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Working Paper

SILESIAN UNIVERSITY
SCHOOL OF BUSINESS ADMINISTRATION IN KARVINA

Institute of Interdisciplinary Research

Working Papers in Interdisciplinary Economics and Business Research

The Theoretical Framework for the Application of the TAM in Online Grocery Shopping

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August 2017

Working Papers in Interdisciplinary Economics and Business Research

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Citation

Bauerová, R. and M. Klepek, 2017. The theoretical framework for the application of the TAM in online grocery shopping. *Working Paper in Interdisciplinary Economics and Business Research no. 44.* Silesian University in Opava, School of Business Administration in Karviná.

Abstract

Radka Bauerová, Martin Klepek: **The theoretical framework for the application of the TAM in online grocery shopping.**

In today's world, the technology and internet reshaped the way products are ordered, delivered and consumed. More and more customers have internet connection thus opportunity to buy online. The products bought mostly online are mobile and IT, electronics, home and gardening equipment and fashion. On the other side of the spectrum is food. Thanks to high demands on logistics, companies entered the market in the Czech Republic gradually. One fourth of Czech customers tried buying food online and every tenth person buys groceries regularly. However, the relative turnover of online groceries to whole e-commerce market is low. Online retailers or e-retailers are therefore in constant search for understanding of consumer behaviour behind current situation. The aim of the paper is to formulate a theoretical model and formulate a hypothesis for consecutive model testing via structural equation modelling approach. The model will be suitable for online grocery shopping acceptance as a new technology in retail domain.

Key words

Technology acceptance model, TAM modification, online sales, online shopping, online grocery shopping

JEL: M31

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Acknowledgement

This paper was supported by the Student grant competition project SGS/7/2017:" Acceptance of technology from the perspective of marketing tools."

Introduction

E-commerce business is changing the way people acquire goods and services. In many categories, the penetration of e-commerce businesses has grown steadily. To this day, in only a few countries has e-commerce expanded permanently into groceries category. There is still no clear explanation on why is this happening. Why the tempo is different for different nations and what causes adoption of this technologies generally. For this reason, the Technology acceptance model seems suitable measure. However, the model has been dominantly defined for technology acceptance of information systems. Suitability for grocery e-commerce is questionable, therefore we would like to propose an upgraded model which would reflect specifics of this category.

The original model of technological acceptance (TAM) was proposed for Information Systems area by Davis in 1986. His model examined the effects of system characteristics on the adoption of computer information systems. Over time, however, the model has evolved dynamically and adapted to various areas of knowledge (e.g. the wireless internet, World Wide Web, smartphone usage, internet banking, online shopping and healthcare IS). Researchers were based on original three factors (perceived ease of use as PEOU, perceived usefulness as PU and intention to use as BI), which explaining users or consumers' motivation, and then added additional variables specifying the field of interest to be investigated, or improving the model´s predictive capacity. Thus, the design of the model included not only the PEOU, PU and BI variables, but also factors as attitude, perceived risk, enjoyment, social influence (Ingham, Cadieux and Berrada, 2015), trust (Dahlberg, Mallat and Oorni, 2003), consumer traits, situational factors, product characteristics, previous online shopping experiences (Monsuwe, Dellaert, and Ruyter, 2004) and demographic factors (Porter and Donthu, 2006).

It can be said that the design of TAM is applicable for different field of interest associated with the acceptance of new or existing technologies. Of course, it is necessary to choose suitable factors well. The field of online grocery shopping (OGS) was select as the purpose of this working paper. The reason for this choice is the development of Internet sales of food in Czechia. Internet sales of food have tended to grow since 2003, with year-on-year sales of e-tail is rising by 2,0 % in June 2017 (ČSÚ, 2017). Another reason for this is the development of online grocery shopping in Czechia, as the number of purchases made is constantly increasing and this category has the greatest growth potential in the future according to research organizations (STEM/MARK, KPMG). For these reasons, there is a need to construct TAM for the OGS. The aim of the working paper is to formulate the theoretical framework and suggest hypotheses for the subsequent testing of the model for the sphere of online grocery shopping.

1. Aspects of online grocery shopping

In traditional retail, we identify the Hedonic motive (shopping for fun) and the Utilitarian motive (shopping with a goal in mind) as the dominant shopping motives of customers (Wolfinbarger and Gilly, 2001). However, these dominant shopping motives also exist in the online grocery shopping. Childers et al. (2001) identified factors as flexibility in navigation, convenience and substitutability of personal examinations as the unique aspects of the online environment that these new media bring. These aspects create a pleasant virtual environment supporting the hedonic shopping motive. While in the hedonic motive of shopping is the enjoyment a strong predictor of attitude, in the utilitarian motive is usefulness a predictor of

the attitude. Although instrumental aspects of new media are considered as important predictors of online attitudes, the hedonic aspects of new media play at least the same role.

In online grocery shopping are many other motives and factors that influence the attitude towards buying food online. The study, conducted in 2000, examined American consumers who buy food online shown that the main reason for buying food online is convenience and time-saving. Online shoppers also described the benefits of online shopping as better planning and purchasing control, able to control recipes and the state of the food stock when shopping from home. The study also revealed other interesting aspects of online grocery shopping. For example, the segment of mothers with small children has been especially positively inclined to buy food online. Respondents said online shopping gives access to food without the need for babysitting for their children, and they do not buy the sweets that children in traditional stores require. People with disabilities have also announced that buying food online is a welcome alternative. Respondents from the above study also stated that they are buying online because they have physical problems to complete the buying task in the traditional shop, especially due to the difficulty of lifting food and transporting food home. (Morganosky and Cude, 2000)

Online food shopping has also been explored by a much more experimental method. In 2006, scientists developed a model of neural networks for six product categories, to predict and explain consumer choice between online purchasing and buying in traditional stores. The model identified factors that have a significant impact on customer attitudes through the sensitivity of neural network analysis. In the food category, they have identified the attributes affecting the choice of the shopping channel. These attributes include special sales, discounts, vouchers, immediate product holdings, uncertainty about obtaining the right item, accepting all payment methods, product quality, product comparison, interesting social or family experiences, and easy product browsing. These attributes belong to the area of economic factors influencing attitudes towards online purchasing. (Chiang, Zhang and Zhou, 2006)

Researchers also focused on examining situational factors and their impact on influencing food purchases online. Situational factors can be key to starting shopping online. Situational variables and life events (such as taking a baby, caring for elderly parents) are thus the triggers for starting online food purchases, precisely because of the convenience of buying online. Researchers, however, suggested that situational factors are not only trigger and breaker frequencies of online food purchases, but can completely stop food shopping online, especially when the initiating situation returns to normal. (Robinson et al., 2007; Hand et al., 2009)

In literary sources, the most commonly cited positive motivation to buy online is convenience (Morganosky and Cude, 2000; Childers et al., 2001; Ramus and Nielsen, 2005, Robinson et al., 2007), but there are also demotivating elements that force customers Re-evaluate their decision to continue shopping online. Web stores empower consumers with the ability to make informed decisions, but also have their inherent limitations (Chiang, Zhang and Zhou, 2006). Negative elements of OGS are problems with the quality of services and deliveries (Robinson et al., 2007; Ramus and Nielsen, 2005), e-tailer delivery charges, privacy and security risk (Huang and Oppewal, 2006), exchange refund policies for returning products, missing sales assistants, post-purchase services, and uncertainty about getting the right item (Kacen, Hess and Chiang, 2013) and the loss of recreational aspect of food purchases (Ramus and Nielsen, 2005). However, Huang and Oppewal (2006) argue that delivery charges are not the most important factor influencing the consumer's shopping channel preference, as they have found that a fifteen-minute difference in travel to a business has a greater impact on the

relative preference to buy online unless the delivery fee is 5 pounds. Customers are therefore willing to pay a certain amount of delivery fee. These disadvantages of online grocery shopping have not been overcome at the time of research by the benefits of online shopping (extensive selection of brands and product types, easy browsing, convenience, time-saving).

1.1. A typology of online grocery shoppers

Based on the grocery-shopping context, both positive and negative aspects of online grocery shopping, the typology of these online customers has been created.

Four types of online grocery shopping are identified by factor analysis: convenience shoppers, variety seekers, balanced buyers and store-oriented shoppers. The convenience shopper is the least represented group of customers (only 11% of the sample) and is highly motivated to the convenience of online shopping. This customer segment exhibits less physical store orientation, which is less motivated by the possibility of immediate possession of purchased goods or services and social interaction. The variety seeker is the largest group in the sample (41% of the sample) and customers are only slightly motivated by the convenience of online shopping, motivating primarily the variety of product types and brands in e-tail shopping. The third group is a balanced buyer (33% of the sample), who are characterized by the desire for convenience and the lowest tendency to plan or search for information and have a medium desire for physical business orientation. The last group is the store-oriented shopper (15% of the sample) that characterizes the lowest level of online shopping convenience and the highest level of physical store orientation. This group has a great desire for immediate possession of goods and social interaction. (Rohm and Swaminathan, 2004)

The knowledge of this typology is beneficial to e-tail as it can target its actions to the extent possible to the given groups.

1.2. Innovation in online grocery shopping

The right step to achieve the satisfaction of individual types of shoppers are innovations that are nowadays in the forefront of companies' interest. Thanks to innovation, we are able to alleviate or even eliminate the negative aspects of online food sales. Today "delivery passes" is a regular service when the owners of this service can make free home delivery of online food. Delivery passes allow to pay a one off or monthly payment instead of paying a delivery charge. Customers will not have to pay the delivery charge for any of their online grocery shops for the duration of the delivery pass after purchase it. This service is also positive for e-retailers as it generates loyal customers, and it has been found that customers owning delivery passes buy online grocery more often. This innovation is definitely good for the convenience shopper because it increases the convenience of the purchase itself (no need to order at a certain time to get the minimum delivery cost).

Other innovations in online food sales are also the same-day Click and Collect (Tesco), Stand-alone collection points at railway stations and other dense population locations (Asda), Purpose-built urban fulfilment centre that can handle 25,000 orders per week from which it has been trialling same-day deliveries (Sainsbury's). These innovations may be appropriate for a store-oriented shopper because they reduce the process time from online ordering to food delivery. The interesting innovations of online grocery shopping are "In-Fridge Delivery". The Swedish mainstream food retailer ICA introduced this innovation. It is a trial service in

Stockholm with a technology and a logistics provider in which online food and drink orders are delivered directly to the consumer's refrigerator. They called it In-Fridge Delivery, as they make it without a customer needs to be at home to receive groceries, and they use digital local and key technology to provide the home and fridge access provider. (Allen et al., 2017)

These innovations would certainly be positive for a balanced buyer group, as they have the least tendency to plan a purchase or search for information. For the last group of the above typology, could be positive a "smart fridge" innovation. This innovation is available in the US where Samsung and Mastercard have jointly developed an intelligent refrigerator that can use Mastercard app to create shopping lists and orders to be delivered to their home.

1.3. The basis for designing the TAM in online grocery shopping

There are two known TAM modification for OGS in the literature. These two models, however, differ significantly in their results and constructions. Model of Hansen (2006) helping to understand what factors determine repeat buying behaviour of experienced online grocery consumers. It was found that the perception of offline physical effort positively affects OGS. Research results, however, suggest that the joy of offline shopping has a negative impact on the attitude to OGS and the time pressure does not significantly affect the attitude to OGS. Also, high online complexity was a factor that can lead consumers to repeat online shopping. As you can see in Figure 1, it is interesting that the author of research left out the basic factors – PU and PEOU, set by Davis. This research was aimed only at those consumers who are already buying food online.

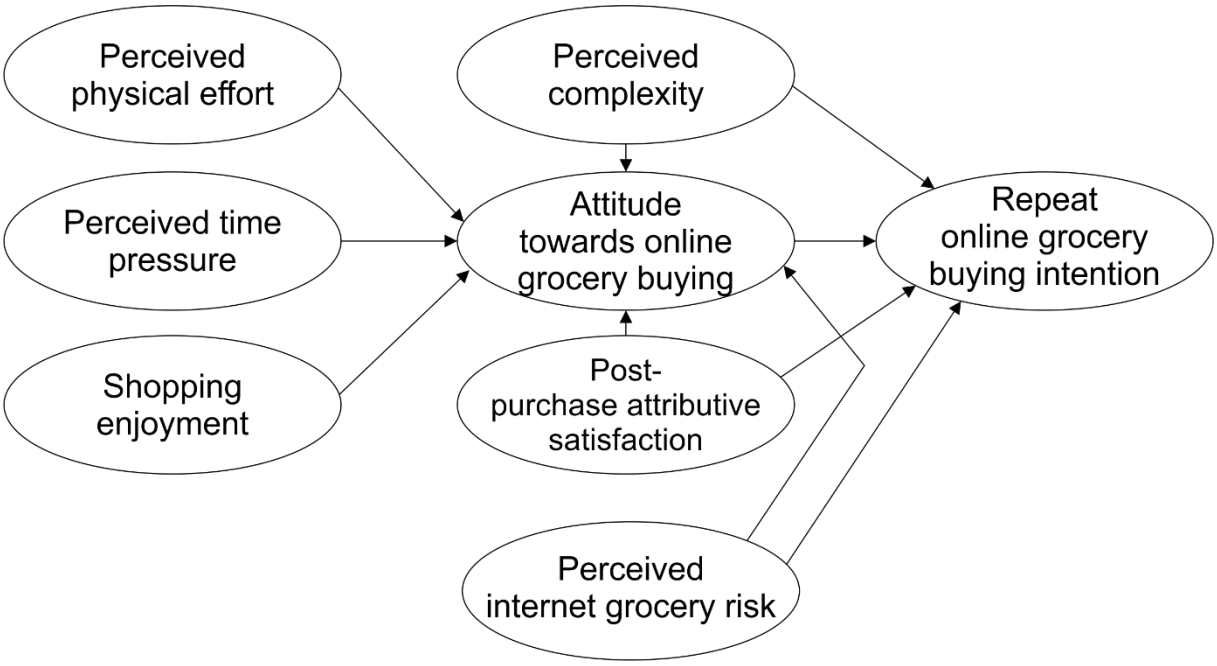

Fig. 1: Hansen repeat OGS model
(Source: Wolf, 2012)

Research focusing on both consumers who have already made purchases of food online and those who have not yet was conducted in Germany. Wolf (2012) identified different factors in her research (Figure 2), which operates on OGS. Her research suggests that consumers who are under time pressure have a high perceived convenience or made positive

experiences with OGS. She found that people who had purchased food online would buy these foods online rather than not OGS- experienced.

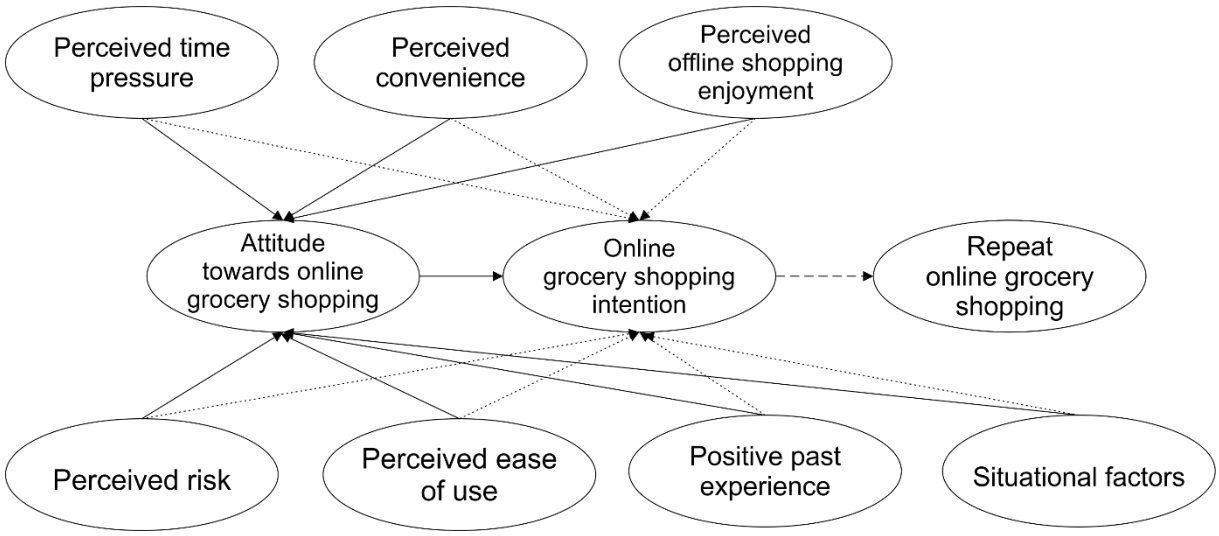

Fig. 2: E-Grocery shopping acceptance model
(Source: Wolf, 2012)

These two studies differ in the fact that while Hansen (2006) did not confirm the influence of time pressure factor on attitude, Wolf (2012) suggests that this factor has a positive influence on OGS.

In constructing the TAM modification for OGS in the Czech Republic, we will proceed:

• From the theoretical framework focused on online food sales, taking into account aspects arising from the geographical, economic and demographic background of the Czech Republic where the research will be carried out

• Of the factors influencing TAM in online shopping in general

2. TAM modification proposal for online grocery shopping

By the literature review focused on TAM in online shopping and online grocery shopping, external variables were selected for OGS research in the Czech Republic. The specified external variables were subsequently added to the Technology Acceptance Model so that TAM modifications for OGS could be constructed. As external variables, social factor, perceived risk, trust and situational factors were selected. These variables were selected taking into account the aspects of the Czech grocery market. The proposed model also involves attitude factor that increases the predictive capacity of the model by almost 9% compared to the classical TAM (Ingham et al., 2015).

Social factor

This factor explains the social impact of society. Consumers nowadays do have not only the social impact of their close surroundings (family, school, work) but also the effects of blogger´s recommendations.

Perceived risk

Another important factor in buying food online is perceived risk. Online food shopping has many aspects that can be risky for the customer. Into these aspects should include products being sold quickly, at a low price, having a limited consumption time and are quickly

consumed. Perceived risk should be subdivided into social risk, financial risk, privacy risk, supply risk, quality risk, health risk and after sale risk (Almatarneh, 2016).

Trust

Trust is a set of specific beliefs about the trustworthiness of the vendor, the service provider, or the website in two cases, as a feeling of confidence and security about online transactions and as a mix of trustworthiness in the vendor and a feeling of confidence in the transaction (Ingham et al., 2015).

Situational factors

Situational factors and life events (such as taking a baby, caring for elderly parents) can be key to starting shopping online (Robinson et al., 2007). Situational factors include time pressure, lack of mobility, geographical distance, need for special items and attractiveness of alternatives (Monsuwe´et al., 2004).

The proposed TAM modification for OGS is illustrated in Figure 3.

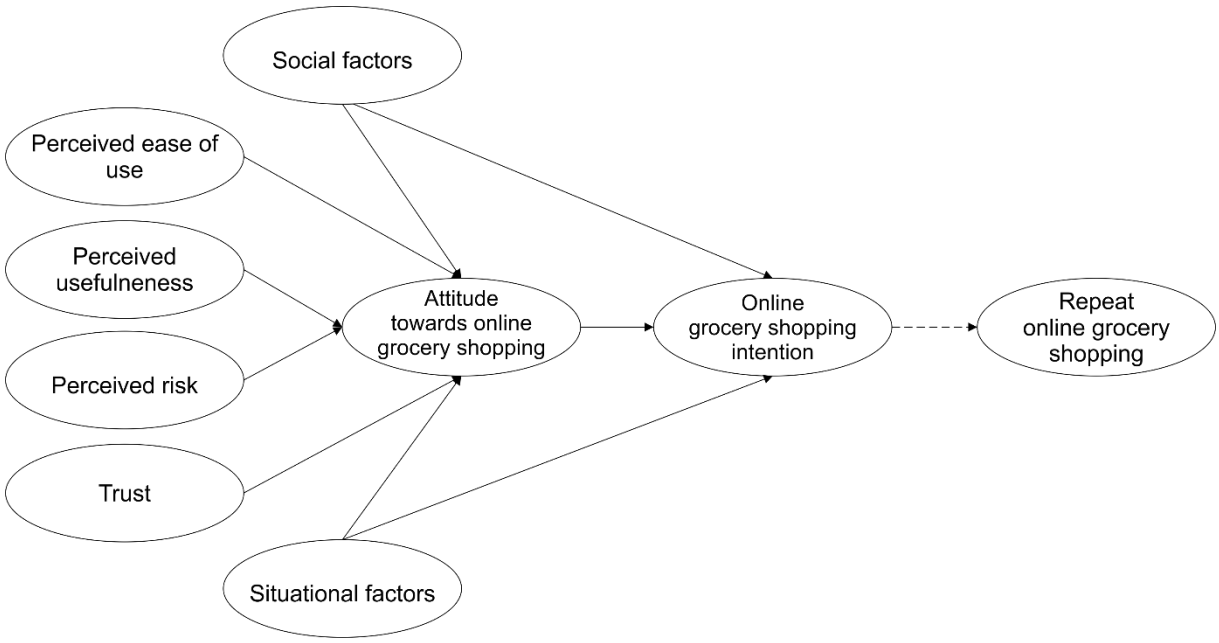

Fig. 3: Theoretical E-Grocery shopping acceptance model

(Source: own)

The modified Technology Acceptance Model for OGS will be tested by exploratory factor analysis to determine the group of variables behind the common factor (latent variable). Confirmatory factor analysis will then be used for verification.

Based on these two analyses should be TAM for OGS accepted as a statistically significant model for explaining consumer behaviour and their attention to buy, or rejected.

2.1. Modeling questions for model testing

The specific questions for construct testing are set out below.

Perceived Usefulness

1. Using a website to buy food is useful for setting optimal buying frequency.
2. Using a website to buy food gives me more control over the value of my purchase

3. Buying food online is useful to me because I do not have to travel to the grocery store.
4. Online grocery shopping is useful because it reduces my physical burden of shipping from a home shop.
5. By using a website to buy food online, I can better plan my purchase.

Perceived Easy of Use

1. Orientation on a website to buy food online is easy.
2. The transition from ordering food online through a web site to the final date of delivery and payment is quick and easy.
3. Using a website to buy food online requires a lot of mental effort. (Davis, 1989)
4. It´s easy for me to remember how to do the things needed to buy food online through a website. (Davis, 1989)

Attitude

1. I feel positive about using a website to buy food online.
2. I think using a website to buy food online is a good idea.
3. I think using a website to buy food online is just as safe as buying food in traditional retail.
4. Using a website to buy food online is more flexible for me (more adaptable) than buying in a classic store.
5. Using a website to buy food online is nice.

Intention to buy

1. Assuming I have access to online food shopping website, I´m going to buy the food online through them. (Venkatesh and Davis, 2000)
2. If the business organisation in which I used to buy food started to provide this service, I would buy the food online as well.
3. In the future, I will be buying food online but irregularly.
4. I will use the online food service just for bulk purchases.
5. I intend to use the website to buy food online during events (festivals, world championships…)

Perceived risk (financial risk, delivery risk, healthy risk and quality risk)
Financial risk

1. I feel safe when using the payment data needed to trade money to buy food online.
2. I believe that the price of food will not change during service.
3. I believe that I will not have a financial loss in the case of irregularities in the ordering and delivery of food.
4. Traditional stores can offer a larger discount than an online food retailer.

Delivery risk

1. I am afraid that food ordered online during delivery is delayed.
2. I believe that the price of imports will not change during service.
3. If I buy food online at established business organisations on the Czech market (for example Tesco, Kaufland, Globus, Albert, Lidl…), I´m not afraid of not delivering the goods.

4. If I buy food online on websites such as rohlík.cz, košík.cz, freshbedynky.cz, colonial.cz, sklizeno.cz, plnátaška.cz, potravinydomu.cz, z-market.cz, nakuptesi.cz, so I do not worry from non-delivery of goods.
5. I´m afraid that other foods can be delivered to me than I ordered.

Healthy risk

1. I am not worried about my health if I buy food online at established business organisations on the Czech market (for example Tesco, Kaufland, Globus, Albert, Lidl ...).
2. I am not worried about my health if I buy food online at web sites such as rohlík.cz, košík.cz, freshbedynky.cz, kolonial.cz, sklizeno.cz, plnátaška.cz, potravinydomu.cz, z-market.cz, Nakuptesi.cz.
3. Overall, I'm worried about my health when buying food online.
4. I believe that the food offered online meets all the conditions of legislation related to the production and distribution of food.
5. By buying food over the internet, I save my health because I do not have to pull heavy home shopping.

Quality risk

1. I believe that the quality of food purchased in e-tail is the same as the quality of food purchased in retail.
2. Food quality decreases during delivery.
3. I believe that the food delivered online will be of the same composition as food purchased in the classic shop.
4. I believe that the food contains the same amount of raw materials as it was mentioned on the website.
5. I am afraid that the foods purchased online will be just before the date of consumption.

Trust

1. I believe that protecting my personal data will be important for online retailers (e-tailers).
2. I believe that the ordered food will be delivered by the online retailer at the agreed time.
3. I believe that the price of food provided online is the same as the price provided in the traditional retail.
4. I feel that I can trust online food sales websites if they are established business organisations on the Czech market. (For example Tesco, Kaufland, Globus, Albert, Lidl)
5. I feel like I can trust websites selling food only online (for example, rohlík.cz, košík.cz, freshbedynky.cz, kolonial.cz, MyFood Market-sklizeno.cz, plnátaška.cz, potravinydomu.cz, z-market.cz, Nakuptesi.cz)

Social influence

1. The behaviour of my acquaintances (buy / not buy online foods) will influence my decision to buy food online.

2. Buying food online increases my prestige between family, friends, colleagues from work, acquaintances.
3. Online grocery shopping improves my image (overall impression).
4. It affects the behaviour of a majority who does not buy food online.
5. I think influencer (known personalities, bloggers) could get me to try to buy food online through websites.

Conclusion

The technology acceptance model (TAM) has been repeatedly used to measure aspects of online shopping attitudes and intentions to adoption of this type of buying behaviour. However, the use of the model in the unaltered form to measure online grocery shopping attitudes is not possible. Groceries have many specifics such is limited durability of food, supply fragility or higher delivery time requirements. Therefore, buying process evokes many additional risks for the customers compared to traditional online shopping experience. Reframing the model to explain attitudes and intentions of consumers is than crucial for progressive development of this part of e-commerce scene. Hence, we proposed our own model based on previous research and designed specific question to test the model validity and reliability in our future research.

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