended that in order to achieve better results in reducing customers' resistance over innovative products, with help of some psychologists, our managers or nominated marketers should allow customers to:

- Feel that this innovative car finally represents a good value for his money by explaining the added value of this innovative product.
- Know that this innovative product will have a very perfect function by showing its operation in details and letting customer to check the operation of car himself.
- Feel that this innovative product will not disrupt their establish usage pattern by explaining the existence of similarity between their current vehicle and the easier use pattern for this new car.
- Understand the operation of this innovative product by customer by hiding the logo/Brand or origin of country of the vehicle, in order to do this important step correctly it is kindly recommended to perform it in Car Clinic platform.

- Feel that by testing this new innovative vehicle before purchasing it and getting the experience of driving this vehicle before making the final purchase decision, the Bad Previous experiences will not be repeated again.
- Get this perception that innovative car provides a benefit that fulfills his/her needs as he expects

So, by reducing the aforementioned psychological barriers, manufacturers increase sales rate and achieve profits of innovation goals of organization

5.3.3- Recommendation based on the Third hypothesis:

Hypothesis 3: Functional barriers have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

As per the final Model of this study, there is not significant correlation between Functional Barriers and intention to buy so it can be claimed that Functional barriers have an insignificant effect on Intention to Buy

5.3.4- Recommendation based on the fourth hypothesis:

Hypothesis 4: Psychological barriers have the negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.

As per the final Model of this study, there is not significant correlation between Psychological Barriers and intention to buy so it can be claimed that Psychological barriers have an insignificant effect on Intention to Buy

5.3.5- Recommendation based on the fifth hypothesis:

Hypothesis 5: Active Innovation Resistance has the Negative and significant effect on Intention to buy for purchasing innovative Passenger Vehicles in Automotive Industry of Iran.
Since this study confirms the positive and significant relationship between Active Innovation Resistance and Intention to buy for purchasing innovative cars in Iranian automotive industry, it is suggested that other companies attempt to produce innovative cars by decreasing the following concerns of customers:

- In sum, a possible purchase of it would cause problems that I don't need (Wiedmann et al., 2011).
- I would be making a mistake by purchasing it.
- In the near future, the purchase would be connected with too many uncertainties.

And also, it is suggested that other companies attempt to produce innovative cars by increasing the following interests of customers:

- I am considering purchasing this product (Shihab & Putri, 2018).
- I will purchase this product when I need it.
- I will purchase this product soon.

Findings lead to some conclusions. First one is that functional and Psychological barriers are really impacting on AIR and AIR directing influencing on Intention to buy. Therefore, in order to impact on consumer behavior (intention to buy), the only way is through AIR, since functional and psychological Barriers are directly influencing on AIR, so each one of the 13 list items should be considered in order to drop any barrier. Additionally, taking a pro-active attitude, managers might consider positive actions to stimulate the functional and psychological effect.

5.4-Theoritical Implications

This study has shown that Functional and Psychological barriers increase the innovation resistance and by increasing the innovation resistance, intention to purchase decrease.

In order to obtain this controversial issue, we provided both first qualitative and then quantitative research for the importance of finding these crucial factors of AIR barriers. In doing so, this study has produced several notable findings that might contribute to consumer purchasing behaviors in general and research on active innovation resistance in specific.

First, this study contributes to the discussion on the factors influencing on Innovation resistance by clarifying the most important factors extracting from the results of qualitative method and finding the most effective barriers when explaining consumer rejection behavior.

Within this respect, Talke and Heidenreich (2014) developed a typology of nine functional and eight psychological barriers of AIR to expand the current understanding of why innovations are actively rejected (Joachim et al., 2018; Talke & Heidenreich, 2014).

Regarding the first phase of this research from 33 factors influencing active Innovation resistance and acting as barriers in this issue, about 13 factors collected as important factors by two main barriers title of functional and psychological barriers which was replied by 13 people encompassing panel of experts and based on the previous studies and studying the constructs of AIR and ITB finally 19 factors answered in the next step of quantitative phase of study by 265 people of 3 automotive clients who had resisted against innovation.

However, one of the functional barriers, namely after sales services barrier, was mentioned by the participants relying on previous literature findings as are mainly used in this research (Claudy et al., 2014; Joachim et al., 2018; Mani & Chouk, 2018; Talke & Heidenreich, 2014).

The results recommend that all 19 AIR factors are relevant in the context of consumer innovation resistance in a way that they significantly contribute to the decision to reject an innovation.

By the results achieved, it is obvious now that "Active Innovation Resistance" plays a paramount mediation Role in order to achieve "Intention to Buy". There is no direct effect from "Functional barriers" to "Intention to Buy", nor from "Psychological Barriers" to "Intention to Buy ". The only way to reach "Intention to Buy" is through "Active Innovation Resistance".

The important thing here is that AIR is playing the role of a complementary mediation. The impact of Functional Barriers on Intention is mediated by AIR. In the same way, AIR also mediates between Psychological and Intention to buy (ITB). So, it can be mentioned definitely the role of AIR is very important to keep as lower as possible AIR, in order to reduce the negative impact on customer purchasing behavior for buying an innovative product and increase his intention to buy. Although we introduce this implication in this subsection, it is obvious that it also has its homologous repercussion in the managerial side.

5.5-Managerial Implications

Conclusion are drawn after a deep reading to all previous results. This fresh new view of all together provides some additional contributions and interesting consequences. The holistic view of it provides valuable implications for both academics and practitioners.

First, looking back again to the original research model (Figure 2.8), and to the results achieved, it is obvious now that "Active Innovation Resistance" plays a paramount mediation Role in order to achieve "Intention to buy". There is no direct effect from "Functional barriers" to "Intention to Buy", nor from "Psychological Barriers" to

"Intention to Buy ". The only way to reach "Intention to Buy" is through "Active Innovation Resistance".

According to the notation of Zhao et al., (2010), there are two indirect mediations in which "Active Innovation Resistance" is taking part. Moreover, both mediations have similar impact "Intention to buy", due to the fact that both paths (from "Functional Barriers", and from "Psychological Barriers") to "Intention to Buy" are quite similar, with standardized paths of 0.16 and 0.11 respectively. Therefore, these first additional conclusion highlights the importance of "Active Innovation Resistance", because this construct is present in the "ways" that the model shows to achieve "Intention to buy".

This leads to a second implication; this one is interesting for managerial purposes: lowering the "Active Innovation Resistance" will increase the total "Intention to buy". It is important to lower the mediator construct. This can even lead to further managerial implications, trying to figure out how these innovation resistances might become a positive driver to increase intention to buy.

Obviously, this matter is out of the scope of this thesis, but it might be expanded in future research. In this case, the "active resistance" might be considered as "active driver". Of course, the first step is removing resistance, but once it is achieved, next would be introducing actions to enhance the mediation that leads to "Intention to buy".

The third implication is also managerial, and it is related to the remote antecedents of the Model: functional and psychological barriers. *The most important issue to achieve "intention to buy" is really lowering AIR which cause from both barriers. And it is equally important to reduce the functional barriers and the psychological barriers, because as it has been aforementioned, both paths from these barriers' constructs to "active innovation resistance" are very similar; so, for future research, it can be analyzed how barriers might be transformed into "drivers".*

This is an important finding for managerial purposes. Although it was envisaged and supported in the literature (Wiedmann et al., 2011) and (Shihab & Putri, 2018), its first time that it is proved for our particular setting. The higher the resistance to innovation, the lower the intention to buy. Therefore, it is key for fostering the demand of cars equipped with technological innovation to lower these resistances. Hence, it is suggested providing information to potential customers about these innovations that might lower its resistance, and hence it might rise their intention to

buy. Our recommendation to manufacturers is launching campaigns about the benefits of these innovations, showing how these innovations make easier and safer the driving. Alongside, those informative campaigns might also show how profitable they are, since its extra cost is compensated by large for other savings. All this involves taking some action from the marketing department of the Iranian car manufactures. We also suggest a further step in this direction, implicating the Iranian government taking actions in this role to inform people about the advantages of these innovations.

5.6- Limitations and Further Research

This research like other researches has limitations per se. The primer limitation refers to my selected product. These days, innovative Passenger Vehicles can be used as a proper example of a new innovation which need huge investment that has been explained widely in first chapters of this study and the proposed model of this research for factors influencing innovation resistance in auto industry of Iran is examined and offered under this product category and it is suggested to examine this model in other types of products which are really examples of innovation.

It must, however, be mentioned that there are a series of limitations to the present study that, in turn, represent avenues for future research. The empirical application uses a sample from a particular country; consequently, results cannot be generalized worldwide. A recommendation for further studies relates to cross-country comparisons. Notwithstanding this, we are aware of the difficulties in obtaining homogeneous data.

Since Hybrid cars are good examples of innovative products in most of developing countries so as this model is for automotive industry category, so future researches can concentrate on these products as well.

Regarding Customers Purchasing behavior and the issue of why people show resistance to innovation are very complicated subjects and despite the efforts of this research and the offered model of this study, it cannot be asserted that the proposed model of innovation resistance of this research can fully enlighten all factors of resistance.

The issue of innovation resistance is only studied from a marketing perspective and maybe if engineering researchers bear this research, they will carry this from their

own perspective. Two main factors as a barrier have been considered as hypothetical factors of resistance:

Functional barriers, and Psychological barriers which encompassing 13 factors which can influence on innovation resistance. Obviously, more factors could also be added as this is a wide issue but it is also a matter of some items such as time, expenses and also feasibility; it should be considered that the more variables in the model, or maybe the higher the sample size and greater budget is required. Based on the comparison with the literature and the theoretical adequacy of the research model, suggestions for future research are presented:

1- Implementation of research model in other statistical societies.

1- *Examining this model in another innovative category such as electric vehicles and hybrid cars in auto industry of Iran and adjusting it.*

2- *Predicting the sales volume before producing innovative product*.

3- *Referring to the figure 2.1 Innovation Decision Model (Talke & Heidenreich, 2014), when consumers reject an innovation prior to the persuasion stage, they never even consider its potential (Talke & Heidenreich, 2014). The level of initial resistance likely depends on several drivers, and it is needed to understand these factors to overcome pro-change bias*(T. Laukkanen et al., 2009; Ram & Sheth, 1989), *its highly suggested to work on these drivers in the auto industry.*

4- *The empirical application uses a sample from a particular country; consequently, results cannot be generalized worldwide. A recommendation for further studies relates to cross-country comparisons.*

5- *The most important issue to achieve "intention to buy" is really lowering AIR which cause from both barriers. And it is equally important to reduce the functional barriers and the psychological barriers, because as it has been aforementioned, both paths from these barriers' constructs to "active innovation resistance" are very similar; so for future research, it can be analyzed how barriers might be transformed into "drivers".*

CHAPTER 6- CONCEPTUAL DEFENITION OF CONSTRUCTS

Innovative Vehicle Definition: It should be clarified that Innovative vehicle of SAIPA can be considered as a vehicle with new appearance and new technical features and has been lunched recently in comparison with those non innovative cars which are not launched recently and the appearance is not up-to-date as much as innovative car of SAIPA, but are located at the same segment as innovative car is located.

Innovation: An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behavior is concerned, whether or not an idea is "objectively" new as measured by the lapse of time since its first use or discovery(Rogers, 1983). The perceived newness of the idea for the individual determines his or her reaction to it. If the idea seems new to the individual, it is an innovation (Rogers, 1983).

Active Innovation Resistance: Active innovation resistance is understood as an attitude that follows an unfavorable evaluation of a new product (Talke & Heidenreich, 2014). It is a deliberate form of resistance, which evolves from innovation-specific factors. Consumers shape their attitude toward an innovation on the basis of their evaluation of its attributes (Rogers, 2003a).

New Product Adoption: When a new product, new service or new idea come about, normally a small group of people accept it and after an enough time, any other people adopt these innovations (Rogers, 1976); new products and services can help a firm to achieve a profitable and outstanding market position (Markham & Lee, 2013).

CHAPTER 7- REFRENCES

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CHAPTER 8- APPENDIXES

APPENDIX A: Questionnaire of First Phase (Qualitative)

(Questionnaire for Panel of Experts)

Dear Expert,

The current questionnaire is prepared to receive the opinions of panel of experts for research on "A Model of Crucial Factors Influencing on the Innovation Resistance for Purchasing Innovative Passenger Vehicles in Automotive Industry of Iran"; since your knowledge and your experience in this segment of industry is so valuable, so it is considered to gather your ideas in the following questionnaire.

I would like to inform you that in the previous steps, the researcher has studied and gathered the scientists researches and theories and based on the prior works and by literature review has prepared the current questionnaire .in this step of research by gathering your relevant point of view and your valuable ideas, the conceptual model of this research will be rendered accordingly.

Hereby, I would like to appreciate your kind contribution in this research and I hope by conducting this study we can move forward in detecting crucial factors influencing on customer resistance against innovative products and explore a final practical model in order to remove the relevant obstacles in automotive industry of Iran.

Sincerely Yours

Maryam Shabani

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Table 8.1. First Round of questionnaire of Delphi Model

First Round of Questionnaire of Delphi Model

Item	Factors	Definition	Not at all influential	Slightly Influential	Somewhat Influential	Very Influential	Extremely Influential
1	Complexity	An innovation is too difficult to understand or use					
2	Trialability	difficulties in testing the innovation prior to adoption					
3	Compatibility	An innovation is incompatible with existent and past products					
4	Co-Dependence	Innovation is incomplete and there is need to supplement it with additional parts or service					
5	Visibility	consumers perceive difficulties in observing others using the innovation					
6	Communicability	ineffectiveness when describing the benefits or shortcomings of an innovation to others					
7	Amenability	an innovation seemingly has limited potential to be modified, updated, or tailored to specific consumer needs					
8	Realization	the time span before the benefits of the innovation become manifest is perceived as too long					
9	Perceived Risk	disruption of routine behavior and have higher levels of perceived risk associated with them					
10	Relative Advantage	an innovation may not be in the form of economic gain or in the form of cost savings					
11	Divisibility	an innovation cannot be attempted in stages					
12	Reversibility	An innovation that does not allow the consumer to be able to discontinue adoption of the innovation (at least temporarily),					
13	value	Perceived lack of relative advantage or superior performance by the innovation over existing alternatives					
14	Originality	Consumer does not perceive the innovation as new or as unique as previous offerings					

Item	Factors	Definition	Not at all influential	Slightly Influential	Somewhat Influential	Very Influential	Extremely Influential
15	Personal Risk	Perceiving an innovation as a threat to a consumer's physical condition or property					
16	Social Risk	It prompts disapproval from relevant social groups					
17	Economic Risk	it represents a bad value for money					
18	Functional Risk	fearing that a product could be dysfunctional or mal-functional					
19	Usage	Innovation's inconsistencies with past experiences that threaten to disrupt established usage patterns					
20	Norms	an innovation is perceived as violating group norms, or societal and family values					
21	Information	Perceiving information asymmetries with the conclusion that an innovation has desirable consequences					
22	Image	The innovation's identity (from its origin) like the product category, brand, or the country of origin					
23	Attitude	The amount of resistance that Consumer offers to an innovation, consumer desires to maintain or enhance self-prestige					
24	Personality	Personality traits such as self-confidence and dogmatism play an important role in how consumers react to innovations					
25	Perception	We have already seen how the consumer's perception of the innovation characteristics affects resistance. Unless the consumer perceives the need for the innovation. Consumer is likely to resist it.					
26	Motivation	Consumer is not quite content with the current routine & innovation threatens to disrupt established usage patterns.					
27	Value Orientation	Consumer does not have the superior performance by the innovation					
28	Previous Innovation Experience	Bad Previous experiences that customer has based on innovative products					

Item	Factors	Definition	Not at all influential	Slightly Influential	Somewhat Influential	Very Influential	Extremely Influential
29	Tradition	an innovation requires a customer to deviate from established traditions					
30	Usefulness	The consumer's perception that a product or service does not provide a benefit that fulfills his/her needs					
31	Age	Age of the consumers					
32	Income	Income of consumers					
33	Education	Relevant education of consumer					

Extra factors based on the expert's opinions in the First Round

Item	Factors	Definition	Not at all influential	Slightly Influential	Somewhat Influential	Very Influential	Extremely Influential

Table 8.2. Second Round of questionnaire of Delphi Model

Results of influencing factors based on the expert's opinions in the Second Round

Item	Factors	Not at all influential	Slightly Influential	Somewhat Influential	Very Influential	Extremely Influential
1	Trialability					
2	Co-Dependence					
3	Visibility					
4	Realization					
5	Relative Advantage					
6	Value					
7	After Sales Services					
8	Economic Risk					
9	Functional risk					
10	Usage					
11	Image					
12	Previous Innovation Experience					
13	Usefulness					

APPENDIX B: Questionnaire of Second Phase (Quantitative)

(Questionnaire for Customers)

Which Factors made you to purchase your current vehicle rather than selecting the Vehicle of Brilliance Cross?

Age: 20-30 ☐ 30-40 ☐ 40-50 ☐ 50-60 ☐ 60 or more ☐

Income (£): under 650£ ☐ 650-1200£ ☐ 1200-1600 £ ☐ 1600-2000 £ ☐ 2000 £ or more ☐

Education: under Secondary School ☐ Secondary School ☐ Bachelor ☐ Master ☐ Ph.D. ☐

Table 8.3. Questionaire of Quantitative Phase

No.	Do you purchase innovative car if……	Not at all important	Low Important	Moderately Important	Very Important	Extremely Important
1	It is impossible to test it before purchasing? (Trialability)					
2	It needs additional parts or services? (Co-Dependence)					
3	you see difficulties in using by people who have bought it (Visibility)					
4	The Benefits of it can't be achieved in a short-time? (Realization)					
5	There is no economic gain or cost-saving for you? (Relative Advantage)					
6	It does not have any advantage or superior performance over the existing new cars? (Value)					
7	It represents a challenging after sales services such as no available parts or not affordable? (After Sales Services)					
8	It represents a bad value for money? (Economic Risk)					
9	You fear that it could be dysfunctional or mal-functional? (Functional risk)					
10	There is an inconsistency with your past experiences that disrupt established usage patterns? (Usage)					
11	You have bad image of its country of origin or its Brand? (Image)					
12	You have bad experience based on it? (Previous Innovation Experience)					
13	It does not provide any benefit that fulfills your needs? (Usefulness)					
14	In sum, a possible purchase of it would cause problems that I don't need (Active Innovation Resistance)					
15	I would be making a mistake by purchasing it (Active Innovation Resistance)					
16	In the near future, the purchase would be connected with too many uncertainties (Active Innovation Resistance)					
17	I am considering purchasing this product (Intention to Buy)					
18	I will purchase this product when I need it (Intention to Buy)					
19	I will purchase this product soon (Intention to Buy)					

- **If there is another item that you can add, please add it to the rows No.20 with its importance grade.**