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IMPACT OF PRIVACY-LINKED FACTORS ON INTENTION TO BUY A SMART PERSONAL ASSISTANT

Final Master Thesis

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INTRODUCTION

The topic of virtual assistants has arisen relatively recently, and since 2010 it has been increasingly encountered in the life of a modern person. Smart personal assistants (SPA) such as Amazon Alexa, Google Assistant, Apple Siri, Microsoft Cortana, and Samsung Bixby are smart algorithms that help users perform various tasks (Ha, Chen, Uy & Capistrano, 2020). A large number of people are interested in buying a SPA, which will greatly help them to make their life easier and is accompanied by a number of additional benefits, but on the other hand, people have concerns primarily related to the security of their personal data.

SPA is capable of collecting and analyzing a huge amount of data every minute (Karahoca, Karahoca, & Aksöz, 2018), and some people are concerned about the fact that the data that SPA analyzes and collects may be confidential and personal (Kowatsch & Maass, 2012). In their works, Arias, Wurm, Hoang & Jin, 2015 described how Google Nest or Amazon Alexa track user requests, their preferences and and store this information about users. Oftentimes, this data can be very sensitive, and users have concerns about how companies might use this information (Kowatsch & Maass, 2012).

It has been proven that the collected information can be analyzed on the company's servers for future predictive interaction with the SPA. The companies claim that this is done in order to subsequently offer the user a number of the most likely scenarios for interacting with the device (Ha, Chen, Uy & Capistrano, 2020). Additionally, previous studies have argued that users are aware that SPA is able to track and analyze their data, but most users are unaware that applications can run in the background (Kowatsch & Maass, 2012). Background mode implies that the SPA is capable of capturing the user's keywords and analyzing them. For a more illustrative example, imagine a situation: A user in a conversation mentions that his T-shirt is torn and he needs to order a new one. SPA from Amazon Alexa catches the keywords “Torn”, “T-shirt” & “Order” and then transmits this information to the company's servers, where this information processed. This information can then be used in various scenarios.

SPA is already integrated into most smartphones and is increasingly being implemented in other devices (TVs, speakers, cars, etc.). The SPA market is expected to grow to $ 17.72 billion by 2023 (Ha, Chen, Uy & Capistrano, 2020).

As this area is actively developing in the near future, fears among users will grow and this will have an impact on sales. Therefore, the question may arise about how you can reduce the concerns of users related to the privacy concern and how this will affect the desire to purchase the product. There are a number of factors that correlate with the privacy concern, and an important question will be how the user's final concern will change if one or another factor is changed.

Based on the above, we can conclude that privacy is a huge concern for users, and can influence their decision to make a SPA purchase.

The main objective of the study: to focus on identifying and studying the factors influencing the decision to buy SPA products, and how these factors will vary from individualistic to collectivist cultures.

Objectives:

- Objective 1: Define the concept of intention to buy.
- Objective 2: Identify additional factors which having relationships or impacting theory of planned behaviour.
- Objective 3: Identify factors which having relationships or impacting privacy concern.
- Objective 4: Describe Smart Personal Assistant
- Objective 5: To conduct the research and which would allow to make a conclusion regarding factors influencing the intention to buy Smart Personal Assistants.
- Objective 6: Collect survey data from consumers which would be used for the analysis.
- Objective 7: Analyse the collected data.
- Objective 8: Create a conclusion based on findings.

Structure of the paper:

The structure of this scientific work consists of three main parts. The first part is devoted to literature analysis, it describes TPB theory, intention to buy and analyzes previous studies related with the privacy linked factors. The second part of the study describes the methodology and provides data regarding the sample size, presents the research model, and also describes the hypotheses. In the last part of the study, the results of the study were presented, conclusions were drawn, and limitations were also put forward.

1. THEORETICAL REVIEW OF FACTORS AFFECTING INTENTION TO BUY SMART PERSONAL ASSISTANT

1.1 Intention to Buy

To begin with, it is needed to understand the concept of Intention to Buy, and how does it arise among buyers. Intention to buy is primarily the consumer's intention to enter into a business relationship by conducting business transactions (Pavlou, 2003). Another definition of Intention to Buy is the consumer's desire to purchase a product in the future (Nunes, et al., 2018). It is important to understand that the intention to buy can change under the influence of different factors. For example, price, product quality, or value can have a significant impact on intention to buy (Mirabi, Akbariyeh & Tahmasebifard, 2015). Additionally, in their work, they have argued that consumers tend to shop from companies they know. Brand loyalty can give a competitive advantage, and this is not only about the fact that consumers will choose a product of a certain brand against the competitors, but will be willing to overpay. In this way, brand and brand loyalty is largely capable of attracting consumers to repeat purchases.

An important question will be to understand how Intention to Buy arises. To do this, it is necessary to go back in 1985, when Ajzen presented a theory that is capable of predicting consumer behavior. To begin with, it's worth clarifying that Intention to buy has a very strong correlation with the technology acceptance model (TAM) construction (Hajli, 2015), as well as with the theory of planned behavior (TPB) (Ha & Nguyen, 2019).

The technology acceptance model (TAM) is successfully applied as a theoretical basis for forecasting and predicting intention to buy product online (TAM) Hajli, 2015. TPB, in turn, describes the consumer's intention in terms of “Attitude”, “Subjective Norms ”and“ Perceived Behavioral Control ”. The combination of these factors strongly influences customer intention to buy(Ha & Nguyen, 2019). Many authors focus their attention specifically on TPB, as this construction combines individual, social and behavioral aspects (Vabø & Hansen, 2016). TPB is one of the main theories in predicting behavior. It is worth noting that some authors modify the TPB construct to include additional variables. For example, Yuriev, et al., 2020, described how, for specific studies, the design was modernized and included additional factors such as past behavior, moral norms, identity, and self-esteem. However, it should be noted that the TPB design has a

number of limitations. The TPB construct is capable of learning one desired or harmful behavior at a time. Yuriev, et al, 2020 argued in their work that a construct is able to define one specific behavior, but is not able to account for the complexity of larger issues. The second major limitation of the TBP design is that its data is rarely exported to large populations. This is due to the fact that the developed questions are created in such a way as to solve a specific problem at a time and are targeted to a specific group of people. Additionally, TPB designs have received a lot of criticism, for example, Trafimow, D. (2015) stressed that there have been cases where TPB designs have failed experimental tests. In his own experiment, he found differences in results. They concerned with the distinction between subjective norms and attitudes. But nevertheless, the author argued that there were much more successful experiments. The TPB design has been used in many areas from clinical and screening behavior and gambling to predicting human behavior on the Internet (Raza, et al., 2020).

Another popular construct for modeling and predicting user behavior towards technology is the technology acceptance model (TAM). In the 1980s, there was a fear that workers would reject the IT provided to them, and to meet this challenge, the TAM design was developed in 1986 (Holden & Karsh, 2010). The creator of this model, Fred Davis, argued that the purpose of this design is to predict the acceptability of the tool, as well as to determine the modifications needed to be introduced into the system in order to create a favorable environment for interaction with the device. Interestingly, his research on TAM has been cited 7719 times (Google Scholar, 2020). Holden & Karsh, 2010, argued that the key factor that can lead to increased use of IT is its acceptance. To do this, it is enough to ask the person whether he is going to use IT in the future. The scope of TAM is very wide and can be used in different situations with different variables. For example, Lee, Kozar, & Larsen, 2003, described how TAM was applied to different technologies (GPU, CPU, Email, WWW, GSS), in different temporal and cultural situations with different control factors (gender, age, type and size of the organization), as well as with different human factors (for example, undergraduate students, MBA students, and intellectual workers).

It should be noted that TPB is based on the theory of reasoned action (TRA) and is a modification of it (Emekci, 2019). According to the author, the main difference is the introduction of a new variable perceived behavioral control in the TPB design, which helps to more accurately determine the consumer intent. Emekci, 2019 argued that TPB design is capable of forecasting and predicting consumer behavior. Similarly, TPB constructs, TAM constructs are also based on the theory of

reasoned action (TRA). Its creator adapted TRA and general socio-psychological to understand and predict human behavior in relation to IT (Holden & Karsh, 2010).

Based on the above, it can be concluded that the intention to buy comes from the TPB & TAM theories, which predict and predict human behavior. Additionally, it is worth noting that the TRA theory originally existed, the purpose of which is to predict human behavior. TRA is the basis for such global theories as TPB and TAM. Intention to buy represents the consumer's desire to make a purchase in the future. It is worth noting that there are many different factors affecting intention to buy, but this study will focus on privacy concerns. But logically, it would be more correct to initially describe the product to which it will appear in this study, and further describe the factors associated with privacy concerns.

1.2. Smart personal assistants

The role of innovative products in the modern world can hardly be overestimated. Freeman, & Soete, (1997) wrote that “innovation is central to the economic process,” and for a company, “if you don't innovate, you die.” Akhmetshin, et al., (2018), argued that innovation is a necessity for a company and a critical factor for competitiveness. But still, what is an innovative product and who uses it? According to Bae, Jo, & Lee, (2020), the younger generation is more inclined to use innovative products. The older generation of people was less committed to using innovative products, this was due to the fact that older people had a strong loyalty to old products, and the transition to new innovative products was accompanied by discomfort. However, in his work, Bae, Jo, & Lee, (2020) described how many innovative products were specifically designed for the elderly.

Examples of such innovative products include electric walkers, glare control devices, robots for cleaning floors, and many other inventions. Of course, some products can be used by young people, but statistically, older people are financially better off than the younger generation of people. And for this, many innovations take place in the adult segment.

Before making a purchase, the consumer makes decisions related to the functional and psychological benefits of the product, as well as takes into account the financial side (Huang, et al., 2018). In the context of innovative products, regardless of age, the consumer takes a risk, when buying an innovative product breaks established habits, and also requires efforts on the part of the consumer, to learn new steps, to actively use the product. It should be borne in mind that the consumer may be emotionally attached to an old product, and the transition to an innovative product will be accompanied by additional efforts (Huang, et al., 2018). That is why some companies are afraid to present an innovative product to the masses. Companies are afraid that the consumer will not accept the product and the company will suffer big losses. There have already been such cases in history. For example, in 2015, Google stopped selling its “Google Glass” smart glasses to ordinary users, the product was relatively crude and had relatively poor functionality. Investors believed that this innovative product would not bring much profit, and therefore sales to ordinary users stopped in 2015 (Google company, 2021). However, as stated earlier, in order to survive and be competitive, you need to be innovative, and on May 18, 2016, Google unveiled its Smart Personal Assistants to the public.

An interesting fact, in the context of innovative products, creativity can give a strong impetus to the development or invention of something new. According to Strohmann et al. (2018), creativity can not only give a company an innovative product but, also save important resources such as time and money. This can be achieved in different ways, but in particular, it is achieved by inventing a new innovative approach to solving the problem or creating an innovative product which will solve a problem. Creativity can be used and applied to many products, including Smart Personal Assistants.

After a discussion of innovative products, it is necessary to focus on a specific and very interesting category which is called "smart personal assistants." Interaction between a computer and a person has long been through physical interactions on a device (keyboard and mouse) (Edu, Such, & Suarez-Tangil, 2019). However, recently this trend has changed a lot, and people have become aware of the integration of new ways of human interaction with the device. The voice has become a new round of evolution in this context. In his work, Edu, Such, & Suarez-Tangil, 2019 described the simplicity of interaction between a person and a device with the help of a voice, for this, a person only needs to say a phrase and the device will execute it, thanks to a pre-planned scenario. Scenarios are divided into two main types, simple (find out the time, weather), and complex (include jazz music from the 80s, order a Pepperoni pizza home) scenarios (White, 2018). This technology of voice control is increasingly being introduced into the life of a modern person and is already actively used in the context of Smart Personal Assistants (SPA). SPA is becoming more and more common in homes. According to Knote, et al., (2019) from 2015 to 2021, SPA sales grew 4.6 times, which brings about 2.3 billion USD average sales growth per year. The main representatives of SPA are Amazon Alexa, Google Assistant, Apple Siri, Microsoft Cortana, and Samsung Bixby. SPA is based on a complex architecture that includes cloud processing, as well as integration with other smart devices (White, 2018). This architecture provides the ability to inject skills from third-party developers. It is worth noting that there are 2 types of skills. Type 1, these are fundamental and basic skills that are initially integrated into SPA by initial developers (Amazon, Google, etc.), and Type 2, these are all skills that are introduced by third-party developers (Edu, Such, & Suarez-Tangil, 2019). In his work, White, 2018, he described that the number of skills in each of the above SPA is growing at a rapid pace every year, and as an example, he cited Amazon Alexa, which had 26,000 available skills as of December 2017. And as of 2020, Amazon Alexa has over 100,000 skills available.

Thus, it can be concluded that SPA is a representative of an innovative product. It is a complex virtual system capable of performing many tasks of varying degrees of complexity. Thanks to technological advances, people's lives are becoming easier, and such innovative products bring many benefits. However, there is a downside. Consumers have to pay. And it's not just about money, consumers have to pay with their data, and often that data can be personal. This is why, consumers have a privacy concern and because of this, consumers refrain from purchasing SPA.

Additionally, it should be borne in mind that additional factors can influence the consumer's desire. For example, ease of use can be an important factor in which theoretically can affect customer intention to buy SPA. When it comes to the ease of use of a SPA, we are talking about the initial setup of the assistant, the synchronization of the SPA with smart gadgets in the house, as well as its personalization. If the process is complex and time-consuming, there is a high probability that users will choose another alternative that will meet their requirements.

It should be borne in mind that SPA is an innovative product that is linked by many factors that are closely correlated with TPB elements. The perceived ease of use example is one of many factors to consider. On the other hand, this product (SPA) is highly dependent on privacy. As previously stated, users are concerned about their personal data and that they can lose it. Thus, it is necessary to deepen and analyze the factors that can influence the main components of TPB, as well as factors that are associated with privacy concerns.

1.3. Factors affecting key variables of TPB

1.3.1 Perceived enjoyment

The perceived enjoyment effect is increasingly seen in research related to computer technology. According to Dickinger et al., 2008, the original TAM model has been extended to include the perceived enjoyment construct. This is due to the arrival of innovative products, the Internet, in particular websites. Teo & Noyes, 2011 have argued that within TAM, perceived enjoyment is highly correlated with intrinsic motivation, which is a strong motivator for performing an action. Perceived enjoyment is believed to be positively associated with the desire to use something in particular Praveena & Thomas, 2014. In their article, it was proven that perceived enjoyment has a strong correlation with user behavior.

Teo & Noyes, 2011 described utility and enjoyment as critical factors in the context of behavioral intent, and that ease of use affects perceived enjoyment. Thus, it can be concluded that in a SPA context, the simpler the interaction, the higher the perceived enjoyment. Following this logic, Teo & Noyes, 2011 have argued that perceived enjoyment is highly correlated with the desire to use the product. This conclusion can be found in other works as well. For example, Dickinger et al., 2008, argued that a favorable process of interaction with a product has a positive effect on the desire to continue using that very product. In conclusion, it can be argued that perceived enjoyment is an important factor that can have a strong influence on the attitude towards a product, in this case, SPA. The enjoyment of interaction, as well as simplicity, can give a beneficial effect and increase the desire to use the product.

1.3.2 Perceived usefulness

Dickinger et al., 2008, described perceived utility as being defined as the degree to which an individual believes that using a particular system will improve their performance. Gerasimova et al., 2018 have argued that perceived ease of use is “the degree, in which a person believes that the use of the system will be free of physical and mental effort". Another definition of perceived usefulness was given by Suki & Suki (2011). They described Perceived usefulness as the prospective likelihood that the use of a particular degree will help and improve the performance of a particular user. Their article argued that Perceived usefulness is an important factor that can significantly influence user behavior and attitudes. An interesting conclusion was reached by Teo & Noyes, 2011, who noted that the perceived ease of use of a product, in this particular case of a SPA, would have a

strong impact on perceived utility. However, the author clearly explained that only such a scenario is possible, and the structure will not work in the opposite direction.

1.3.3 Perceived Ease of use

Perceived Ease of use can be described as the degree to which “the person believes that using the system does not require mental effort” Hansen, Saridakis & Benson 2018. In Chen & Aklikokou 2020, argued that factors such as Perceived Ease of use and perceived usefulness are extremely important factors that can predict human behavior in relation to innovative technologies. In addition, in their work, they clarified that the above two factors, namely Perceived Ease of use and perceived usefulness are critical to the design of TAM. Perceived Ease of use can also be characterized as the degree to which the user perceives a particular technology (SPA) to be easy to use Moslehpour et al., 2018. Their work argued that ordinary users will tend to choose the product that is easier to use and provides the most value. In short, Perceived Ease of use & perceived usefulness is powerful attributes for decision making and future intent to use a product.

To gain a better understanding of how perceived ease of use can indirectly influence a user's decision about whether to buy a SPA or how perceived ease of use can influence a customer to buy a SPA of a particular brand.

Imagine the following situation: Before purchasing a SPA, the user decides to do research and see how easy and intuitive the interaction between the user and the SPA will be. Interaction such as the first set-up, connecting to WiFI, creating an account, and synchronizing smart objects in the house can become a weighty attribute, and how easy and understandable they will be can affect whether the user will buy SPA or not.

Additionally, when it comes to privacy, it is important to consider how easily a user can find information regarding privacy and how to manage private data. Most spas work constantly and listen to the user's speech, but become active for interaction is only when the user utters a special phrase, such as "Hey Siri" or "Alexa". The user's speech and what he is talking about is confidential, and some users will want to completely disconnect the microphone from the assistant and control SPA using a smartphone (for example, turn on the lights in the living room), in such a scenario, it is important for developers to configure the SPA in such a way that all his teams were user friendly.

It is worth noting that Hansen, Saridakis & Benson 2018 mentioned that there is a strong correlation in the TAM construction between factors such as perceived behavioral control and perceived ease of use. In their work, they argued that if the Perceived Ease of use is high, but the perceived control is low, then the user will have low intent to use the product.

1.3.4 Self-Efficacy

Self-efficacy is defined as the degree to which a user is confident in their ability to complete a specific task (Pal, et all., 2019). Bandura, A. 1986 defined Self-efficacy as:

> ‘‘ People’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performance. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses ”.

Additionally, Pal, et all., 2019 argued that self-efficacy positively influences the adoption and use of an innovative product. In other words, a person with higher self-efficacy will feel more confident with an innovative product; for this study, SPA acts as an innovative product. Leeraphong, Papasratorn & Chongsuphajaisiddhi, 2015 in their work argued that the more experience a person has, the higher his self-efficacy. They raised the issue that a user with more experience in using various innovative products will be more worried about the control of personal information. In other words, users will carefully control the flow of their personal data to maximize the benefits of using SPA without putting sensitive information at risk. A trivial example of this is linking a non-main bank card to a SPA for shopping on the Internet. This way, the user can continue to enjoy all the benefits of the smart assistant (like ordering goods directly home buy using his voice), while not jeopardizing the really important data.

1.3.5 Propensity to trust

The tendency to trust reflects a person's inner state and is an intrinsic factor that reflects a person's tendency to believe or not to believe others Lu, Zhao & Wang, 2010. In their research study, they argued that the propensity to trust has a strong correlation with trust. It should be borne in mind that the inclination to trust very much depends on the cultural background of the person. Users with different cultural backgrounds, backgrounds, and personality types are able to demonstrate varying

degrees of trust (Cheung & Lee, 2006). Research shows that a user who is in a trusting community will later also begin to show a high trusting inclination.

In the context of product innovation, it can be assumed that users with a higher propensity to trust are more likely to trust an innovative product such as SPA. For companies that develop and sell SPA, such users look more attractive than others, since it is easier for such users to instill in the SPA that they are completely safe.

Summing up the above, we can conclude that the propensity to trust is an important factor that has a direct impact on user behavior. In the context of an innovative product such as SPA, the addiction to trust can have a profound effect on a user's attitude, thereby blurring their fears and prompting them to take action. Of course, the cultural background of the user can have a profound effect on the propensity to trust.

1.4 Factors affecting privacy concern

1.4.1 Privacy concern

The next step is to discuss what might influence a person's desire to buy a SPA and how perceived privacy might affect this. Perhaps, for a start, it is necessary to understand the term perceived privacy and why this factor is so important in the context of innovative products. Ha et al., 2020 stated that for an innovative product as an SPA, the information associated with the user is largely helps to personalize the virtual assistant. However, information accumulated by SPA over a long period of time can pose a threat to the user. A study by Ha et al., 2020, described that even the daily and routine actions of a user, which are recorded and analyzed, can pose a serious threat to user privacy. Lau, Zimmerman & Schaub, (2018), described that SPA can be more useful and provide additional benefits to those users who provide their personal data. An example is Amazon's SPA Alexa, which will be able to remind the user of a planned business meeting, or that a restaurant reservation has been canceled. However, in his work, the author noted that this approach is accompanied by a great risk for the personal user information. Interestingly, there are many users who do not have a broad understanding of the importance of such issue, and voluntarily provide personal information in exchange for short-term benefits (Ha et al., 2020). It is important to take into account that, the more information a user provides, the more personalized and useful SPA becomes, at the same time this is accompanied by an ever greater privacy concern. The question is, what is the privacy concern and how it affects a consumer?

Privacy concern is related with confidentiality of information. Confidentiality of information primarily describes a person's ability to control the methods of collecting his information, which will subsequently be analyzed and used in the future (Fortes & Rita, 2016). Consumers are very concerned about the fact that online businesses have a huge data flow that can include personal and private data (Gurung & Raja, 2016). In their work, they argued that privacy concerns can vary from consumer age, gender, education, as well as country of residence. A study by Midha, 2012 states that 64% of people decided not to buy a product from an unknown company, because they were not aware of how their personal data would be used. Additionally, 30-40% of online users provide false information on the Internet Midha, 2012.

Another definition of privacy concerns is the definition of Baruh, Secinti & Cemalcilar, 2017, which described privacy concerns in terms of persuading people associated with risks and bad consequences in the process of sharing or providing personal information. As you can see, privacy

concerns is a very important aspect, which in one way or another affects the behavior of the buyer. That is why the EU, in cooperation with the Federal Trade Commission (FTC), has paid great attention to this aspect. Their collaboration resulted in the creation of guidelines for collecting user information. According to Fortes & Rita, 2016, the principles include rules for the collection of information by sellers, correction of errors in the information collected, notifying consumers about the use of their information for purposes other than the original. The implementation of these principles should give people confidence that their personal data will remain safe. It is worth noting that Chellappa & Sin, 2005 argued that collecting data is a necessary process in an online environment, thanks to which people will be able to receive more personalized content. In their work, they argued that without providing personal information, the supplier would not be able to tailor and personalize the offer for the client.

However, in the context of the SPA, an issue of concern was raised primarily related to data privacy. In their work, Zeng, Mare, & Roesner, 2017, described the risks associated with the leakage of confidential data due to an error in the protocols. The consequences of such an error can be very dire for the owner of the SPA which is linked to the house, because the data associated with the house, devices located in the house, as well as the user's personal information, can be stolen. Zeng, Mare, & Roesner, 2017, cited several examples of massive attacks as proof, ranging from the Mirai bot DDoS attack that disrupted the functioning of the Internet for more than a million users, to the hacking of a smart TV with a built-in microphone and wiretapping. However, it is worth noting that engineers, in opposition to all these attacks, are developing more and more complex and secure systems that will protect user data. Apple introduced the Apple T1 security cheap in 2016, which was used to encrypt sensitive data. And already in 2018, it released version 2 of this Apple T2 Security Chip. Apple itself did not describe the architecture of the chip, this is done primarily in order to avoid hacking it (Apple company, 2020).

To summarize, it can be concluded that privacy is a very important topic in the context of the modern world, and the issue of privacy strongly affects the average user. Online companies and in particular companies that develop SPA should pay great attention to this issue.

The privacy issue can have a strong impact on the desire to purchase a product. This is especially true in the context of SPA, which constantly collect, analyze and store user information. As mentioned earlier, a wide range of information helps a SPA to become more personalized and useful, however this comes with risks associated primarily with the privacy concern. But it should be borne in mind that the “Confidentiality problem” is a dependent variable and it can change under

the influence of other variables. This research will focus on how the combination of several factors can influence the buyer and his desire to purchase a product. The following are factors that are independent and will influence the "Confidentiality problem". It is worth considering that the factors will be divided into two categories “Company Related Factors” and “Customer Related Factors”.

1.4.2 Perceived Risk

Consumers perceive risk because their transactions expose them to unpredictable circumstances and unforeseen consequences Ozturk et al., 2017 In the context of innovative products, Perceived Risk was identified as a possible negative customer experience when interacting with a product Another definition of Perceived Risk can be a person's judgment about possible harm or damage as a result of a particular situation or set of circumstances that may affect the decision-making process Ho, et al., 2017. In addition, it has been shown that the higher the customer's Perceived Risk, the less likely the customer will make a purchase. In the context of SPA, Perceived Risk is an extremely important factor that can affect more than just the intention to make a purchase. purchase, but also on the desire to use the product. As mentioned earlier, there is a danger of personal data leakage, wiretapping as well as taking control of smart household appliances. These are the factors that can greatly affect the buyer. An example would be a person's previous departure. the person has had a negative online shopping experience, they will have a negative attitude towards online shopping and will visit a physical store as an alternative.

It is worth noting that Ho, et al., 2017, have argued in their work that cultural context and experience can shape or influence the perception of risk. Additionally, perceived risk is greatly increased if the consumer interacts with a new technology, such as SPA Ozturk et al., 2017. According to their research, if a technology does not deliver on its promises, it negatively affects the behavioral intentions of customers to use the new technology.

In summary, it can be concluded that perceived risk is an extremely important factor that can significantly affect privacy concerns and thus have an impact on how to purchase and use an innovative product.

1.4.3 Privacy Awareness

As mentioned earlier, modern technology is an integral part of our life, and it is already difficult to imagine a person whom technology would bypass. However, the development of modern technologies is impossible without the active participation of users.

The study of this area has been especially popular in the past decade. According to Soumelidou, & Tsohou, (2019), research on privacy awareness is gaining increasing interest among researchers. Their work argued that there is no single and universal definition of privacy awareness. However, Malandrino, et al., 2013 summarized several important issues to create a common understanding of privacy awareness:

- Who tracks and collects the user's personal information
- When a user's personal information is tracked and collected
- What personal information is shared with third parties
- How and how much of the information is processed to create a user detail profile.

Of course, the information collected by the company serves to improve the user experience. However, as noted by Malandrino, et al, 2013, technologies and related with them policies are evolving much faster than the privacy awareness of users. An important question: how does privacy awareness arise? Human awareness implies attention, perception, as well as knowledge of the physical and non-physical properties of an object (Stefanie Pötzsch, 2009). In the context of privacy awareness, this can be associated with the awareness of users about possible threats, as well as leakage or disclosure of their personal data (Soumelidou, & Tsohou, 2019). Additionally, a study by Soumelidou, & Tsohou, 2019 argued that many researchers define privacy awareness based on its importance. What does it mean? For example, in the context of certain products, user awareness is critical and necessary, while in the context of other products, privacy awareness can be neglected. However, privacy awareness is an important advantage for users, thanks to which users can be aware of specific and more specific situations and how they should behave. In this study, it will be proposed to compare and analyze the privacy awareness of consumers from different cultural backgrounds, and to identify what similarities or differences are inherent in users of different cultures.

Summing up, it can be concluded that privacy awareness is an important advantage of users, which can ensure their protection. A knowledgeable user will be more confident and accurate on the

Internet, since the user will know who and how collects his personal data. No wonder, Acquisti, A., & Gross, R. (2006) said that privacy awareness is "the ability of a person to control who can see their profile."

1.4.4 Trust in the Product Category

Consumer confidence in a particular product category is an important factor in making a purchase decision (Hobbs & Goddard, 2015). There are many definitions of trust. For example, Creed et al., 1996, in their work mentioned 16 different interpretations of trust. So what trust is it? To begin with, it should be argued that trust is critical to building long-term relationships. Trust can arise between two parties if the following qualities are observed: credibility, competence, integrity, honesty, reliability, benevolence, and rational thinking (Michler, Decker & Stummer, 2020). Modern literature claims that trust can emerge when "both parties are confident in the correctness and reliability of each other's actions" (Chiung-Ju Liang & Hui-Ju Chen 2009).

Trust in products has been a subject of debate and has been extensively studied in recent times. For example, recent research related to product innovation has focused on product design, implementation, and architecture (Michler, Decker & Stummer, 2020). In their research, they argued that each of the above factors play an important role in the context of trust in innovative products. Product design can emotionally alienate or attract a user. The implementation (internal to the product) must maintain a high level of privacy, encryption, and network security measures. And the product architecture (which is the inner part of the product) must be scalable and extensible (Michler, Decker & Stummer, 2020.

It should be noted that trust can be divided into two types. Patrick, et al., 2007, proposed to classify and divide the trust into potential and repeat customer trust. In the case of potential customer trust, is talking about consumer behavior at the time of initial interaction with the product. An example would be a customer's interaction with a product in a store. Repeat customer trust, in turn, describes the trust in the product with which he had a favorable experience of interaction.

Going back to trust in an innovative product category, Michler, Decker & Stummer, 2020 created a model of factors that can build consumer confidence. In their research, they argued that factors such as: Control, product performance, product handling, a brand of a product, onboarding and information, security and protection & transparency can greatly enhance user confidence in a product category.

Another possible way to increase trust in a certain product category is special approval seals or certificates of approval (Kimery & McCord, 2002).

Just like when people visit a website they see a seal of approval, users feel more trusted to the site, the same happens when people see a seal or certificate of approval on a product. There are many different organizations that test a product or an entire category of products and assign a rating, through which users can form their opinion about the product. Certified products or product categories will look better against competitors and will instill greater consumer confidence.
It is also worth considering the fact that trust in a product has a very strong correlation with consumer loyalty (Laakkonen, M. (2017). It has been repeatedly proven that loyal consumers stay with a company or a product for a long period of time, and are also able to ignore offers Loyal customers also have a lot of trusts, be it an organization or a specific product category. In the context of Smart Personal Assistants, positive loyalty can have a big positive impact on customer confidence.

In summary, it can be concluded that trust is a very important factor that has a number of benefits. The category of goods that inspires confidence among consumers will look more advantageous against the background of competitors and will be able to attract a large consumer audience. An innovative product is capable of causing mistrust among users at first, but as mentioned earlier, there are special organizations that test the product and then issue (or not) a certificate, which can later positively affect consumer confidence in the innovative category.

1.4.5 Willingness to Disclose Data

SPA is an innovative product and as mentioned earlier, it needs your data to function better and more accurately. In his work, Robinson, 2017, argues that the need or desire to disclose information may outweigh any perceived risk associated with the disclosure of personal information. In the context of a SPA, an example would be providing information about the residential address or providing information about a bank card so that the SPA can order products to the users at home. Such information is very sensitive and the user must balance the benefits of disclosure with the possible risk. Additionally, the author cited the privacy paradox as an example in his article. Privacy paradox according to Kokolakis, 2017, more the exact name informational privacy paradox is nothing more than privacy and privacy behavior. In other words, it is the behavior of a person who claims to be concerned about their privacy but continues to use tools that collect their personal data.

The author argues that such a paradox can arise when users are not knowledgeable enough or are illiterate about how data is collected. According to Robinson, 2017, a combination of factors can influence the user's decision to provide personal data. When it comes to providing personal information, users try to minimize the amount of data provided, but at the same time increase the reward. It is worth noting that some cultures are less sensitive to their data and will be more inclined to provide it in exchange for a benefit. In a SPA context, the reward may be more personalized content or better and more accurate assistant performance. Thus, users have a choice whether to provide their personal data and have a more enjoyable and risky user experience, or not.

In the conclusion of all of the above, it can be noted that the problem of confidentiality is one of the main problems of our time. Modern man lives in a world where technology is ingrained in his life and is an integral part. The main problem is that modern technologies are constantly collecting data, and at times, this data can be personal in nature. This is the main concern of users. Companies claim that this information, which the company collects, helps to improve algorithms, predict user preferences, thereby providing additional benefits. But not all users are willing to pay such a high price. Previously listed factors that in theory can be correlated with privacy concerns. A more accurate conclusion will require some research to get accurate results.

2 METHODOLOGY OF THE EMPIRICAL RESEARCH ON THE FACTORS WHICH AFFECTING INTENTION TO BUY SMART PERSONAL ASSISTANT

2.1 The purpose of the empirical research

The Internet of things is became an internal part of the modern world. In particular, SPA has been introduced and rooted in the lives of many people, and every year the percentage of such people is growing. As stated earlier, interaction with a SPA involves a trade-off between a more intuitive and personalized interaction with a SPA and user privacy. The influence of the privacy concern on the desire to purchase a product has already been studied, however, an innovative product such as SPA is different from conventional products, and more research is needed in this area.

The main purpose of this study is to identify and analyze fundamental factors that can influence TPB, privacy concern & willingness to disclose data, as well as their compilation impact on intention to buy SPA. By studying the correlations of factors and obtaining reliable and new information in this area, this study aims to provide companies with data that can indicate the main problem or strengths associated with their innovative product - SPA.

2.2 Research model and hypotheses

The model below demonstrates the chain of the most important factors that can most accurately influence a person's decision about whether to use SPA. The developed research model consists of 7 dependent and 7 independent factors. It is necessary to take into account the fact that some presented factors such as “Attitude”, “Subjective norms”, “Perceived control”, “Privacy concern” & “Willingness to disclose data” can directly affect “Intention to Buy Smart Personal Assistants”, while other factors presented require medians.

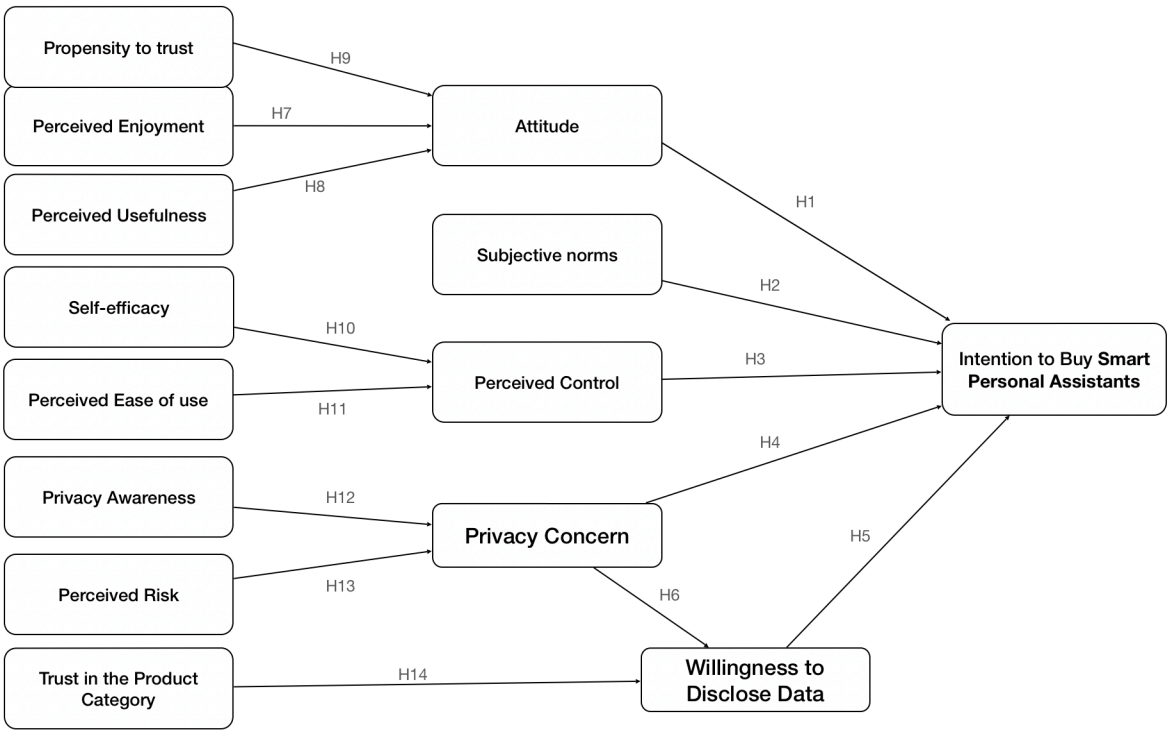

Figure 2. Research model, developed by the author

As stated earlier, there is a huge amount of work that is devoted to the study of the relationship between SPA & human. The presented model is a modification of the Yang & Lee, 2019 and Ha & Nguyen, 2019 models. This model was based on the TPB model and this model has undergone modifications. A number of factors have been added to it that are directly related to SPA. For example, factors such as

To measure the interaction of the factors presented in the table above, 14 hypotheses were developed and presented. It is necessary to find out which factors or combination of factors can have the greatest impact on the user and his intention. This must be done in order to understand exactly what companies need to pay attention to when developing and promoting their voice assistants. This model presents a number of factors that are most frequently encountered in scientific papers on the interaction between humans and SPA.

As mentioned earlier, this model is based on the TPB model, where the final factor is “Intention to Buy Smart personal Assistant”, in turn, this factor depends on additional factors such as Attitude, Subjective norms & perceived control. These factors figured in the original TPB model and it has already been shown that there is a strong correlation between the above factors and “Intention to

Buy" (Liao, Chen & Yen, 2007). However, since the SPA is an innovative product, it is necessary to go through the repetitions of the study in order to prove the connection.

Thus:

H1 There is a positive relationship between attitude and intention to buy smart personal assistant.

H2 There is a positive relationship between subjective norms and intention to buy smart personal assistant.

H3 There is a positive relationship between perceived control and intention to buy smart personal assistant.

This TPB model has been modified, and for a more accurate understanding of the processes affecting the intention of consumers to buy SPA, 2 additional factors have been added, such as privacy concern & willingness to disclose data. Privacy Concern is perhaps one of the most important factors that can have a strong impact on Intention to Buy Smart Personal Assistants. As stated earlier, during the use of the SPA, various user data accumulates, which in the future can be

used to more intuitively perform tasks (Ha et al., 2020). This information can serve as a repulsive factor if the user wants to purchase a SPA. Additionally, many users may refuse to purchase due to the fact that for a more accurate SPA operation, the user will be obliged to share and disclose their personal data. In such a scenario, there is a correlation between privacy concern & willingness to disclose data.

Thus:

H4 There is a positive relationship between privacy concern and intention to buy smart personal assistant.

H5 There is a positive relationship between willingness to disclose data and intention to buy smart personal assistant.

H6 There is a positive relationship between privacy concern and willingness to disclose data.

All of the above factors are heavily impacted by other factors. A factor such as Perceived Enjoyment can have a fundamental impact on the user's attitude towards the SPA. Teo & Noyes, 2011, argued that Perceived Enjoyment is very similar to the user's intrinsic motivation. In other words, if the user receives an enjoyment while using it, then he subconsciously will crave to continue interacting with the product. Additionally, Teo & Noyes, 2011 found that there is a strong correlation between factors such as Perceived Enjoyment & Perceived Ease of use. However, it is

more important to focus on whether there is a correlation between factors such as Perceived Enjoyment & Attitude in the context of an innovative SPA product. Additionally, Perceived Usefulness is defined as the subjective likelihood that the use of particular system hardware or product, in this case, SPA, will increase the user's productivity (Praveena, & Thomas, 2014). Earlier in the paper, it was described that Perceived Usefulness is an extremely important factor that can significantly affect user behavior and attitudes. In the SPA context, trust can have a profound effect on attitude, which in the future can influence the customer's intention to buy SPA. Propensity to trust, as stated earlier, describes the consumer in terms of how much he or she believes others. Cheung & To, 2017 argued that trust and propensity to trust have a very strong correlation. In their work, they studied the relationship between trust and attitude. If the user's environment claims that an innovative product such as SPA is safe and capable of providing many benefits to the user, then depending on the user's level of trust, it will be easier / harder for the user to accept the product.

Thus:

H7 There is a positive relationship between perceived enjoyment and attitude.

H8 There is a positive relationship between perceived usefulness and attitude.

H9 There is a positive relationship between propensity to trust and attitude.

In turn, a factor such as perceived control can be correlated with factors such as self-efficacy & perceived ease of use. A factor such as Self-efficacy is an important element that can have a strong impact on the user. A highly self-efficacious user is more confident and experienced (Leeraphong, Papasratorn & Chongsuphajaisiddhi, 2015). Modern literature suggests that there is a relationship between factors such as Self-efficacy and perceived control. Litt, 1988 argued that people with great self-efficacy prefer to be in control when given the opportunity. Scaling this idea to SPA suggests that highly self-efficacious users will have more control over their interactions with the SPA. Perceived ease of use describes user experience with a product as the degree to which the user is relieved of mental effort when using the product, in this particular case, SPA. In this study, perceived ease of use will describe how easy it should be for a user to interact with a personal assistant. Praveena, & Thomas, 2014, described the importance of perceived ease of use in explaining the acceptance of different systems. It should be noted that most studies have looked at perceived ease of use from the perspective of interaction with attitude (Praveena, & Thomas, 2014), but for this study, it is decided to examine if there is a correlation between perceived ease and perceived control.

Thus:

H10 There is a positive relationship between self-efficacy to trust and perceived control.

H11 There is a positive relationship between perceived ease of use and perceived control.

Privacy Concern, which was added to this model, likewise depends on factors such as privacy awareness & perceived risk. Privacy awareness is a fundamental factor that can greatly reduce user concerns. As stated earlier, due to too rapidly growing technological progress, the user does not have time to learn all the innovations associated with the privacy policy (Malandrino, et al, 2013). Additionally, it has previously been described that for some product categories, user privacy awareness is critical and necessary, while for other product categories it can be neglected. Thus, it is necessary to check whether the relationship between such factors as privacy awareness & privacy concern exists in the context of such an innovative product as SPA. In turn, factors such as the perceived risk & privacy concern can also be correlated. This is due to the fact that if the consumer wants to make a purchase, for this study the target product will be SPA, the consumer may have doubts or uncertainty. This may be due to fear for their personal data, which, as previously stated, SPA uses to more accurately execute commands.

Thus:

H12 There is a positive relationship between privacy awareness & privacy concern.

H13 There is a positive relationship between perceived risk & privacy concern.

For this study, it will also be necessary to check the correlation of factors such as trust in the product category & willingness to disclose data. As far as SPA is concerned, it is a relatively young product that is constantly being modernized, you need to make sure that users who trust the product are ready to provide their personal data.

Thus:

H14 There is a positive relationship between trust in the product category and willingness to disclose data.

2.3 Research design, instrument and scales, sampling method

Research design

An empirical research design is an experiment that is planned to be conducted among consumers who have the intention to buy a smart personal assistant. As stated earlier, the purpose of this experiment is to identify factors that can influence consumer behavior. The focus of this study is the smart personal assistant, which belongs to the category of innovative products. As the number of

users increases every year, it is necessary to identify the critical factors, the impact of which will most strongly affect consumers.

This research is based on Qualitative research, which is an online questionnaire. Data collection will take place from September 10 to October 10 inclusive. Since this study plans to reveal how people with different geographic affiliations behave differently, it is important to clarify that the respondents will be divided into 2 groups: users with a Lithuanian geographic origin, and users with a Russian geographic origin. This study will be divided into two parts. The first part will contain questions related to the behavior of buyers directly. The second part of the study will focus on collecting the demographic data of the respondent.

Since this study focuses on the study and identification of factors that are theoretically capable of influencing consumer behavior, it was decided to exclude any mention of the brand. This decision is accompanied by the following explanation, the respondent may have pleasant associations with the brand, which can have a strong influence on their answer. This scenario can have a significant impact on the entire study as a whole.

Research instrument and scales

For this research, a survey in the form of a questionnaire is used as a research tool, which includes various types of questions. And the survey included screening questions, questions related directly to the relationship between users and SPA, as well as demographic questions.

At the beginning of the survey, a screening question was used (question no. 1). Second, we used multiple-choice questions that focus on the relationship between the user and the SPA. (2-14). In this study, to measure the relationship between factors, it was decided to use the 7 points Likert scale, where 1 means “Strongly disagrees” and 7 means “Strongly agree”. Finally, this questionnaire includes several demographic questions (questions 15, 16, 17, and 18) that described gender, age, the income of respondents, education, and status of relationships. The respondents in this study must demonstrate their attitude to various factors, the combination of which can influence the final decision of the respondent regarding his desire to make a purchase.

A three-point construct characterizing attitude was adapted from (Wu & Chen, 2005). The three-item scales associated with subjective norms were adapted from (Wu & Chen, 2005). Perceived control uses three-item scales that were taken from (Klobas, McGill, & Wang, 2019). A four-item

scale describing privacy concern was adapted from (Cheah, et all., 2020). Three-item scales related to willingness to disclose data will be adapted from (Kim, et all., 2019). Intention to buy uses a three-point scale taken from (Lee, Trail, Lee, & Schoenstedt, 2013). Perceived enjoyment uses a three-item scale taken from (Singh, et all., 2021). Two elements of the perceived risk scale were adapted from (Wang, McGill & Klobas, 2018). Perceived usefulness uses a four-item scale that was taken and adapted from (Kim, et all., 2019). The four-item scales associated with perceived ease of use were adapted from (Lewis, 2019). A three-point construct characterizing privacy awareness was adapted from (Aleisa, Renaud & Bongiovanni, 2020). The three-item scale for self-efficacy was taken from (Kiili, Kauppinen, Coiro, & Utriainen, (2016). The three-item construct describing propensity to trust was adapted from (Frazier, Johnson, & Fainshmidt, 2013). The four-point construct describing trust in the product category was adapted from Kiili, et all., 2016.

Sampling

This part of the study describes the methods, as well as the required number of respondents. Since this study focuses on "intention to buy SPA", it was decided to choose the category of people over 18 years old. This choice is due to the fact that consumers who have reached this age, are aware and are able to think more rationally. As for the required size of respondents, where the population exceeds 50,000 people, the formula of Dikčius, 2005 was used to calculate it.

Where:

N - required sample size

z - standard error associated with the selected level of confidence

p - estimated share of the population

e - valid sampling error

$$N = \frac{z^2 p(1-p)}{e^2}$$

It should be borne in mind that the confidence level for this study will be 95%. Additionally, for this case, z is 1.96 and an acceptable sample error of 5.51% was chosen. Thus, the required number of respondents for this study will be 317 people.

Data collection and preparation

An online questionnaire was developed for this study. English was chosen as the language of communication with the respondents. The study presents fourteen factors to which the respondent had to give a clear answer. After collecting the data, it is planned to use the SPSS program to identify the relationships between the factors.

3 EMPIRICAL ANALYSIS OF PRIVACY LINKED FACTORS ON INTENTION TO BUY SMART PERSONAL ASSISTANT

3.1. Sample and measures

Before moving to the calculations it was decided to present the information about the respondents. The total amount of respondents was 324, however, 7 of the respondents were removed from the final calculations, due to their inability to complete the survey. The survey was held online and the requirements for participants was the ability to understand and answer the questions on English language and be older than 21. The age of 21 is conditioned by the people who achieved this age making purchases more rationally. For a broader picture and more accurate analysis, additional demographic questions were used in the study. All respondents were asked to provide their demographic data. In Table 1, it can be clearly variable that in a 64 percent case, of all respondents are male(203 respondents), and in the rest, 36 percent cases are female(114 respondents).

Table 1. Sample structure based on the gender.

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	203	64	64	64
Female	114	36	36	100
Total	317	100	100	

The next demographic aspect was related to the age of respondents. Based on the data obtained during the research which are illustrated in the Table 2, it can be concluded, that the vast majority of respondents are older than 26 years and contains 54%. The rest of the respondents are aged between 21 and 25 years contains 46%.

Table 2. Sample structure based on the age.

Age	Frequency	Percent	Valid Percent	Cumulative Percent
21-25	146	46.0	46.0	46.0
26 and older	171	54.0	54.0	100
Total	317	100	100	

Another demographic question was addressed to respondents regarding their income. Based on the research results, it can be concluded that 32.5 percent have incomes in the range of 1001€ - 1500€ and this group of respondents is the biggest one. More information regarding the respondent's income can be visible in the Table 3.

Table 3. Sample structure based on the income

Income	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1000€	74	23.3	23.3	23.3
€1001-€1500	103	32.5	32.5	55.8
€1501-€2000	65	20.5	20.5	76.3
€2001-€3000	58	18.3	18.3	96.6
More than 3001€	17	5.4	5.4	100
Total	317	100	100	

Summarising all presented above information, it is clearly visible, that majority of respondents are male. Most of the respondents are older than 26 years and respondents who have a salary range between 1001€-1500€ are met most frequently.

Reliability tests of scales

Before analyzing the data, the reliability tests were performed with each construct to ensure that data meets standards. To do this procedure the statistical software SPSS was used. From the best practices, it is recommended for Cronbach's alpha (α) to be more than 0.6. In this research, the scale trust in the product category has the lowest Cronbach's alpha (α) which is 0.671, oppositely, the highest Cronbach's alpha (α) which is 0.984 belongs to the intention to buy a scale. All results of this procedure are presented in the Table 4, which is placed below.

Table 4 Cronbach's alpha for research scales.

Scale	Enitial amount of variables	Final amount of variables	Cronbach's alpha
Trust	4	4	0.981
Perceived Enjoyment	4	4	0.974
Perceived Usefulness	4	4	0.884

Perceived Ease of Use	4	4	0.952
Self Efficacy	3	3	0.930
Privacy Concern	4	4	0.983
Privacy Awareness	3	3	0.950
Trust in the Product Categoty	3	2	0.671
Perceived Risk	2	2	0.938
Attitude	3	3	0.975
Subjective Norms	3	3	0.983
Perceived Control	3	3	0.915
Intention to Buy	3	3	0.984
Willingness to disclose personal data	8	8	0.911

Additionally, it should be mentioned, that it was decided to remove one item (*I would trust companies not to use data produced by Smart Personal Assistant for any purpose without my explicit consent*) from trust in the product category scale, which allowed to increase reliability from 0.597 up to 0.671. This action was made only once, all the rest scales stayed untouched.

3.2. Tests of hypotheses

In order to measure the relationships and differences between dependent and independent variables, which was presented earlier in the research model, and confirm or reject a hypotheses, multiple regression was used. For a better understanding of the presented information regarding the hypotheses, it was decided to explain the structure of how the information will be presented. Hypotheses themselves will be presented on the top, in the middle information and results of the calculations will be presented and lastly, the model will be presented on the bottom.

HYPOTHESES:

H1 There is a positive relationship between attitude and intention to buy smart personal assistant.

H2 There is a positive relationship between subjective norms and intention to buy smart personal assistant.

H3 There is a positive relationship between perceived control and intention to buy smart personal assistant.

H4 There is a positive relationship between privacy concern and intention to buy smart personal assistant.

H5 There is a positive relationship between willingness to disclose data and intention to buy smart personal assistant.

In the beginning, it was decided to test hypotheses related to the intention to buy smart personal assistant. For checking whether there is a relationships between variables (attitude, subjective norms, perceived control, privacy concerns, and willingness to disclose data) that may affect intention to buy smart personal assistant, multiple regression analysis was used. Before reviewing the results of the Coefficients, the significance of the overall model was checked. Calculations showed that $p < 0.001$, and $F = 469.056$. Additionally, it can be concluded that of these variables explain 88.3% (R square = 0.883) of the intention to buy a smart personal assistant which is the dependent variable. After making sure that the results are significant, the outcome of a coefficient model can be taken into account. The results of multiple regression are presented in the Table 5, which demonstrates, that 1 out of 5 hypotheses was rejected. Variables like attitude (β= ,0174, p =,002 t=3,163), subjective norms (β= ,0648, p =,001 t=13,423), perceived control (β= ,062, p =,005 t=2,829), privacy concern (β= ,174, p =,001 t=6,592) shows a positive impact on intention to buy smart personal assistants. Whereas, variables like willingness to disclose data (β= -,030, p =,294 t=-1,050), didn't show any significant impact on intention to buy smart personal assistant. But it must've been said that willingness to disclose data may not have enough significance to impact the intention to buy smart personal assistant, due to its very strong correlation with the attitude (the calculations are presented in the appendix). Therefore, bases on findings, it can be stated, that hypotheses 1-4 are confirmed, and hypothesis 5 is rejected.

Table 5. Results on relationships of different variables towards intention to buy smart personal assistant.

Hypotheses	Variables	Standarised coefficients B	Standarised coefficients Std. Error	Standarised coefficients Betta	t	Sig.	Confirmed/ Rejected
H1	Attitude	.207	.065	.174	3.163	.002	Confirmed
H2	Subjective Norms	.650	.048	.648	13.423	.001	Confirmed
H3	Perceived Control	.095	.034	.062	2.829	.005	Confirmed

Hypotheses	Variables	Standarised coefficients B	Standarised coefficients Std. Error	Standarised coefficients Betta	t	Sig.	Confirmed/ Rejected
H4	Privacy Concerns	.185	.028	.174	6.592	.001	Confirmed
H5	Willingness to disclose data	-.037	.036	-.030	-1.050	.294	Rejected

The next calculations were aimed to check whether there is an impact from privacy concerns on willingness to disclose data.

H6 There is a positive relationship between privacy concern and willingness to disclose data.

Linear regression was used to check if there is a relationship between privacy concerns and willingness to disclose data. The data showed that the model is significant, since $p<0.001$ and $F= 71.200$. Additionally this variable is explain 18.4% (R square = 0.184) of willingness to disclose data which is the dependent variable. Based on the results of the analysis which are presented in the Table 6, it can be stated that there is an impact of privacy concern to a willingness to disclose data, since ($\beta= ,429$, $p =,001$ $t=8,438$). Therefore, a hypothesis is confirmed. Additionally, it to test whether privacy concerns are acting as a variable which is impacting intention to buy smart personal assistant through the willingness to disclose data, additional calculations were made. These calculations are presented on the Table 11, which is placed right after the hypothesis 14.

Table 6. Results on relationships of privacy concern and willingness to disclose data.

Hypothesis	Variables	Standarised coefficients B	Standarised coefficients Std. Error	Standarised coefficients	t	Sig.	Confirmed/ Rejected
H6	Privacy Concerns	.365	.043	.429	8.438	.001	Confirmed

Next step will be related to the analysis of attitude and its antecedents.

H7 There is a positive relationship between perceived enjoyment and attitude.

H8 There is a positive relationship between perceived usefulness and attitude.

H9 There is a positive relationship between propensity to trust and attitude.

In order to test the relationship between attitude and variables which may affect it(perceived enjoyment, perceived usefulness, and propensity to trust), multiple regression was implemented.

The data showed that the model is significant, since p<0.001 and F= 162.052. Additionally, this variable is explain 60.8% (R square = 0.608) of attitude which is a dependent variable. Therefore, the results of these calculations were presented in the Tabe 7, and it can be stated that 2 out of 3 hypotheses were confirmed. Perceived usefulness has a positive impact on attitude (β= ,479, p =,001 t=6,300), the propensity to trust has a positive impact on attitude (β= ,459, p =,001 t=8,933). Oppositely, perceived enjoyment has no significant impact on attitude (β= -,055, p =,535 t=-,621). Therefore, bases on findings, it can be stated, that hypotheses 8-9 are confirmed, and hypothesis 7 is rejected.

Table 7. Results on relationships of different variables towards attitude.

Hypotheses	Variables	Standarised coefficients B	Standarised coefficients Std. Error	Standarised coefficients	t	Sig.	Confirmed/ Rejected
H7	Perceived Enjoyment	-.058	.094	-.055	-.621	.535	Rejected
H8	Perceived Usefulness	.572	.091	.479	6.300	.001	Confirmed
H9	Propensity to Trust	.368	.041	.459	8.933	.001	Confirmed

This calculations is dedicated to the perceived control and variables which may impact it.

H10 There is a positive relationship between self-efficacy to trust and perceived control.

H11 There is a positive relationship between perceived ease of use and perceived control.

To test whether there is a relationship between variables like self-efficacy and perceived ease of use to perceived control, multiple regression was used. The data showed that the model is significant, since p<0.001 and F= 142.708. Additionally, this variable is explain 47.6% (R square = 0.476) of perceived control which is dependent variable. Results of this results can be visible on Table 8. Based on findings, it can be stated, that there is a strong impact of self-efficacy to trust and perceived control (β= ,349, p =,001 t=6,767) and there is a strong impact of between perceived ease of use to perceived control (β= ,420, p =,001 t=8,139). Therefore hypothesis 10 and 11 are confirmed.

Table 8. Results on relationships of different variables towards perceived control.

Hypotheses	Variables	Standarised coefficients B	Standarised coefficients Std. Error	Standarised coefficients	t	Sig.	Confirmed/ Rejected
H10	Self-Efficacy	.302	.045	.349	6.767	.001	Confirmed
H11	Perceived Ease of Use	.376	.046	.420	8.139	.001	Confirmed

Next step will be analyzing privacy concern and set of variables which may impact it.

H12 There is a positive relationship between privacy awareness & privacy concern.

H13 There is a positive relationship between perceived risk & privacy concern.

In order to test the relationship between privacy awareness and privacy concerns & perceived risk & privacy concern, multiple regression was used. The data showed that the model is significant, since $p<0.001$ and $F= 406.047$. Additionally this variable is explain 72.1% (R square = 0.721) of privacy concern which is dependent variable. Based on the results, which are presented in the Table 9, it can be stated, that privacy awareness (β= ,411, p =,001 t=9,211), and perceived risk (β= ,498, p =,001 t=11,172) are both has strong impact to privacy concern. Therefore, it can be concluded, that hypothesis 12 & 13 are confirmed.

Table 9. Results on relationships of different variables towards privacy concerns.

Hypotheses	Variables	Standarised coefficients B	Standarised coefficients Std. Error	Standarised coefficients	t	Sig.	Confirmed/ Rejected
H12	Privacy Awareness	.443	.048	.411	9.211	.001	Confirmed
H13	Perceived Risk	.534	.048	.498	11.172	.001	Confirmed

The last calculations was aimed to test the impact between variables like rust in the product category and willingness to disclose data.

H14 There is a positive relationship between trust in the product category and willingness to disclose data.

Linear regression was used to check if there is a relationship between privacy concerns and willingness to disclose data. The calculations showed that the model is significant, since $p<0.001$ and $F= 302.062$. Additionally, this variable is explain 49.0% (R square = 0.490) of privacy concern

which is the dependent variable. Based on results, which are presented in the Table 10, it can be stated, that there is a strong relationship between trust in the product category (β= ,700, p =,001 t=17,401) and willingness to disclose data. Thus, hypothesis 14 is confirmed.

Table 10. Results on relationships of between trust in the product category and willingness to disclose data.

Hypothesis	Variables	Standarised coefficients B	Standarised coefficients Std. Error	Standarised coefficients	t	Sig.	Confirmed/ Rejected
H14	Trust in the Product Category	.875	.050	.700	17,401	.001	Confirmed

Additional calculations

Additionally, it was decided to test, whether privacy concerns affect intention to buy smart personal assistant via willingness to disclose data. In order to check it, PROCESS_v4.0 was used. According to the results, which are presented on Table 11, it can be stated, that there is an relationships between privacy concerns and willingness to disclose data (β= ,3635, p =,001 t=8,4380). Additionally, willingness to disclose data (mediating variable) has an impact to intention to buy smart personal assistant (dependent variable), since (β= ,3047, p =,001 t=5,8618). Based on Bootstrap rule, it can be stated, that privacy concerns has indirect impact on intention to buy smart personal assistant via willingness to disclose data, sins (BootLLCI=,0718, BootULCI=,1559).

Table 11. Results on how privacy concerns affect intention to buy smart personal assistant via willingness to disclose data.

	Variables	Coefficients	t	Sig.
Privacy concerns	Willingness to disclose data	,3635	8,4380	.001
Intention to buy smart personal assistant	Willingness to disclose data	,3047	5,8618	.001
			BootLLCI	**BootULCI**
Inderect effect of X on Y			,0718	,1559

On top of the previous calculations regarding on how different variables are impacting intention to buy smart personal assistant, it was decided to test, how the intention is depending on the reggpondents gender. In order to test the differences, the multiple regression was made. For the first analysis, it was decided to stick with the male audience. Calculations showed that $p < 0.001$, and $F = 325.305$. Additionally, it can be concluded that of these variables explain 89.2% (R square = 0.892) of the intention to buy smart personal assistant which is dependent variable. From this results, can be concluded, that willingness to disclose data is not enough significant to impact intention to buy smart personal assistant, since $p = 0.362$. Other variables are are significant enough to have a strong impact on the dependent variable which is intention to buy smart personal assistant. The results of this calculations are presented in the Table 12.

Table 12. Results on relationships of different variables towards intention to buy smart personal assistant, depending on respondents gender (Male).

Variables	Standarised coefficients B	Standarised coefficients Std. Error	Standarised coefficients Betta	t	Sig.
Attitude	.236	.077	.201	3.053	.003
Subjective Norms	.594	.058	.592	10.149	.001
Perceived Control	.124	.045	.071	2.732	.007
Privacy Concerns	.225	.033	.218	6.837	.001
Willingness to disclose data	-.038	.041	-.031	-.914	.362

Second group of respondents which are female showed completely different results. The same procedure was made as with the male group. Firstly, is is required to check the significance of the multiple regression model. Calculations showed that $p < 0.001$, and $F = 149.904$. Additionally, it can be concluded that of these variables explain 87.4% (R square = 0.874). Based on the results which are obtained during research, it cab be concluded, that only subjective norms has an impact to the dependent variable which is intention to buy smart personal assistant. Other variables didn't have a significant impact. More details can be visible on the Table 13.

Table 13. Results on relationships of different variables towards intention to buy smart personal assistant, depending on respondents gender (Female).

Variables	Standarised coefficients B	Standarised coefficients Std. Error	Standarised coefficients Betta	t	Sig.
Attitude	.156	.122	.128	1.283	.202
Subjective Norms	.754	.086	.751	8.763	.001
Perceived Control	.073	.056	.053	1.313	.192
Privacy Concerns	.095	.052	.084	1.817	.072
Willingness to disclose data	-.041	.070	-.030	-.579	.564

3.3. Discussion and additional findings

The main goal of this research was to determine the main factors which may or may not affect customers intention to buy smart personal assistant. Following the empirical research, it was discovered that 2 out of 14 hypotheses were rejected. Figure 3 represents which hypotheses were confirmed and which were rejected.

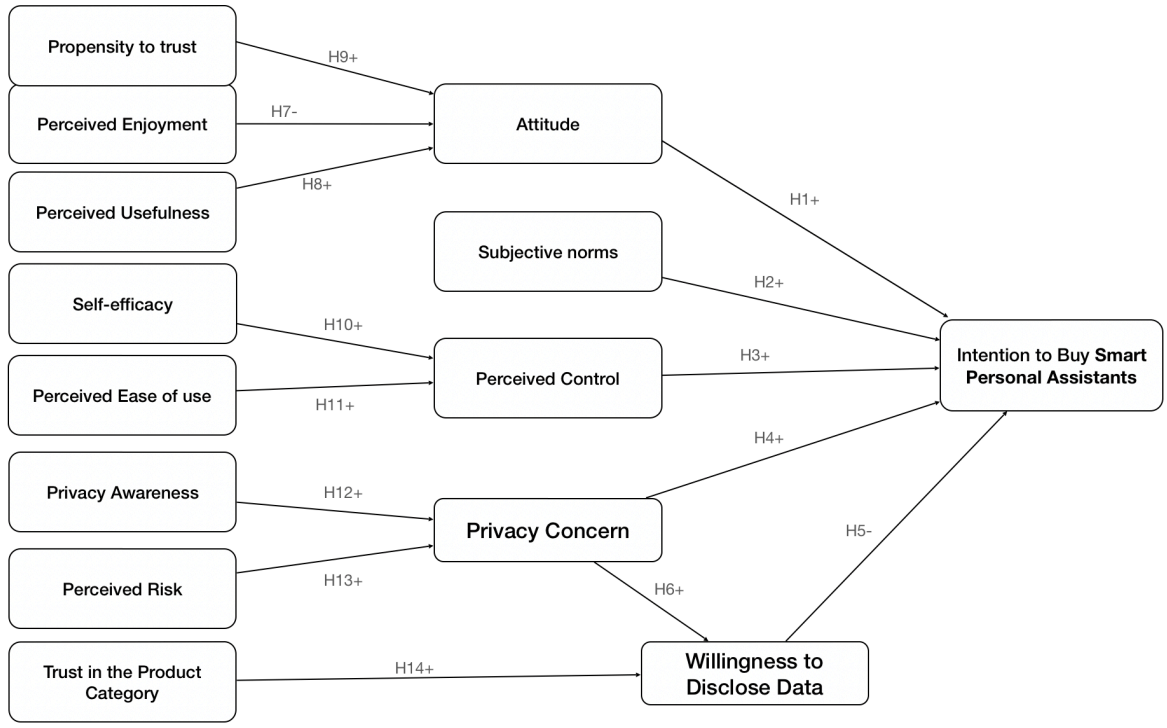

Figure 3. Confirmed or rejected hypotheses based on the model.

Results of the study showed that variables which are presented in a TPB are impacting intention to buy smart personal assistant. This conclusion is similar to what Liao, Chen & Yen, 2007 proved in their research. However, in this research, on top of well known TPB variables like attitude,

subjective norms and perceived control (H1-H3), additional factors like privacy concerns (H4) and willingness to disclose data (H5) were added. Based on the results which are presented above, it was found, that variable like privacy concerns are impacting intention to buy smart personal assistant. Exclusion was variable like willingness to disclose data, which is not impacting intention to buy smart personal assistant. However, is must be underlined, that there is a correlation between willingness to disclose data and intention to buy smart personal assistant. Factor such as privacy concerns has a strong impact in willingness to disclose data (H6), therefore proofs the earlier presented hypothesis.

Additionally, it was decided to test, wether the impact of privacy concern on intention to buy smart personal assistant is mediated by attitudinal loyalty willingness to disclose data. The results of the calculations showed, that there is week inderect and strong direct impact in intention to buy smart personal assistant. So we it can be concluded that privacy concern is a very important factor which may impact intention to buy smart personal assistant not only directly, but also through the willingness to disclose data. Next set of hypotheses were related to attitude and factors which may impact attitude. The calculations showed, that two out of three factors, like propensity to trust (H9) and perceived usefulness (H8) are impacting attitude, and only one factor like perceived enjoyment (H7) is not impacting attitude. The findings related with perceived usefulness is resonate with what Praveena, & Thomas, 2014 described in their work. Additionally, the calculations showed, that impact on property to trust on attitude is similar to Cheung & To, 2017 findings. Due to this, it can be concluded, that majority of respondents are not considering smart personal assistant as an object for getting enjoyment. Opositly, research showed that factor such as perceived usefulness has strong impact on attitude. So for respondents the texcnical side of smart personal assistant like perceived usefulness is considered to be more valuable. Due to this, it can be suggested for developers of SPA put more attention of how they can make SPA more useful. Speaking about next set of hypotheses which are related to perceived control, it can be stated that both self-efficacy (H10) and perceived ease of use (H11) variables are impacting perceived control, meaning that both hypothess are confirmed. The results indicate, that perceived ease of use has a stronger impact on perceived control and variable like self-efficacy has slightly lower impact. Leeraphong, Papasratorn & Chongsuphajaisiddhi, 2015 stated, that person whith the high self efficacy tends to have more control over the things. In other words, self-efficacy impacting perceived control. As was stated earlier in, perceived ease of use in some research words thends to impact attitude (Praveena, & Thomas, 2014), but for this research it was decided to test whether perceived ease of use can impact perceived control. Moving forward to hypotheses H12 and H13, where the main goal was to proof

that there is an impact of variables like privacy awareness and perceived risk to perceived control. Outcome of calculations showed, that there is a strong impact of both variables on perceived control. Due to this, both hypotheses (H12 & H13) are confirmed. The results on this was aligned with Malandrino, et al, 2013 who stated that there is an relationships between privacy awareness and perceived control. Very last hypothesis was related to the impact of trust in the product category on willingness to disclose data. Calculations showed, that there is a strong impact of trust in the product category on willingness to disclose data (H14), proving earlier presented hypothesis.

During the research it was additional found out, that intention to buy smart personal assistant is heavily depending on the respondents gender. Male, showed similar results as the findings of H1-H5 hypotheses, meaning only willingness to disclose data in not significant enough to impact intention to by smart personal assistant. However females results are appeared to be completely different. Based of research results, it can be concluded that only subjective norms has enough significance to impact intention to by smart personal assistant.

CONCLUSIONS AND RECOMMENDATIONS

Smart personal assistant can become an indispensable attribute in the life of a modern person, thanks to which a person can significantly facilitate his daily routine. The owner of the Smart personal assistant will be able to order any goods, find out the news or manage his home using his voice. However, as mentioned earlier, it is at this stage privacy concerns issues may arise. This study was aimed at exploring what variables can impact the intention to buy a Smart personal assistant.

1. After analyzing of the previous researches, it can be stated, that intention to buy smart personal assistant is driven by the same factors which are presented in the TPB model, which includes attitude, subjective norms and perceived control.
2. Many scholars mention, that variables like privacy concerns may have an impact to intention to buy. This is the reason why this variable was included as one of the antecedents of intention to buy smart personal assistant, which is constantly collecting and analyzing data. Besides of privacy concerns, willingness to disclose data was added as a variable which in theory may impact ntention to buy smart personal assistant.
3. In this research, additional groups of variables were added, which can have an impact on variables which are presented in the TPB model (attitude and perceived control), as well as privacy concerns and willingness to disclose data. In the case of attitude, the group of variables like propensity to trust, perceived enjoyment, and perceived usefulness was added. Variables like self-efficacy and perceived ease of use were linked to perceived control, due to these variables allowed to a person to have more control over the device. Privacy awareness and perceived risk are linked to privacy concerns, because many scientific works mentioned their connections. And lastly, variable like trust in the product category was linked to willingness to disclose data.
4. Smart personal assistant is a physical device the main purpose of which is to help owners of smart personal assistant to perform a set of different tasks and this in theory should make their lives easier. But on the other side for correct and more intuitive performance, smart personal assistant needs a lot of data, which in some cases might be very personal.
5. As was stated earlier, data is being collected and analysed and that might be very dangerous, because big Tex companies, which are basically coding the algorithms and creating smart personal assistants, can segregate customers buy different demographic characters, preferences and social status. And knowing this information company’s can predict behavior and manipulate clients.

6. After analyzing the data, can be concluded that all the variables which are presented on original TPB model like attitude, subjective norms and perceived control are impacting intention to buy smart personal assistant. Because of smart personal assistant can be considered as an innovative product, two additional variables like privacy concerns and willingness to disclose data were added. Results showed that only privacy concerns has an impact on intention to buy smart personal assistant. In the survey, respondents showed their concerns regarding how their personal information will be tracked and analyses. That being said, it can be suggested for companies and developers focuse their attention on how they collecting importation about their customers. Oppositely, research showed, that willingness to disclose data do not impact intention to buy smart personal assistant. This discovery is quite contradictory, because respondents showed their concerns regarding privacy, but not regarding willingness to disclose.
7. Attitude is a one of main variables which can have strong impact on intention to buy smart personal assistant. Regression showed, that in this research there are two elements like property to trust and perceived usefulness which are impacting attitude, and only one variable like perceived enjoyment which is not impacting attitude.
8. Perceived control is one of the key variables which is presented in TBP. Research showed, that and there are two variables which has a strong impact to Perceived control. Self-efficacy and perceived ease of use has a strong impact on perceived control. As was stated earlier, perceived ease of use may have a significant impact on customer, sines smart personal assistant is a device which should in theory make the life easier and this is why smart personal must be an easy to interact with. Self efficacy indicates how customers is capable to execute specific task. As was stated earlier, that person who has a high self efficacy is more willing to try an innovative products such as smart personal assistant.
9. Privacy Concerns as was stated earlier has a strong impact on intention to by smart personal assistant, but also there are two variables like privacy awareness and perceived risk which are impacting privacy concerns. Privacy awareness, is the tool which can help reduce privacy concerns. Customer who is aware about how smart personal assistant is tracking their activity, which information is being collected will be less concerned. Perceived risk is a factor which is can arise after a negative experience. In the context of smart personal assistant, perceived risk is extremely important, since perceived risk can impact privacy concerns and privacy concerns can impact intention to buy smart personal assistant.
10. Willingness to disclose data is the only one variable which is not impacting intention to buy smart personal assistant, but it must been said, that variable like trust in the product category is

impacting willingness to disclose data. So it can be stated, the amount of personal data which person will disclose will depend on which product customer is using.

11. On top of the previous calculations if was decided to test the impact of variable which are presented in the TPB model as well as privacy concerns and willingness to disclose data on intention to buy smart personal assistant which is dependent variable, based on the respondents gender. Calculations showed, identical in terms on the impact variables on intention to buy smart personal assistant results while only male are included. Oppositely, when data from females were included in the calculations, the variable like subjective norms was significant enough to have an impact on dependent variable which is intention to buy smart personal assistant.

Recommendations based on presented above conclusions.

1. Calculations showed, that for female audience, variable like subjective norms is significant enough to impact the intention to buy smart personal assistant, and the recommendations for the producers and sellers of smart personal assistant would be to focus only on subjective norms as a variable, because calculations showed, other variables are not significant. In case of male audience, calculations showed that all variables except willingness to disclose data are impacting intention to buy. So recommendations for salespeople and company which produces devices would be to stress more attention to variables which are presented in the TPB model as well as privacy concerns.
2. Next recommendations will be addressed for future researchers. As was stated earlier, data collection is extremely important factor in the life of a modern person, and big companies, with extream audience has a petabytes of sensitive information. Recommendation would be to analyze how to government can prevent big companies to collect sensitive and personal data.
3. Additionally, for companies and developers would be recommended to decrease the amount of data which is being collected, because this is healthy can impact the customer and his/her privacy concerns.

The main goal of this study was to find out factors which are impacting intention to buy smart personal assistant. Results of the study indicates, that majority of previously presented hypotheses were confirmed, meaning that privacy linked factors are indeed impacting intention to buy smart personal assistant. Thus, it can be concluded that factors which are presented in the model are

interlinked, therefore, impacting one variable in the beginning of the model could impact the last dependent variable which is intention to buy smart personal assistant.

Limitations of the research

This study has some limitations. First of all, one should take into account the fact that the sample of the study is not representative: in other words, the data were not random. The questionnaire was published on the Facebook and Telrgram groups, spread via friends, and between coworkers and wasn't linked to the email, that means that person could pass the test twice. Additionally, survey didn't include questions, whether respondent privacy bought smart personal assistant.

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SUMMARY

Rodion Grinko

IMPACT OF PRIVACY-LINKED FACTORS ON INTENTION TO BUY A SMART PERSONAL ASSISTANT

Master Thesis

Academic supervisor: prof.dr. Sigitas Urbonavičius

Vilnius University

Specialization: Marketing and Integrated Communication

Vilnius, 2022

Size: 44 pages, 2 models, 13 tables.

Innovative products like smart personal assistants have huge growth potential. Over the past decade, people have witnessed how this technology is increasingly being introduced into their lives. Of course, for greater personalization and better and more intuitive performance, smart personal assistant collects and processes a huge amount of data, which sometimes might be very personal. The main goal of this study was to analyze the interaction of various factors, the combination of which may impact customers' intention to buy smart personal assistants. During the research, the model was created and as the foundation, the TPB model was used. Additionally, 2 more variables were added, which may impact the intention to buy smart personal assistants. The study showed that there is a strong relationship between intention to buy a smart personal assistant and its antecedents, however, one of the variables didn't have enough significance to impact the dependent variable which is the intention to buy a smart personal assistant. Additionally, the research provides calculations, on how antecedents of intention to buy smart personal assistants may be impacted by other variables. On top of it, this work demonstrates, how the intention to buy smart personal assistants, may depend on the respondent's gender. This research finds answers to important questions related to privacy, which variables are impacting intention to buy smart personal assistants, and how the personal data may be used. The results and findings of this study may be used for a company's which are developing smart personal assistants, to help them to deliver the

best possible experience using the safest way. The questionnaire was published on the Facebook & Telegram groups, was spread between coworkers, therefore anyone could take part there. Nevertheless, this master thesis has strong theoretical and practical value, and developers and salespeople can adapt and use the data of this scientific work to increase customer's intention to buy smart personal assistants.

SANTRAUKA

Rodionas Grinko

SU PRIVATUMU SUSIJUSIŲ VEIKSNIŲ POVEIKIS KETINIMUI ĮSIGYTI IŠMANŲ ASMENINĮ PADĖJĖJĄ

Baigiamasis magistro darbas

Vadovas: prof.dr. Sigitas Urbonavičius

Vilniaus universitetas

Specializacija: Rinkodara ir integruota komunikacija

Vilnius, 2022 m

Dydis: 44 puslapiai, 2 maketai, 13 lentelių.

Novatoriški produktai, tokie kaip išmanieji asmeniniai asistentai, turi didžiulį augimo potencialą. Per pastarąjį dešimtmetį žmonės matė, kaip ši technologija vis dažniau pristatoma į jų gyvenimą. Žinoma, siekiant didesnio personalizavimo ir geresnio bei intuityvesnio veikimo, išmanusis asmeninis asistentas renka ir apdoroja didžiulį duomenų kiekį, kuris kartais gali būti labai asmeniškas. Pagrindinis šio tyrimo tikslas buvo išanalizuoti įvairių veiksnių sąveiką, kurių derinys gali turėti įtakos klientų ketinimams įsigyti išmaniuosius asmeninius asistentus. Tyrimo metu buvo sukurtas modelis ir kaip pagrindas panaudotas TPB modelis. Be to, buvo pridėti dar 2 kintamieji, kurie gali turėti įtakos ketinimui pirkti išmaniuosius asmeninius asistentus. Tyrimas parodė, kad yra stiprus ryšys tarp ketinimo įsigyti išmanųjį asmeninį asistentą ir jo pirmtakų, tačiau vienas iš kintamųjų neturėjo pakankamai reikšmės, kad paveiktų priklausomą kintamąjį, ty ketinimą įsigyti išmanųjį asmeninį asistentą. Be to, tyrime pateikiami skaičiavimai, kaip ketinimų įsigyti išmaniuosius asmeninius asistentus gali turėti įtakos kiti kintamieji. Be to, šis darbas parodo, kaip ketinimas pirkti išmaniuosius asmeninius asistentus gali priklausyti nuo respondento lyties. Verta paminėti, kad šis tyrimas turi keletą apribojimų. Šis tyrimas randa atsakymus į svarbius klausimus, susijusius su privatumu, kokie kintamieji turi įtakos ketinimui įsigyti išmaniuosius asmeninius asistentus ir kaip gali būti naudojami asmens duomenys. Šio tyrimo rezultatai ir išvados gali būti

panaudoti įmonėms, kurios kuria išmaniuosius asmeninius asistentus, kad padėtų joms saugiausiu būdu suteikti geriausią įmanomą patirtį. Anketa buvo paskelbta Facebook ir Telegram grupėse, buvo platinama tarp bendradarbių, todėl joje galėjo dalyvauti visi norintys. Nepaisant to, šis magistro darbas turi stiprią teorinę ir praktinę vertę, o kūrėjai ir pardavėjai gali pritaikyti ir panaudoti šio mokslinio darbo duomenis, kad padidintų kliento ketinimą pirkti išmaniuosius asmeninius asistentus.

APPENDIXES

Appendix 1. Questionnaires

Student from Vilnius University currently is performing a study, which is aimed at finding out factors that drive customers to buy Smart Personal Assistant. Please answer the questions by ticking the correct options. The information provided by you will be anonymous, only generalized data will be used.
This form usually takes up to 7-8 minutes.
Thank you in advance for the answers.

1) 1. Would you feel confident answering questions of the survey in English?
Yes
No

There is a software agent that can perform different tasks for an individual based on commands (usually voice commands) or questions, and in this research, this agent is called Smart Personal Assistant. For example, you can think about Amazon's Alexa, Apple's Siri or some other option.

First of all, let us know something about you. Please evaluate the following statements from 1 to 7 where 1 is "totally disagree" and 7 is "totally agree".

2) 2. Trust (Propensity to trust):
• I usually trust people until they give me a reason not to trust them.
• Trusting in another person is not difficult for me
• My typical approach is to trust new acquaintances until they prove I should not trust them
• My tendency to trust others is high

Now imagine, that you own one of Smart Personal Assistants. Please let us know, how your experience with it would be. Please provide us information how much you are agree with below presented statements from 1 to 7, where 1 is " totally disagree" and 7 is "totally agree".

3. Perceived Enjoyment:
• Using a Smart Personal Assistant is fun.
• Using a Smart Personal Assistant is enjoyable.
• Using a Smart Personal Assistant is pleasurable.
• Using a Smart Personal Assistant is very interesting.

4. Perceived Usefulness:
• Using this Smart Personal Assistant service helps me get useful information.
• Using a Smart Personal Assistant would improve my performance.
• Using a Smart Personal Assistant would enhances my effectiveness.

• Using a Smart Personal Assistant would enable me to accomplish my task more quickly.

5. Perceived Ease of use:

• Learning to operate Smart Personal Assistant would be easy for me
• I would find it easy to get Smart Personal Assistant to do what I want to do
• My interaction with Smart Personal Assistant would be clear and understandable
• I would find Smart Personal Assistant easy to use

6. Self efficacy:

• I feel confident that I can use Smart Personal Assistant effectively
• I feel confident that I can learn how to use Smart Personal Assistant independently
• I feel confident that when I use Smart Personal Assistant, I can solve technical problems if I face them.

One of main principles for Smart Personal Assistants to work is being able to access your personal data. Let us know how important are the following statements by responding to them from 1 to 7, where 1 is " totally disagree" and 7 is "totally agree"

7. Privacy Concern:

• It bothers me that the Smart Personal Assistant is able to track information about me.
• I am concerned that the Smart Personal Assistant gets too much information about me.
• It bothers me that the Smart Personal Assistant is able to access information about me.
• I am concerned that my information could be used in a ways I could not foresee.

8. Privacy Awareness:

• I am aware of privacy issues and practices in our society
• I follow the news and developments about privacy issues and privacy violations
• I keep myself updated about privacy issues and the solutions that companies and government employ to ensure our privacy.

What are your expectations towards Smart Personal Assistant? Let us know how important are the following statements by responding to them from 1 to 7, where 1 is "totally disagree" and 7 is "totally agree".

9. Trust (Trust in the product category):

• I (would) fully trust Smart Personal Assistant not to fail, and to function as I expect

• Knowing that Smart Personal Assistant allows companies or organisations to collect data about how I use them, and hence about my domestic habits, would restrict me from owning/using them
• I would trust companies not to use data produced by Smart Personal Assistant for any purpose without my explicit consent

10. Perceived Risk:

- I expect that using smart home devices would present me with problems that I just don't need
- The benefits of using smart home devices are unlikely to compensate for the cost, time and effort of using them.

Please let us know how much do you are agree with below presented statements related with buying Smart Personal Assistant from 1 to 7, where 1 is " totally disagree" and 7 is "totally agree"

11. Attitude:

• Buying and using Smart Personal Assistant would be a good idea.
• I like the idea of buying and using Smart Personal Assistant.
• Buying and using Smart Personal Assistant would be pleasant.

12. Subjective norms:

• Most people, important to me, think that I should buy Smart Personal Assistant.
• Most people, important to me, would want me to purchase Smart Personal Assistant.
• People whose opinion I value prefer me to buy Smart Personal Assistant.

13. Perceived Control:

• If I want to, I could buy Smart Personal Assistant
• I think it is easy for me to buy Smart Personal Assistant
• It is mostly up to me whether or not to buy Smart Personal Assistant

What is the possibility, that in the near future you would buy a Smart Personal Assistant. Let us know how important are the following statements by responding to them from 1 to 7, where 1 is "totally disagree" and 7 is "totally agree".

14. Intention to buy:

• In the future, purchasing Smart Personal Assistant is something I plan to do
• In the future, I intend to purchase Smart Personal Assistant
• In the future, I likely to purchase Smart Personal Assistant

15. Willingness to Disclose Data:

While purchasing goods or services you are often asked to provide them your personal data. Please, specify how much are you willing to provide personal data of each type. Let us know how much you are willing to provide the following personal information by choosing from 1 to 7, where 1 is "totally disagree" and 7 is "totally agree".

• Home address
• Mobile phone number
• Email address
• Financial information
• Date of birth
• First name
• Last name
• Gender

Finally, please provide some basic demographic data.

16. Gender

• Male
• Female
• Other
• Prefer not to say

17. Please indicate your age in years (only numbers)

___

18. What is your monthly personal income?

• Less than €1000
• €1001-€1500
• €1501-€2000
• €2001-€2500
• €2501-€3000
• More than €3001

19. What is the highest level of your education?

• No formal education
• High school
• College
• Vocational training
• Bachelor degree
• Master degree

• Doctorate/PHD
• Other

Appendix 2. Reliabilities of Scales

Willingness to disclose data (WTD)

Reliability Statistics

Cronbach's Alpha	N of Items
.911	7

Propensity to Trust

Reliability Statistics

Cronbach's Alpha	N of Items
.981	4

Perceived Enjoyment

Reliability Statistics

Cronbach's Alpha	N of Items
.974	4

Perceived Usefulness

Reliability Statistics

Cronbach's Alpha	N of Items
.884	4

Perceived Ease of Use

Reliability Statistics

Cronbach's Alpha	N of Items
.952	4

Self-Efficacy

Reliability Statistics

Cronbach's Alpha	N of Items
.930	3

Privacy Concern

Reliability Statistics

Cronbach's Alpha	N of Items
.983	4

Privacy Awareness

Reliability Statistics

Cronbach's Alpha	N of Items
.950	3

Trust in the Product Category

Reliability Statistics

Cronbach's Alpha	N of Items
.597	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
9. Trust (in the product category)	9.27	5.382	.597	.211
9. Trust (in the product category)	9.13	6.280	.363	.558
9. Trust X (in the product category)	8.76	6.567	.287	.671

Perceived Risk

Reliability Statistics

Cronbach's Alpha	N of Items
.938	2

Attitude

Reliability Statistics

Cronbach's Alpha	N of Items
.975	3

Subjective Norms

Reliability Statistics

Cronbach's Alpha	N of Items
.983	3

Perceived Control

Reliability Statistics

Cronbach's Alpha	N of Items
.915	3

Intention to Buy

Reliability Statistics

Cronbach's Alpha	N of Items
.984	3

Appendix 3. Multiple regression scales

Regression analysis SPSS tables

H1 There is a positive relationship between attitude and intention to buy smart personal assistant.

H2 There is a positive relationship between subjective norms and intention to buy smart personal assistant.

H3 There is a positive relationship between perceived control and intention to buy smart personal assistant.

H4 There is a positive relationship between privacy concern and intention to buy smart personal assistant.

H5 There is a positive relationship between willingness to disclose data and intention to buy smart personal assistant.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.940[a]	.883	.881	.69296

a. Predictors: (Constant), WTD, PerceivedControl, PrivConc, SubjectiveNorms, Attitude

b. Dependent Variable: ITB

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1126.200	5	225.240	469.056	<.001[b]
	Residual	149.342	311	.480		
	Total	1275.542	316			

a. Dependent Variable: ITB

b. Predictors: (Constant), WTD, PerceivedControl, PrivConc, SubjectiveNorms, Attitude

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.642	.200		-3.220	.001
	PerceivedControl	.095	.034	.062	2.829	.005
	Attitude	.207	.065	.174	3.163	.002
	SubjectiveNorms	.650	.048	.648	13.423	<.001
	PrivConc	.185	.028	.174	6.592	<.001
	WTD	-.037	.036	-.030	-1.050	.294

a. Dependent Variable: ITB

H6 There is a positive relationship between privacy concern and willingness to disclose data.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.429[a]	.184	.182	1.44835

a. Predictors: (Constant), PrivConc

b. Dependent Variable: WTD

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	149.359	1	149.359	71.200	<.001[b]
	Residual	660.785	315	2.098		
	Total	810.144	316			

a. Dependent Variable: WTD

b. Predictors: (Constant), PrivConc

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.904	.205		19.088	<.001
	PrivConc	.364	.043	.429	8.438	<.001

a. Dependent Variable: WTD

H7 There is a positive relationship between perceived enjoyment and attitude.

H8 There is a positive relationship between perceived usefulness and attitude.

H9 There is a positive relationship between propensity to trust and attitude.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.780[a]	.608	.605	1.06235

a. Predictors: (Constant), PropToTrust, PerUsefulness, PerEnjoyment

b. Dependent Variable: Attitude

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	548.666	3	182.889	162.052	<.001[b]
	Residual	353.246	313	1.129		
	Total	901.912	316			

a. Dependent Variable: Attitude

b. Predictors: (Constant), PropToTrust, PerUsefulness, PerEnjoyment

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.728	.206		3.544	<.001
	PerEnjoyment	-.058	.094	-.055	-.621	.535
	PerUsefulness	.572	.091	.479	6.300	<.001
	PropToTrust	.368	.041	.459	8.933	<.001

a. Dependent Variable: Attitude

H10 There is a positive relationship between self-efficacy to trust and perceived control.

H11 There is a positive relationship between perceived ease of use and perceived control.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.690[a]	.476	.473	.94198

a. Predictors: (Constant), PerEaseOfUse, SelfEfficacy

b. Dependent Variable: PerceivedControl

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	253.257	2	126.628	142.708	<.001[b]
	Residual	278.619	314	.887		
	Total	531.876	316			

a. Dependent Variable: PerceivedControl

b. Predictors: (Constant), PerEaseOfUse, SelfEfficacy

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.201	.218		10.079	<.001
	SelfEfficacy	.302	.045	.349	6.767	<.001
	PerEaseOfUse	.376	.046	.420	8.139	<.001

a. Dependent Variable: PerceivedControl

H12 There is a positive relationship between privacy awareness & privacy concern.

H13 There is a positive relationship between perceived risk & privacy concern.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.849[a]	.721	.719	1.00189

a. Predictors: (Constant), PerRisk, PrivacyAwareness

b. Dependent Variable: PrivConc

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	815.159	2	407.579	406.047	<.001[b]
	Residual	315.185	314	1.004		
	Total	1130.344	316			

a. Dependent Variable: PrivConc

b. Predictors: (Constant), PerRisk, PrivacyAwareness

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.114	.162		.706	.481
	PrivacyAwareness	.443	.048	.411	9.211	<.001
	PerRisk	.534	.048	.498	11.172	<.001

a. Dependent Variable: PrivConc

H14 There is a positive relationship between trust in the product category and willingness to disclose data.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.700[a]	.490	.488	1.14515

a. Predictors: (Constant), TrustProduct

b. Dependent Variable: WTD

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	397.062	1	397.062	302.784	<.001[b]
	Residual	413.082	315	1.311		
	Total	810.144	316			

a. Dependent Variable: WTD

b. Predictors: (Constant), TrustProduct

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.655	.229		7.211	<.001
	TrustProduct	.875	.050	.700	17.401	<.001

a. Dependent Variable: WTD

Appendix 4. Multiple regression with mediating variable (WTD)

```
Model  : 4
    Y  : ITB
    X  : PrivConc
    M  : WTD

Sample
Size:  317

**************************************************************************
OUTCOME VARIABLE:
 WTD

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .4294      .1844     2.0977    71.2001     1.0000   315.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant    3.9045      .2045    19.0885      .0000     3.5020     4.3069
PrivConc     .3635      .0431     8.4380      .0000      .2787      .4483

**************************************************************************
OUTCOME VARIABLE:
 ITB

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .7486      .5604     1.7856   200.1704     2.0000   314.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant    -.4370      .2771    -1.5769      .1158     -.9823      .1083
PrivConc     .6496      .0440    14.7605      .0000      .5630      .7362
WTD          .3047      .0520     5.8618      .0000      .2024      .4070

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 ITB

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .7158      .5123     1.9747   330.9327     1.0000   315.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant     .7527      .1985     3.7928      .0002      .3622     1.1432
PrivConc     .7604      .0418    18.1916      .0000      .6781      .8426

*************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y ***************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI
      .7604      .0418    18.1916      .0000      .6781      .8426

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
      .6496      .0440    14.7605      .0000      .5630      .7362

Indirect effect(s) of X on Y:
       Effect     BootSE   BootLLCI   BootULCI
WTD      .1108      .0214      .0718      .1559
```

Double-click to activate

Appendix 5. Correlation of variables which linked to intention to buy smart personal assistant

Correlations

		Intention to Buy	Perceived Control	Attitude	Subjective Norms	Privacy Concern	WTD
Intention to Buy	Pearson Correlation	1	,403**	,863**	,924**	,716**	,505**
	Sig. (2-tailed)		<,001	<,001	<,001	<,001	<,001
	N	317	317	317	317	317	317
Perceived Control	Pearson Correlation	,403**	1	,440**	,345**	,288**	,313**
	Sig. (2-tailed)	<,001		<,001	<,001	<,001	<,001
	N	317	317	317	317	317	317
Attitude	Pearson Correlation	,863**	,440**	1	,889**	,613**	,682**
	Sig. (2-tailed)	<,001	<,001		<,001	<,001	<,001
	N	317	317	317	317	317	317
Subjective Norms	Pearson Correlation	,924**	,345**	,889**	1	,665**	,498**
	Sig. (2-tailed)	<,001	<,001	<,001		<,001	<,001
	N	317	317	317	317	317	317
Privacy Concern	Pearson Correlation	,716**	,288**	,613**	,665**	1	,429**
	Sig. (2-tailed)	<,001	<,001	<,001	<,001		<,001
	N	317	317	317	317	317	317
WTD	Pearson Correlation	,505**	,313**	,682**	,498**	,429**	1
	Sig. (2-tailed)	<,001	<,001	<,001	<,001	<,001	
	N	317	317	317	317	317	317

**. Correlation is significant at the 0.01 level (2-tailed).