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Ridesharing in the Polish Experience: A Study using Unified Theory of Acceptance and Use of Technology

Abstract
The main aim of this article is to examine the factors that influence the acceptance of ridesharing technologies in Polish society, including dynamic vanpooling on demand. The study was conducted using the UTAUT 2 model (*Theory of Acceptance and Use of Technology)*. We have employed statistical and econometric data analyses such as factor analysis and linear regression using the Partial Least Square (PLS) method. Based on the review of the publications on ridesharing in the context of sharing economy, we have modified the UTAUT 2 model by supplementing it with the trust factor, which is a significant contribution to the development of this theory when applied to the acceptance of ridesharing technologies. Further, the outcomes allowed us to identify the factors that influence people's attitudes in using shared-ride technology (performance expectancy, hedonistic motivation and habit) and the intention to use this technology (effort expectancy, performance expectancy, price value, habit and trust). This study has practical implications as it has helped identify the factors that affect the acceptance of ridesharing technologies in Poland and these factors are significant for the suppliers of these technologies. The findings can certainly become a starting point for further research on other communities and the application of other models of technology.

Keywords
sharing economy | ridesharing | vanpooling | Technology Acceptance Model | Unified Theory of Acceptance and Use of Technology

JEL Codes
O30, O33, M10

1 Introduction

The concept of shared economy has revolutionised business models in many sectors of the economy in recent years, such as the passenger transport market. Uber, Taxify, Didi, Ola and BlaBlaCar are the most famous platforms that use shared mobility technologies and they are studied frequently (Agatz, Erera, Savelsbergh, & Wang, 2012; Constantiou, Marton, & Tuunainen, 2017; Virkus, 2017). New social, cultural and economic trends, such as suburbanisation, transport autonomy, sustainable mobility and growing environmental awareness mean that social behaviours are shifting towards sharing mobility instead of owning cars (Shaheen & Cohen, 2018). Frost and Sullivan (2016) estimate that the number of carsharing vehicles globally will be increased from 112,000 in 2015 to 427,000 in 2025, while the number of users of this service worldwide is expected to rise from 7 to 36 million. These trends and forecasts provide a strong rationale for research on shared mobility, which has not been widely studied in the countries of Central and Eastern Europe (Tóth, & Szigeti, 2019).

Generally, different terms characterise the business models used by the sharing economy in the area of passenger transport and mobility as well as both in practice and in research. (Frenken & Schor, 2017; Ma & Wolfson, 2013). Ridesharing is the most widely defined: it is a service of sharing and/or access perceived in a very broad spectrum (What is ride-sharing, 2018; Agatz et al., 2012; Virkus, 2017; Ma & Wolfson, 2013). In simple terms, ridesharing is a ride or a contract for a ride arranged by an application or website, where the driver offers to share free places in the car. A driver may offer a free place in such a trip for in return for reimbursement for costs or for an additional fee that exceeds the incurred costs (Geron, 2013). Usually in the literature, ridesharing is not only understood as cost compensation rides and commercial transport services such as *Lyft, Uber* and *Taxify* are described with this term.

This study aims to investigate about the factors that influence the attitude towards using new ridesharing technologies in Poland, based on the *Unified Theory of Acceptance and Use of Technology* (UTAUT). Moreover, we intend to propose to expand the UTAUT 2 model (the second version of the UTAUT model will be discussed later) with factors specific to technologies depend on collaborative economy, which will constitute an innovative element of this study. The research hypotheses will be formulated based on the current applications of the UTAUT 2 model, which will help while introducing new technologies to the market.

The structure of the article is as follows: The Background section defines the business model and the ridesharing market in the context of collaborative economy. Further, it presents, the recognised models used in introducing new technologies to the market, specifically Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology. The next section of the article includes an empirical study of the acceptance of an innovative transport service, namely dynamic vanpooling on demand – one of the types of ridesharing technologies in which shared rides are offered to accommodate larger group of people, given the bigger size of the car (an SUV, a van and sometimes even a mini-bus).

Based on the existing theories and various literatures, a modified model of acceptance and use of the technology is proposed. The study will show what extent the various factors influence Poles' intention in using innovative shared mobility services. Further, the factors that do not influence the decisions of Poles in this area are identified.

2 Background: ride-sharing

2.1 Ride-sharing in the context of the shared economy

It is not easy to provide a clear definition of *sharing economy* or *collaborative consumption*, as many researchers corroborate on the issue (Botsman & Rogers, 2010; Schor, 2016; Gyódi, 2017). The topic of collaborative consumption with other market participants, consumers, was first addressed by (Felson & Spaeth, 1978). In recent studies, the authors refer to this new sector extensively as the sharing economy (Constantiou et al., 2017; Schor, 2016). The sharing economy is an economic phenomenon which involves a fundamental change in the business model, especially in terms of organisation and distribution. This change involves direct exchange of services between people, co-sharing, co-creation and also co-buying, which significantly increases the efficiency of using various resources (Rinne, 2015). Sharing economy is also a form of business that exploits new technologies like the Internet as an exchange system. It is a way of making resources of one individual accessible to many individuals, either for a fee or free of charge. In the sharing economy, the trade of resources is not based on ownership, but only access, which is related to the idea of co-sharing (Pietrewicz & Sobiecki, 2016). According to the data from the PwC report, by 2025, global revenue from the sharing economy in five key sectors (financial services, transport, hospitality and tourism, and professional services) will amount to $335 billion (PwC, 2016).

The most popular business models in the transport sector are connected with *ridesharing.* The B2C model known as carsharing is car rental by consumers from companies, usually for particular period of time within cities. There are also solutions such as scooter sharing, the difference being the rented vehicle, a scooter. Another type is peer-to-peer car sharing, where the car is owned by a private person who rents his or her own car for a certain period of time (SUMC, 2018). Peer-to-peer motorcycle sharing or bike sharing also operate in a similar model which is set up as a station-based system (the bike is locked to a special rack) or as a dockless system (we can leave the bike anywhere in the designated zone of the city) (Geron, 2013; SUMC, 2018). An occasional road trip with a stranger (mainly on long journeys and most often without compensation for costs) called hitchhiking, which is popular in some countries, which is a variation of shared travel. (Geron, 2013). There is another term that is closely related to the notion of ridesharing is slugging, defined as a shared ride (often free of charge), whose main purpose is being able to use the so-called carpooling lanes or HOVs *(*high occupancy vehicle lanes*)* (Sluglines, 2020).

In carpooling, the car owner offers passenger seats available for a shared ride (Ma & Wolfson, 2013; Cohen & Kietzmann, 2014). Generally, the driver is not interested to make profit but only to have the fellow passenger cover the travel costs. Carpooling can help in reducing traffic congestion and environmental pollution, which are the additional motivators to share a ride. Chan and Shaheen (2012) also identify Nonprofit/Cooperative Carpooling as a type of a ridesharing non-profit service. Targeted at a larger group of people, vanpooling signifies shared rides in an SUV, a van and sometimes even a mini-bus (Cohen & Kietzmann, 2014). P2P ridesharing is a business model that harnesses the power of new technologies in the area of mobility and geolocation to enable real-time ridesharing/on-demand ridesharing (Ma & Wolfson, 2013). Such transport services (Uber, Lyft) have led to a significant reduction in travel costs, and spurred a major competition for taxi operators (Cohen & Kietzmann, 2014).

Generally speaking, such transport services can be defined as a service model belonging to the Mobility as a Service (MaaS) or Transport as a Service (TaaS) model (Jittrapirom et al., 2017). This model aims to bridge the gap between public and private transport, both within and between cities, and even internationally (Kamargianni & Matyas, 2017). The users of the MaaS model can travel in the most comfortable way by combining different forms of transport without owning any means of transport. At the same time, it is important to optimise the use of these vehicles, not only in terms of speed of transport or avoiding traffic jams, but also other user needs, such as the cost of travel, comfort, privacy, the level of generated carbon emissions, or even the preferred amount of physical activity (duration of activity, burned calories) (Smolnicki, 2017).

2.2 Ride-sharing: literature and market review

Using cars for single occupants or persons to move around the city is very costly for various reasons (Merat, Madigan, & Nordhoff, 2017). According to the PwC estimates, the total annual cost of maintaining a car in Poland is approximately EUR 3,400 (PwC, 2018). It is important to note that the average number of occupants in a passenger car, which usually accommodates 5 people, is 1.4 in Warsaw. It follows that one Solaris Urbino 18 bus (Solaris, 2018) (including standing places) would be enough to replace 125 cars. If the sitting places alone are considered, it would replace 30 vehicles. Other costs of individual use of cars are related to environmental pollution, the generated noise, infrastructure maintenance, building the necessary roads and parking spaces (Massaro et al., 2009). All these costs can be brought down by traveling together and as a result, the number of cars on the road will be reduced (Merat et al., 2017).

Researchers who study sharing rides in Delhi suggest that there are several other reasons for it besides reducing the cost of owning and maintaining a car (Dewan & Ahmad, 2007). Shared rides significantly reduce the already stated infrastructure needs, such as parking lots. Many scholars also mention other positive effects such as minimising traffic congestion and offsetting carbon emissions. Furthermore, companies may too enjoy the advantages of shared mobility. Employees who commute together do not need so many parking spaces. Carpooling can act as a socializing agent, and as a result, increase the workers' attachment to the company, their productivity at work, and the pleasure derived from it. More frequent, positive interactions with people also lower our stress levels. Bolstering the company's image as green, supporting sustainable development and efficient use of resources has a positive effect on its perception among customers and potential employees (Dewan & Ahmad, 2007).

The biggest problem encountered by non-profit carpooling on demand is achieving the so-called critical mass for the system to operate smoothly, i.e. the number of active users at one time (both passengers and drivers) and the number of trips (Dybalski, Mosiej, Puzyński, Syryjczyk, & Grobelny, 2017). Achieving the the right number of occupants is influenced by many variables, which include the reasons to choose this form of travel and the reasons not to. One of the key incentives of shared travel is the economic factor, the reduction of travel costs. However, this includes not only the fuel consumption, but also the total costs of owning a car, including tire wear, parking, insurance and so on. So, the purpose is not only to limit these single user costs, but to limit the overall costs of transportation (for cars, buses, subways, trams, taxis and others). Ecology is getting more and more attention due to the growing awareness of the negative impact of many activities on the natural environment, and consequently also on society. The comfort of using a shared ride in exchange for a fixed fee is usually higher than taking public transport (at least in Poland) and remains slightly less convenient than traveling by taxi (travel comfort comparable to carpooling). Shared rides are a good way to reduce surplus car traffic in the city. They not only cut the number of cars, but also eliminate unnecessary car traffic caused by searching for a parking space (especially during rush hour). It is estimated that up to 30% of traffic in large cities is created by people searching for parking spaces (Dybalski et al., 2017). Social aspect factor should be considered and may also encourage drivers to consider carpooling as an alternative. When people feel that they belong to a social group and positively identify with it, they are more eager to travel together. Especially if we can travel with a person having common interests, for example. The obvious element that supports and facilitates traditional carpooling is technology (Ciasullo, Troisi, Loia, & Maione, 2018). The latest technological advances, such as driverless cars, can become a solution to the above problems. They are still at a nascent stage of evolution, but it is predicted that they will be much safer 'drivers' than humans, as most accidents are caused by human error, which can be eliminated in these vehicles (Blanco et al., 2016).

Some factors negatively affect the willingness to use shared rides, which impact the efficiency of such rides: people do not use them when lanes for cars with more occupants are being introduced. This necessitates a reduction in number of lanes for other vehicles, which may increase the risk of higher congestion, fuel consumption or deterioration of air quality (assuming that the number of cars on the entire route will not decrease significantly). Another deterrent is moderate flexibility, especially in traditional carpooling. Lack of trust and security also discourage potential users from taking carpooling trips. According to research conducted by Ciasullo et al. (2018), establishing proper trust considerably increases the likelihood of effective transport sharing. Trust in the technology used and the people behind it appear to be the key factor in the adoption and use of ridesharing. BlaBlaCar has prepared the report *Entering the trust age* (BlaBlaCar, 2016) which explored the issue of trust. Using their case study, the company laid the foundations for building trust in online communities –acronymised as *D.RE.A.M.S.* According to this research, online peer-to-peer trust is a combination of six pillars. The first one is the Declared information in user profiles, which is voluntary. People may choose to provide their age, gender, first name, surname, preferences, and interests. By describing themselves, they also build more trust with the other party, especially if they do so voluntarily. The next pillar is Rating, meaning feedback, which reflects on the person's reputation as a user of the service. It can come in the form of a score or comments on the online profile. The third element is the Engagement of both parties and considering their obligations seriously, such as arriving at the agreed place to start the journey or paying for the trip in advance. Another factor is the Activity of members of the Internet community. This activity can be measured by analysing the reaction time and responses to the other party's questions requested through the application. The next important pillar is user information, which should be Moderated by a third party. Other users need to know that the information on their profile is true and voluntarily shared. The last pillar is Social, i.e. meaning that one's online identity has been confirmed e.g. by linking their profile with social networks like Facebook or LinkedIn (BlaBlaCar, 2016). These factors seem to be consistent and logical, but it is worth to pay attention to the commercial nature of the study and the lack of detailed information on the research methodology and sample selection.

BlaBlaCar's survey carried out among the users in France by the University of California in collaboration with the University of Lausanne found that carpooling users are more educated than the population mean and their income is quite similar. People with lower incomes were more often passengers, and those with higher incomes – the drivers. Students used shared rides more often than others, which are same people who had the Blablacar application installed on their phones. Despite these general results, the study found that the income, education level and age are statistically insignificant (Shaheen, Stocker, & Mundler, 2017). There are few Polish studies on collaborative consumption relating to the factors influencing the effectiveness of ridesharing services. One among was conducted on BlaBlaCar users in which the inclination to take shared rides was examined (Małecka & Mitręga, 2015). According to this study, the pleasure associated with making new friends while travelling together, the sense of community within the service, and price sensitivity all influence the tendency to use ridesharing. But, pro-ecological behaviour, age and perceived financial status do not matter and however, the factor that the sample was quite small (n = 117) should be considered and the study was conducted mainly on a group under 35 years of age. Another study on the people of commuting to and from work in Sweden shows that loss of flexibility and independence is the biggest barrier to shared travel (Bauer, 2017). It is hypothesised that despite the reduction of costs, car traffic volume and exhaust emissions, and despite increasing the number of parking spaces, it is not easy or even possible to achieve the critical mass needed to run an on-demand carpooling service. Rather than providing additional benefits from sharing rides with others, it might be better to reduce the need for flexibility which is mainly required by people who have children or who need to do shopping. Such an effect, although obviously unintended and unwanted, was caused by the Covid-19 pandemic, which reduced our need for flexible shopping and made us aware that we can shop online more often (Sharfuddin, 2020).

The Ciasullo, Maione, Torre, and Troisi (2017) study lists the most common categories of hashtagged keywords that were used together with *#carpooling*. The category in the first place was *'Money'* with hashtags such as *#money saving, #money, #savings, #saving*. The second-place category was *'Sustainability' (#sustainability, #air pollution, #smog, #health, #nosmog, #environmentalism, #environmentally friendly)*. The third place category, the hashtag *'Traffic'* was often accompanied by *#traffic, #traffic congestion, #congestion*. The results of this study are in line with our intuitive guesses and suggest what people associate carpooling with, what connotations they have and why they use this form of transport.

The research carried out by Olszewski, Pałka, and Turek (2018) on the use of carpooling in smart cities on groups commuting to offices reveals that the number of people traveling together to work is not only influenced by the cost of carpooling, but also the patience of the users. Moreover, gamification, geoinformation technology and decision support systems have a large impact on the popularisation of carpooling, which according to some models, allows us to reduce the number of cars by 65% without the need for any infrastructural changes, while maintaining the same number of passengers. Technologies alone are not enough to create truly smart cities: an active contribution of residents who are able and willing to function with these innovations is necessary.

A survey of almost 5,000 Americans showed that 15% of them use ridesharing applications, but only 1/3 knows about such solutions (Smith, 2016). This form of travel is more popular among the group of young, educated people from large urban agglomerations. Moreover, regular ridesharing users exhibit little interest in purchasing their own car compared to other means of transport. Amirkiaee and Evangelopoulus (2018) have shown that not only the users' attitudes towards carpooling are important, but also frustration with heavy traffic, congestion, insufficient parking spaces and distance. In addition, people who feel more connected and devoted to their communities show a slightly greater tendency to use carpooling services (which was statistically insignificant in the previously cited study on the example of the Polish market). The financial benefits associated with it have little influence on the preference for sharing rides. Also, expecting a return of the favour in the future is of little importance for people.

3 Background: Models of Technology Acceptance and Use

3.1 Technology Acceptance Model – TAM

The Technology Acceptance Model (TAM) developed by Davis (1989) is one of the most important theories explaining the conditions for using technology. According to Davis, the behaviour of an individual using computer technologies is directly determined by *Behavioural Intension to Use*, which is explained by *Perceived Usefulness* and *Perceived Ease of Use*. The intention is defined as the *Attitude Towards Using* a technological innovation and its *Perceived Usefulness* for the user. Perceived usefulness is the user's assessment of whether a technology, product or service is needed for them and will enhance their job performance. The perceived ease-of-use can act as a barrier to the ultimate long-term exploitation of the new technology. Even if a technological innovation is perceived as useful, but at the same time very difficult and unintuitive, it may not be adopted by the user (Davis, 1989). Perceived usability and ease-of-use are also influenced by external factors such as technical documentation, previous training and assistance from other users or consultants. The TAM model is shown in Figure 1.

In the extended version of TAM 2, Venkatesh and Davis (2000) expanded the model with several additional factors that may potentially determine the effective use of the system. The social factors

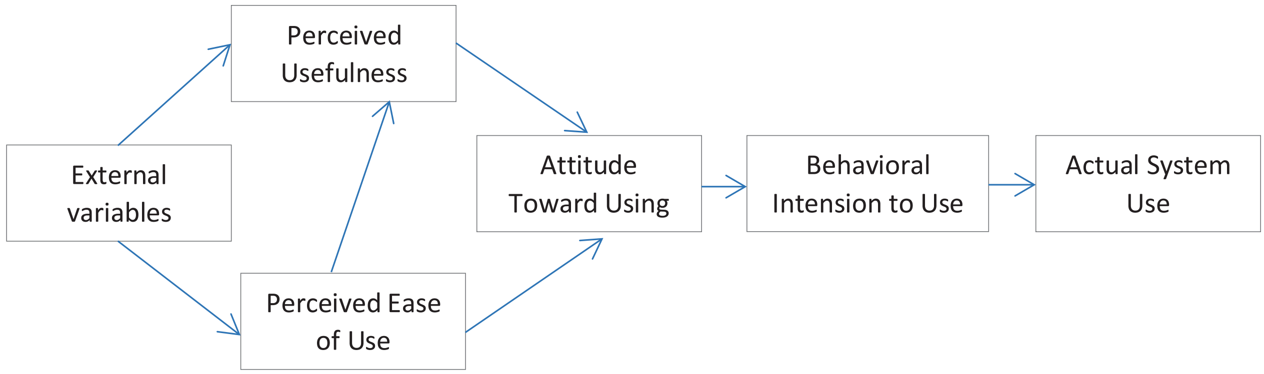

Fig. 1. Technology acceptance model (TAM). *Source*: (Davis, Bagozzi, & Warshaw, 1989).

include: *Subjective Norms*, *Voluntariness* and *Perception*. Subjective norms define an individual's perception of whether important people (family, friends and friends) believe that they should act in a certain way (e.g. use a technological innovation) (Fishbein & Ajzen, 1975). In other words, an individual's choice may be influenced by other people, their views on a given topic, or their general attitude to an issue. According to the originators of the model, voluntary decision-making is also potentially important in terms of acceptance of new technologies. *Image* – if the use of a new technology enhances the user's social status in their social group, it will also play an important role (Moore & Benbasat, 1991). The image impacts the user-perceived usefulness, which, according to the authors, is also affected by *Job Relevance*. It is understood as an individual's evaluation of the usefulness or appropriateness of employing a system in their work (Venkatesh & Davis, 2000). The TAM 2 model focuses on expanding the part of TAM 1 that concerns perceived system usefulness. However, in third edition of the technology acceptance model (TAM 3), the authors defined six determinants that shape the perceived ease-of-use of an innovation (Venkatesh & Bala, 2008). The first determinant is *Computer Self-Efficacy* understood as the degree of faith in one's own ability to perform a specific task or a job using a computer. Another factor is the *Perception of External Control* defined as the level of organisational and technical support in the use of the system. TAM 3 also comprises the factors of *Computer Anxiety*, *Perceived Enjoyment*, *Playfulness* defined as '*the degree of cognitive spontaneity in interaction with a computer*' *Objective Usability factor* which is a comparison of systems based on the actual (rather than perceived) effort required to complete a task. The listed TAM 3 elements shape the perceived ease-of-use. The TAM model is often subject to additional modifications in the context of conducted research. It can be used, for example, to predict the behaviour of website users (Lederer, Maupin, Sena, & Zhuang, 2000), the motivation to use the Internet (Moon & Kim, 2001) and the acceptance of mobile m-commerce (Wu & Wang, 2005).

3.2. Unified Theory of Acceptance and Use of Technology – UTAUT

UTAUT (*Unified Theory of Acceptance and Use of Technology*) was developed after a revision and combination of eight technology acceptance models (Venkatesh, Morris, Davis, & Davis, 2003) (Figure 2).

The UTAUT model indicates the variables that effect the user's decision to use a new technology. These variables are: *Performance Expectancy*, *Effort Expectancy*, *Social Influence* and *Facilitating Conditions*. These factors influence the behavioural intention to use a given technology, while the behavioural intention affects the actual use of the technology. The strength of the influence of these variables may depend on gender, age, experience and voluntary or compulsory use. *Performance Expectancy* is the potential user's subjective perception of how much the efficiency of the work has improved by using an innovative technology. This variable is very similar to perceived usefulness in the TAM model. According to the authors, performance expectancy is the most important factor influencing the decision to use a new technology (Venkatesh et al., 2003). The next variable is *effort expectancy*. This variable measures how much difficulty is expected while using a technology, and is similar to the perceived ease-of-use in the TAM model. According to the authors of UTAUT, effort expectancy is important in elucidating the use of technology only in the initial period, but its impact

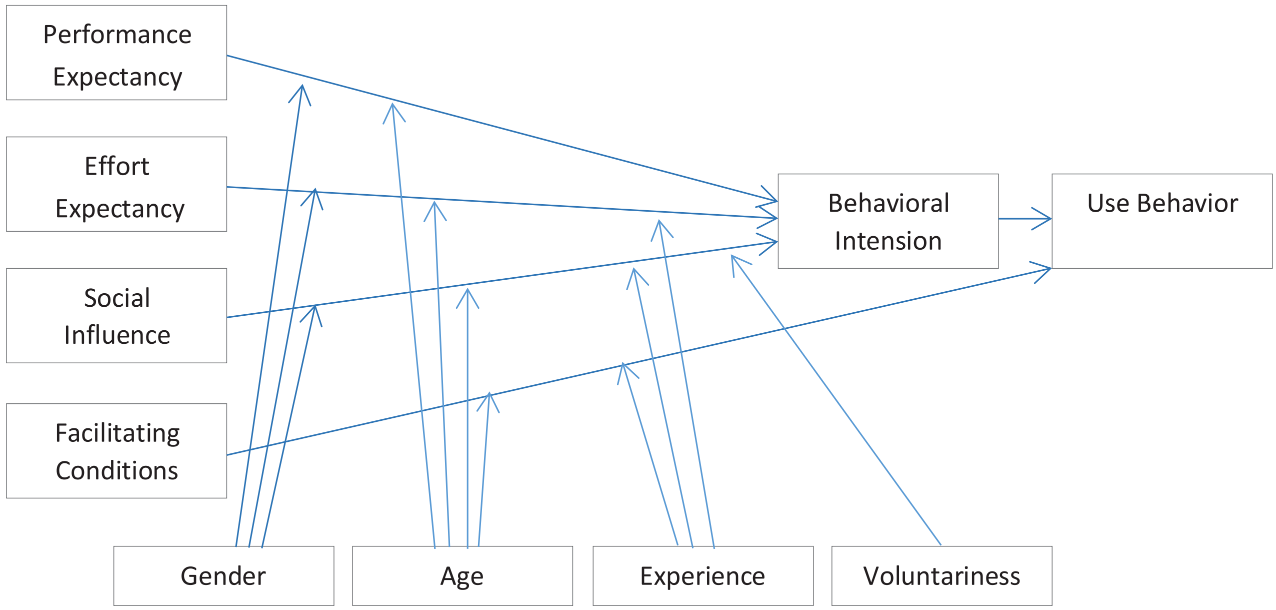

Fig. 2. The unified theory of acceptance and use of technology – UTAUT. *Source*: (Venkatesh et al., 2003).

decreases gradually. The anticipated difficulties in applying a new technology have a stronger influence on the intention to use among women, the elderly and the less experienced at work. The *social influence* variable measures the extent to which an individual feels that those important to them believe that he or she should use a new technology. The impact of social pressure on behavioural intention is larger in the case of women, the elderly, people mandated to use a given technology, and people with little work experience. The power of social influence is highest in the initial period of a person's contact with the new technology.

Facilitating circumstances refer to a person's subjective feeling that there is an organisational and technical infrastructure that supports the use of a technology. However, we have not observed the impact of this subjective perception on behavioural intention in our research. This effect is assumed to be contained in the variable effort expectancy.

In 2012, the UTAUT model was expanded by other factors: *hedonistic motivation*, *price value*, and *habit*. The first one defines the fun or the pleasure of using technologies that play an important role in determining the acceptability and use of innovation. The second factor is a predictor of the behavioural intention to use the offered technology: the higher the perceived advantages of using a technology in relation to its cost are, i.e. the price, the more likely a person is to use it. The last variable consists of de facto two elements. Further to the experience that had already been included in the original model, now habit was integrated into it, which can be defined as the degree to which people tend to perform activities automatically because of learning. The result was an improved model: UTAUT 2 (*Unified Theory of Acceptance and Use of Technology 2*).

According to the researchers (Venkatesh et al., 2003; Lederer et al., 2000), the explanatory power of individual theories is different and increases with the introduction of modifications to subsequent versions of the model. The development of new technologies results in the need to explain new behaviours of their recipients and to extend the existing models with new variables.

4 Research design

4.1 Hypothesis and methods

The study of the acceptance and use of ride-sharing technologies will be conducted based on the UTAUT 2 theory (Unified Theory of Acceptance and Use of Technology) (Figure 3).

The aim of the study is to answer the question regarding the factors influencing the intention of Poles to share rides with the use of innovative technologies. The research will identify significant variables that affect the willingness to use new ridesharing services.

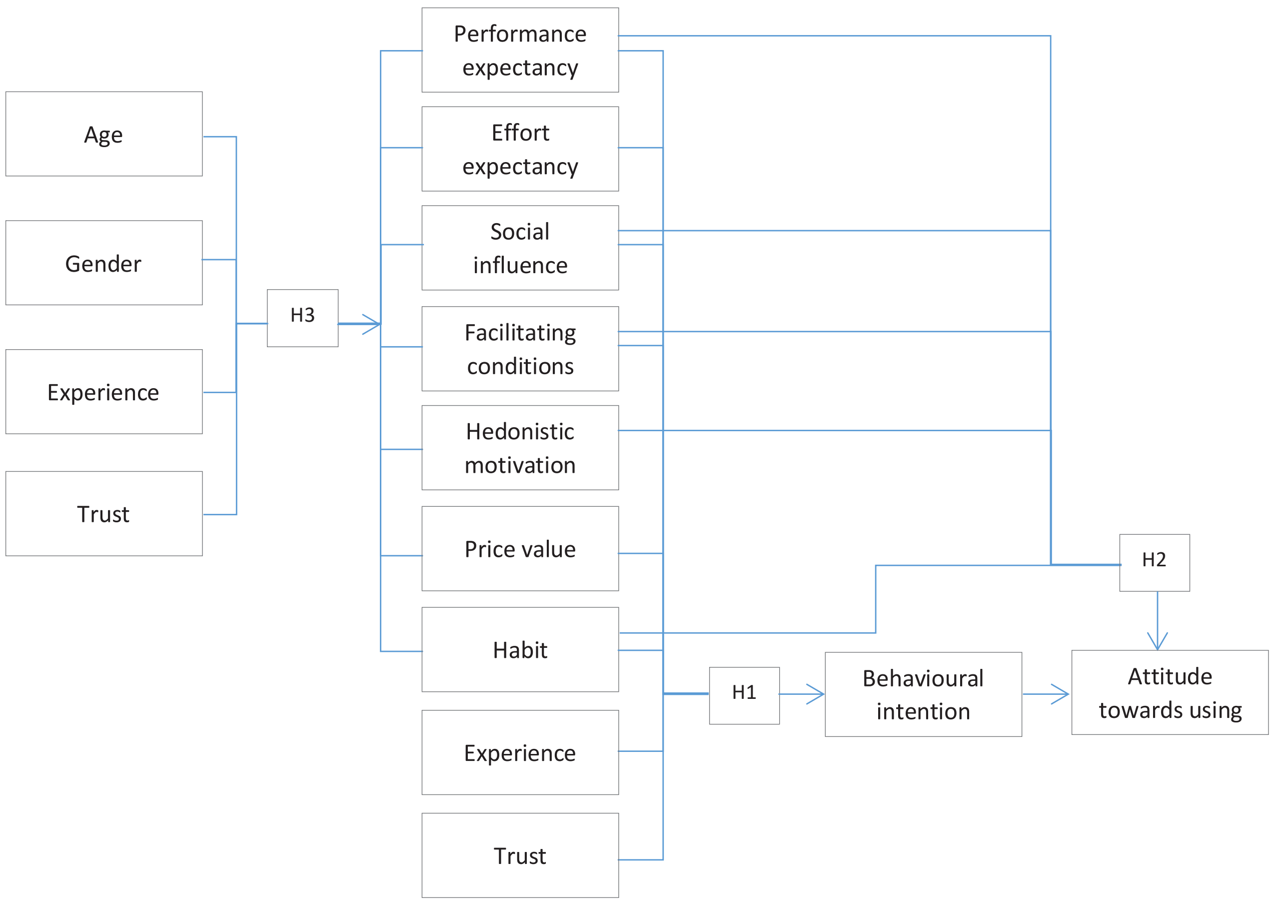

Fig. 3. Modified UTAUT 2.

The survey was conducted among respondents who live in the seven largest agglomerations (areas) in Poland.

The model includes explanatory variables such as performance expectancy, effort expectancy, social influence, facilitating conditions, hedonistic motivation, price value, habit, trust, experience and gender and age. Further, the model has two dependent variables. The first one is behavioural intention. The second dependent variable, and at the same time the key one in this model is the attitude towards using shared rides. These variables were included in many different studies (Venkatesh, Thong, & Xu, 2012) on the acceptance of technologies such as mobile applications used for health care (Slade, Williams, & Dwivedi, 2013), education management systems (Raman & Don, 2013) or driverless cars (Benleulmi & Blecker, 2017).

It is important to define how these variables are understood here. Performance expectancy determines to what extent the innovation will enhance the efficiency of moving around the city. Effort expectancy is related to the ease-of-use of the technology and the attitude towards having to walk to or from the pick-up/drop off place, because in the case of testing the acceptance of ridesharing (which is described in detail in the next subsection), the car does not pick up the person from the exact place that they indicate. Social influence is the belief that people close to us would decide to use this innovation. Facilitating conditions denote confidence in one's own skills needed to use the technology and the perceived availability of support in case of problems. Hedonistic motivation determines the pleasure of using the service. Generally, the price value is the trade-off between benefits and costs. Experience means the frequency of using carpooling, public transport, uber/taxify, passenger transport and taxis. Habit refers to the automatism of behaviour, i.e. the use of these modes of travel. In the models, these elements may be influenced by age, gender, experience and trust, which may prove important as the intuition of interpersonal interactions suggests. Trust indicates whether the user would feel safe using the service and considers it effective and trustworthy.

The UTAUT 2 theory does not include this factor in its original version. In some studies (Furuhata et al., 2013) this variable – in combination with the sense of security in interpersonal interactions and shared rides – has been found to influence the intention to use a technology, so it was decided to verify it additionally. Behavioural intention is regarded as a general attitude towards shared rides: it is also one of the two dependent variables. Attitude to using describes the willingness and intention to use ridesharing in the future in the form presented to the respondent and is the key explained variable in the model, so we will focus our attention on this factor in our study. The following research hypotheses were defined to achieve the goal of the study, which were formulated on the basis of previous research done using the UTAUT 2 theory. The hypotheses are quite complex: it would have been possible to construct more hypotheses from them, but we have decided to do so consciously so as not to create many similar ones.

Research hypotheses:

> H1: Performance expectancy, effort expectancy, social influence, facilitating conditions, hedonistic motivation, price value, habit, trust and experience all influence the intention to use the ridesharing technology
>
> H2: Performance expectancy, social influence, facilitating conditions, hedonistic motivation, and habit affect the attitude towards using the ridesharing technology
>
> H3: Age, gender, experience, and trust impact performance expectancy, effort expectancy, social influence, facilitating conditions, hedonistic motivation, price value, and habit relating to the behavioural intention to use the ridesharing technology.

Further we have conducted a computer-assisted Web interview (CAWI) for collecting data for the study, which was tested twice before data collection. Moreover, we have carried out the following procedures to verify the research hypotheses, using with IBM SPSS and/or Smart PLS 3 (SmartPLS, 2020):

- analysis of descriptive statistics, including measures of occurrence (number of observations), location (mean, median, mode), and variability (standard deviation);
- analysis of applicability, where the possibility of conducting a factor analysis was verified using the Kaiser-Meyer-Olkin test (KMO); the inverse correlation matrix was also analysed to further check the adequacy of the sample;
- confirmatory factor analysis using principal components analysis, where the eigenvalue 1 was used in the selection of factors;
- analysis with simple Oblimin rotation to improve the quality of factor analysis results; this method was used because the correlation of the factors was considered probable;
- reliability analysis in order to examine the measurement quality of scales using the Cronbach's alpha coefficient, the AVE (Average Variance Extracted) and collinearity analysis using the VIF statistic;
- analysis of the significance of individual elements, factors and paths between variables, which were tested using T values;
- linear regression using the Partial Least Square (PLS) method
- analysis of the quality of fit for the model using the R2 coefficient of determination, direction predicted by regression results, factor power using the f^2 coefficient and factor predictive relevance using the Stone-Geisser's Q^2 value and q^2;

The analysis process and the methods used were planned based on the studies of Basbeth (2017) and Hubona (2010).

4.2 Partial least squares method (PLS)

Partial least squares regression (PLS) is an alternative to other methods such as OLS regression, canonical correlation, or structural equation modelling of independent and dependent variables based on covariance. PLS can be used as a regression model to predict one or more variables and it can also be used to support modelling causal paths among the predictors and the predictive variables. The advantage of the partial least squares method is that it can be used with many explanatory variables, and many dependent variables. In addition, it exhibits properties such as high resistance to all types of outliers, or missing data, and at the same time it is well suited to deal with collinearity among independent variables. The main difficulty of the method is the interpretation of the loadings of independent latent variables.

This is because the properties of the distribution of estimates are unknown and the significance level is calculated using the bootstrap. After analysing the advantages and disadvantages of this method, we can conclude that PLS is a good prognostic tool. It is a less appropriate method; however, it will be used as an interpretative tool except for exploratory analysis. Further, it can become a starting point for further research on the analysed issues and technologies using more adequate interpretation methods (Garson, 2016). According to Henseler, Ringle and Sinkovics (2009), modelling pathways with this method at an early stage of theoretical analysis is recommended for testing and verifying exploratory models. The PLS method was used in all the research conducted till now e.g. for econometric growth modelling (Korkmazoglu & Kemalbay, 2012) and in a marketing study on consumer preferences (Tenenhaus, Pages, Ambroisine, & Guinot, 2005).

4.3 Data sample

The data in the study were collected using the CAWI survey published in 40 social network groups, which contained the names of cities and regions of the largest agglomerations in Poland. The questionnaire was divided into several parts, where in the first part the respondents were asked to name their city of residence so that we were able to select the appropriate group of subjects. Specifically, a specific type of ridesharing was defined for the purposes of this study, which is known as vanpooling. The respondents were asked to read the definition of ridesharing:

'Ridesharing is:

- *A type of transport service within an urban agglomeration that uses modern technologies to connect drivers and passengers with each other in real time using a mobile application for smartphones.*
- *It is a ride in a passenger car (5 seater) or a van (5–8 seater) with an medium-high or high standard (premium)*
- *The person driving the vehicle is a licensed/professional driver*
- *The driver drops off and picks up the passenger from a virtual stop (the place indicated on the map in the mobile application), which is the starting and ending point of the trip, located a short distance (from 0 to 300 m) from the current location/destination of the passenger (e.g. home, work, restaurant, shop, or school)*
- *During the ride, people travelling in the same direction can join*
- *The cost of such a trip in the city is 2 to 5 times lower than uber/taxify/passenger transport/taxis (regardless of whether someone joins the ride or not)*

To sum up: We travel by car/van almost like by a taxi and other people can join us, thanks to which the cost of the journey is 2 to 5 times lower than an individual trip. The place where the journey begins and ends may be a short distance from our current location/destination (0 to 300 m from it)'.

After the above description was presented, three verification questions were asked, two of which are related to reading comprehension, i.e. checking whether the respondent had a good understanding of what a shared ride is. One question categorised the respondents according to the agglomeration where they lived. Among all the people, 301 people expressed a desire to participate in the survey by answering this question, out of which 240 people are selected from the largest agglomerations (Warsaw, Krakow and Gdańsk).

Women constituted the vast majority of the respondents, as much as 74% of the sample, and men 26%. We are aware that the gender division should be more even; however, this is not been achieved. 66% of the respondents lived in cities with over 500,000 inhabitants, while 20% of people – in cities with between 100,000 and 500,000 inhabitants. People aged below 24 was the largest group, accounting for 38% of the sample. The second largest group were individuals aged 25 to 29 who accounted for 25% of the sample. The group of people aged 30–34 comprised 15% of the sample. 69% of the respondents had higher education, 15% had incomplete higher education, 14% had secondary education and 2% of the respondents had vocational education. The characteristics of the sample in terms of expenditure on transport and gender show that over 50% of people spend up to PLN 200 per month on transport in the city, while over 80% spend under PLN 499. Based on the median, it can be assumed that men spend slightly more on transport in the city than women, because for women the expenditure falls in the range of PLN 100–199, and for men – PLN 200-299.

Tab. 1. Descriptive statistics for factors

Factor	Mean	Median	Mode	Standard deviation
PE – Performance expectancy	4.71	5.00	5.25	1.78
EE – Effort expectancy	6.03	6.40	6.60	1.16
SI – Social influence	3.68	3.50	3.75	1.54
FC – Facilitating conditions	6.24	6.80	6.80	1.11
HM – Hedonistic Motivation	3.79	3.50	4.00	1.68
PV – Price value	5.26	5.50	6.25	1.50
E – Experience	2.79	2.50	2.17	1.40
H – Habit	3.14	2.87	3.27	1.69
T – Trust	4.54	4.92	5.00	1.35
BI – Behavioural intention	5.15	5.50	5.75	1.65
BU – Attitude towards using	3.78	4.00	4.40	1.81

5 Research results

5.1 The process of testing the theoretical model of the modified UTAUT 2 theory

The conceptual model of the study includes 64 questions that allowed us to measure 11 factors on the 7-point Likert scale. Table 1 presents statistics for each factor. Based on the median, it can be concluded that the respondents rather agreed with the statements about the efficiency of the technology, as the score was 5 – I rather agree. At the same time, they expressed confidence in the ease-of-use of the service, here the median is 6.4, so it's a value between 6 – I agree – and 7 – I strongly agree. The median of 3.5 for the social influence variable suggests centralisation and uncertainty about the social impact on the respondents' decisions. This can be explained by the fact that the respondents could have difficulties in judging the influence of other people on using a technology because they probably were not in a position to think of it as it is not available in Poland. Facilitating conditions had a median of 6.8, so the respondents are confident about their knowledge of how to use the phone and the application. Moreover, we have again observed a tendency towards centralised uncertainty for hedonistic motivation since the median here was 3.5. Again, this value is probably a reflection of the fact that the respondents most likely did not have the opportunity to use a similar service, so they were not able to choose any side. The median price value at the level of 5.5 reveals that the respondents tend to agree that ridesharing is profitable. The median for experience is 2.5, which demonstrates that the studied means of transport were rarely used. However, this question related to many different means of transport may have distorted the overall score for this factor. Trust tends to be slightly uncertain, but strongly oriented towards the I rather agree answer, with a median of 4.92. The possible uncertainty can again be justified by the lack of a similar system on the Polish market. The median of behavioural intention indicates that the respondents agree that sharing rides is the right direction. The median had a value of 5.5, which means that it fell between the answers I rather agree and I agree. Attitude to using exhibited a central tendency with a median of 4.

In the following sections, each question will be formatted in the X_YZ arrangement, where X is the number of the factor (one of eleven), Y is the abbreviation of the factor and Z is the number of the factor element. For example, 1_PE2 means: 1 is the first factor, PE is the abbreviation of this factor (*performance expectancy*), 2 is the number of the question relating to this factor.

At the beginning of the actual analysis using the Kaiser-Mayer-Olkin (KMO) statistics, we checked whether the collected data was suitable for factor analysis. The result at the level of 0.888 is higher than 0.8 which is satisfactory and it means that the sample is adequate. Then the individual elements were verified using the inverse correlation matrix. Based on the measure of the sampling adequacy, it was checked

Tab. 2. Cronbach's alpha coefficient (AC) results

Factor	1_PE	2_EE	4_FC	5_HM	6_PV	7_E	8_H	9_T	10_BI	11_BU
AC	0.906	0.848	0.574	0.93	0.749	0.139	0.758	0.889	0.899	0.966

Tab. 3. Final results of Cronbach's alpha and AVE

Factor	Cronbach's alpha	Average variance extracted (AVE)
BI	0.900	0.832
BU	0.966	0.882
EE	0.864	0.710
H	0.815	0.548
HM	0.930	0.743
PE	0.906	0.782
PV	0.791	0.702
Sex	1.000	1.000
SI	1.000	1.000
T	0.895	0.708
Age	1.000	1.000

whether all elements had values higher than 0.5. Two items (7_E7 and 8_H5) did not meet this criterion, so they were excluded from further analysis. After we eliminated them, the KMO statistics improved and amounted to 0.894, so the score was again higher than 0.8, meaning that the adequacy of the sample was acceptable. Principal component analysis was carried out in the next stage, using the criterion of eigenvalue higher than 1 for selection. We adopted the simple Oblimin rotation method in the rotation analysis because the correlation of the factors was considered probable. The total explained variance assuming an eigenvalue higher than 1 for 14 components explains 73.98% of the variance. At a later stage, using the model matrix on the basis of 14 components, we investigated whether they were correlated with more than one element. The value of 0.3 was adopted as the cut-off point, so when this value was greater for one of the factors, it was removed. This analysis was performed in stages, by eliminating factors that did not meet the cut-off criterion and checking the K-M-O statistics after each stage. As a result, the number of components with an eigenvalue greater than 1 decreased to 11, which explains 73.56% of the variability. At this stage, we found no more elements at the level of the factor loading criterion of 0.3 that should be excluded from the analysis. Further, while drawing conclusions from the analysis, the measuring accuracy of the scales used was verified with the Cronbach's alpha coefficient. The verification was performed for each of the 11 factors separately. Cronbach's alpha coefficients for each factor are presented in Table 2. The 3_SI factor could not be verified using the Cronbach's alpha coefficient. During the factor analysis, the building blocks of this factor were removed, leaving only one variable. It will be verified at a later stage of the analysis.

Further, to examine the variables more closely, the elements that make up the factors (explanatory variables) were verified with the Cronbach's alpha method. At this stage, convergent validity was also estimated using the AVE (Average Variance Extracted). This coefficient can be positively verified when all variables exceeded the value of 0.5. As it turned out, the factors tested in this study yielded AVE >0.5. The results of convergent validity (AVE) and of the measure of scale reliability (Cronbach's alpha) are presented in Table 3.

Further, we examined whether the model has a collinearity problem between the variables., The VIF statistic was used for this purpose and the cut-off threshold was adopted at 5; the variables that generated defined collinearity were removed from the model.

Apart from the above, the significance of the paths between the various factors had to be verified. The bootstrap method which assesses the distribution of estimation errors was used to estimate the parameters. We used a tool dedicated for this method in the SmartPLS software. When verifying significance in the further sections of the study, we followed the procedures of the methodology presented with the software. As the significance level of T-test is 0.05, significance is achieved when the T statistic (T value) is higher than 1.96 (Garson, 2016, p. 97). All the paths whose T statistic was lower than 1.96 were successively eliminated from the model so that only the significant ones to remain. So, only the paths with all T values higher than 1.96, and accepted at the level of 5% significance level, were obtained. The final results of this elimination are presented in Table 4.

Tab. 4. T statistics for the paths of the model of technology acceptance and use after the verification of the significance

Paths	Standard error	T statistics	P value
BI -> BU	0.054	8.259	0.000
EE -> BI	0.040	2.149	0.033
H -> BI	0.044	2.564	0.011
H -> BU	0.047	3.273	0.001
HM -> BU	0.057	4.016	0.000
PE -> BI	0.044	6.242	0.000
PE -> BU	0.060	2.409	0.017
PV -> BI	0.046	6.679	0.000
Gender -> HM	0.056	2.948	0.004
Gender -> PE	0.055	3.118	0.002
Gender -> PV	0.069	2.099	0.037
T -> BI	0.051	5.714	0.000
T -> EE	0.073	6.696	0.000
T -> H	0.053	7.016	0.000
T -> HM	0.053	9.717	0.000
T -> PE	0.059	7.670	0.000
T -> PV	0.054	8.099	0.000

5.2 The results of testing the theoretical model of the modified UTAUT 2 theory

This section of the article presents a statistically significant system of variables obtained in the process of analysing the collected data and modelling paths in accordance with the modified UTAUT 2 theory using the PLS method. The results show which variables assumed on the basis of this theory are statistically significant for acceptance and intention to use ridesharing technologies in Polish society. First, the T statistics and P-values of the paths which remained in the model as well as their standard errors are shown. All the paths in Table 4 are higher than 1.96, so they are statistically significant at the level of 5%.

At this stage, the statistical significance of the elements that make up the explanatory variables was also verified again. Here, too, the 5% significance threshold was adopted. All elements yielded a T statistic higher than 1.96, so they are statistically significant. The explanation of variance was higher than 70%, which is considered satisfactory. Based on the analyses, the proposed theoretical model of the modified UTAUT 2 theory for the acceptance of the use of ridesharing technologies was free of variables that turned out to be irrelevant or otherwise negatively could have affected the results (Figure 4).

Once the significance and the structure of the model are verified, it is necessary to check the changing values of the coefficient of determination, which will determine the obtained quality of fit for the model. Looking at R^2 from Table 5, we observe that 64.1% of the variability of Intention to Use (BI) was explained by the combined variability of all explanatory variables. As a result, 65.0% of the variability of Attitude to using (the intention to use the proposed ridesharing innovation – BU) was explained by the total variability of all explanatory variables. We consider this value as satisfactory.

Based on the results of the study presented in Table 5, we can verify the first hypothesis (H1) and conclude that effort expectancy, performance expectancy, price value, habit and trust affect the intention to use ridesharing, because the T statistics for these paths are higher than 1.96. These factors were also found to be significant in many studies on other technologies (Indrawati & Riyadi, 2016). However, we cannot conclude that social influence and hedonistic motivation influence the intention to use, as they were eliminated from the model during the analysis, because the T-path statistic was lower than the required value. The value of Cronbach's alpha for facilitating conditions was found to be lower than 0.7. Unfortunately, the study was not positively verified at the level of the Cronbach's alpha coefficient analysis; as the score for this factor was lower than 0.7, so we cannot consider it significant. This factor is quite intriguing due to the very low alpha values. In the future, one should focus on the method of collecting data. Perhaps the number of means of transport included in the questions for this factor was too large or the scale was inadequate.

Based on the results presented in Table 5, we can also verify the second hypothesis (H2). As the T statistic is higher than 1.96 and so the influence of factors is apparent. Now we can conclude that performance expectancy, hedonic motivation and habit influence the attitude in using the technology. Social influence and facilitating conditions do not have such an effect, as they were rejected during the verification of the model. The former variable was excluded due to T statistic being lower than the cut-off point, and the second one due to Cronbach's alpha being lower than 0.7.

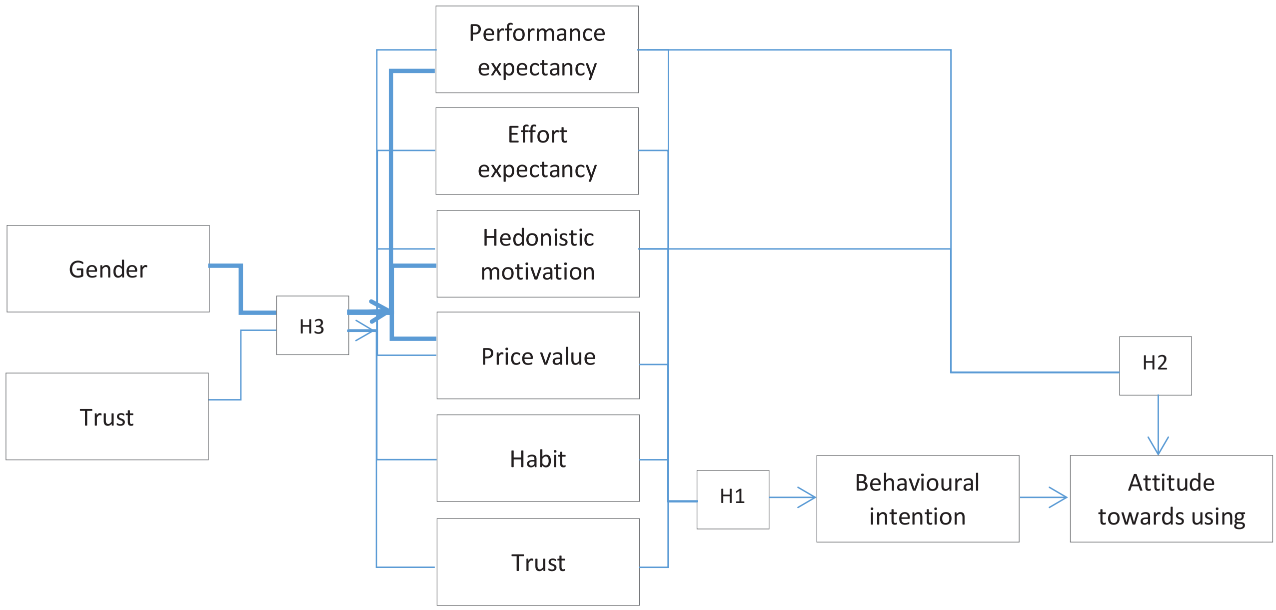

Fig. 4. Modified UTAUT 2 theory – the revised model of acceptance and use of ridesharing technologies.

Tab. 5. The R^2 factor and Paired R^2

Factor	R^2	Matched R^2
BI – Behavioural intention	0.641	0.633
BU – Attitude towards using	0.650	0.644

Hypothesis 3 (H3) was only partially positively verified similar to the previous two. The study had no chance of testing the affecting variables in the hypotheses, as it did not meet the Cronbach's alpha criterion, so we consider this part of the hypothesis as unsubstantiated (similarly to the first hypothesis). Social influence and facilitating conditions were also excluded from the model. The first factor had the T-path statistic lower than 1.96, and the second one did not meet the Cronbach's alpha criterion, as the value is lower than 0.7. Therefore, the hypothesis about the influence of age, gender, experience and trust on these factors has been rejected. The part of the hypothesis concerning the influence of experience and age on the examined factors has not been confirmed and so these were also eliminated from the model. The first one was removed due to the Cronbach's alpha being lower than 0.7, and the second one for two reasons. First, the T statistic was under 1.96 for most paths, so they were excluded. Second, one pairing showed a T statistic value higher than 1.96 related to social influence, which was eliminated as the T statistic of a pathway of this factor was lower than the required value (the path of behavioural intention and intention to use). It can be confirmed on the basis of Table 4 that trust influences performance expectancy, effort expectancy, hedonistic motivation, price value and habit, because the T statistic of the paths of these factors were higher than 1.96. Based on the same table, it is possible to confirm the significant influence of gender on price value, hedonistic motivation and performance expectancy, also because the statistical values were higher than 1.96. The discussed factors were also found to be significant in many other studies on the acceptance and use of technology, which suggests the positive direction of the study (Slade et al., 2013).

5.3 Analysis of the direction, scores and predictive validity of factors

Although the main hypotheses of the above study focussed primarily on examining the significance of individual variables specified in the theoretical model of acceptance and the use of ridesharing technologies, we decided to look at additional features of these variables. Below is an analysis in that direction, which means that power and predictive relevance of those factors were eventually included in the correct model based on the modified UTAUT 2 theory.

Smart PLS software allowed us to obtain direct, indirect and global regression results. The latter

Tab. 6. The effects of the factors of the revised model of technology acceptance and use after the verification of the significance

Factor	BI	BU	EE	H	HM	PE	PV
BI		0.446					
BU							
EE	0.086	0.038					
H	0.112	0.204					
HM		0.227					
PE	0.274	0.268					
PV	0.304	0.136					
Sex	−0.092	−0.104			−0.167	−0.173	−0.145
T	0.634	0.523	0.488	0.373	0.516	0.454	0.440

are shown in Table 6. All factors and elements are standardised. As a result of the analyses, behavioural intention was recognised as important one (consent) to shared journeys and a positive trend in the development of transport, i.e. saying yes to ridesharing. We can determine that when the level of behavioural intention increased by 1, it is found that the attitude to using shared transport is increased by 0.446 based on the 7-point Likert scale. This attitude was defined as the respondent's predicted use of the technology, the willingness to use it, and a declaration that he or she would use the service. Further, when the level of effort expectancy, i.e. the ease-of-use of the application and service is increased by 1, the behavioural intention is increased by 0.086, and the intention to use it is increased by 0.038. This is a rather negligible impact. Habit was ultimately defined as the willingness to use carpooling and to use it as the main means of transport. The habit variable also encompasses habitual use of passenger transport. If the habit value increases by 1, behavioural intention will increase by 0.112 and the willingness to use the system by 0.204. Interestingly, hedonistic motivation (pleasure of use) does not directly affect the intention (and indirectly the willingness to use), but it has a direct effect on the willingness to use. This concept has not lost due to the factors affecting it throughout the analysis, so it can be safely described as the general pleasure of using a technology. If it increases by 1, the attitude to using the innovation will change by 0.227. Performance expectancy similarly retained all the elements: its increase by 1 will have a positive effect on willingness by 0.274 and on intention to use by 0.268. Price value increase by 1, i.e. a cost-effective service where the price exceeds the benefits or which allows one to save money, has a positive effect on the willingness to use by 0.304. But, it has a much less impact on the intention to use, because the value is 0.136. Male gender negatively affects the behavioural intention to use minimally by −0.092 and the attitude towards using the technology by −0.104. A similar trend has been noted in the influence of the male gender on hedonistic motivation (−0.167), performance expectancy (−0.173) and price value (−0.145). Trust has a substantial effect on the factors influencing the behavioural intention of a potential user of vanpooling and the willingness to use it. Ultimately, we have defined it as a sense of security when using the service and traveling with strangers, trust in the company providing the service, and in the proper operation of the system. Trust increase by 1 point increases behavioural intention by 0.634, and intention to use by 0.523. Trust affected not only the explained variables directly, but also the explanatory variables. Increase in trust by 1 point increases effort expectancy (the sense of ease-of-use of the application and the service) by 0.488, habit – by 0.373, hedonistic motivation (pleasure of use) – by 0.516, performance expectancy – by 0.454, and price values – by 0.440.

Table 7 shows the effects for the f^2 coefficient which tells us how strongly one factor influences another. If the value of the coefficient is lower than 0.02, it is considered to have no impact on another variable. The value between 0.02 and 0.15 is interpreted as a small impact and between 0.15 and 0.35 – as a medium impact. If the f^2 factor is higher than 0.35, it means that it strongly influences the given variable. The outcomes show that trust has a medium effect on effort expectancy, since f^2 is 0.313 so over 0.15. On the other hand, it is close to 0.35, so one may be tempted to interpret it as a medium effect. Trust affects

Tab. 7. The f^2 coefficient

Factor	BI	BU	EE	H	HM	PE	PV
BI		**0.293**					
BU							
EE	0.015						
H	0.025	0.047					
HM		0.084					
PE	0.127	0.031					
PV	**0.173**						
Sex					0.039	0.039	0.027
T	0.145		**0.313**	**0.162**	**0.374**	**0.267**	**0.244**

Tab. 8. Stone-Geisser's Q^2 value and q^2

Factor	Q^2	q^2
BI	0.494	0.976
BU	0.531	1.132
EE	0.158	0.188
H	0.058	0.062
HM	0.195	0.242
PE	0.169	0.203
PV	0.132	0.152

hedonistic motivation to a higher degree: as f^2 is 0.374 and is higher than 0.35, its impact is very large. It has a medium impact on effort expectancy; with f^2 value is 0.267, which is more than 0.15 but less than 0.35. It has a similar effect on price value for which the coefficient is 0.244 and falls within the same range. Trust has a moderate (moderate-weak) effect on habit with the coefficient value of 0.162. After rounding to 2 decimal places, it has a weak (medium-weak) effect on behavioural intention, with a value of 0.145 (after rounding – of 0.15). Price value influences behavioural intention slightly more, but is still moderate (moderately weak) as the value is 0.173. Behavioural intention moderately (moderately strongly) affects attitude to using, with f^2 at the level of 0.293. Effort expectancy does not affect intention, as the coefficient is 0.015, which is less than 0.02. Other statistics were found to have a small impact on individual variables. Only the influence of performance expectancy on behavioural intention is slightly different, with the value of 0.127, so close to the 0.15 limit.

Finally, we calculated Stone-Geisser's Q^2 value (Table 8) to determine the predictive relevance of variables. When the value is higher than 0, the model is considered to have predictive validity. In our analysis, all the factors are higher than 0 (except for gender and trust which were not explained by other factors) and so they are predictively valid. Additionally, the same table includes the q^2 coefficient which defines the importance of each factor in explaining the dependent variables. The evaluation criteria are the same as for the f^2coefficient. For behavioural intention, q^2 is 0.98, which is considerably more than 0.35 and so the exogenous variables exhibit a very high predictive significance of attitude to using. Effort expectancy has a value of 0.19, hedonistic motivation has 0.24, effort expectancy has 0.2, and price value has 0.15. These values are higher than or equal to 0.15 and lower than 0.35, which indicates medium significance in explaining the dependent variable. Habit turned out to be of less importance, with the q^2 value of 0.06, but still above the minimum threshold of 0.02, so its impact is defined as weak.

6 Conclusions

This article addresses the issue of ridesharing which has been hitherto unexplored in Poland. The study is original because it examines the factors that influence the acceptance of ridesharing technologies and it expands the UTAUT 2 model with the trust factor. The results presented in this paper can be the basis and inspiration for further research on the acceptance of ridesharing technologies to be carried out among various communities. We have determined the factors that affect the acceptance of ridesharing technologies based on a specific type of transport, i.e. dynamic vanpooling on demand. We have employed the UTAUT 2 theory which we have appropriately modified in the context of the studied issues. The inspiration for the research was the trends observed in the development of transport in Poland and around the world in recent years. During the early conceptual work on the study, we broadly reviewed the industry press, but the main basis for modifying the UTAUT 2 model was based on scientific publications and research on collaborative economics, ridesharing, as well as the acceptance and use of various technologies. The theoretical model of the modified UTAUT 2 theory presented in the paper is a very complex conceptual model, which was verified and limited to significant variables, thus leading to the creation of a proper model. In the model that we have created, 63.3% of the variability of the dependent variable was explained by the total variability of all explanatory variables. The reason for this was an explained variable called attitude to using, i.e. the intention to use the ridesharing technology that was proposed in the questionnaire.

Adding a new variable (trust) turned out to be justified, because this factor proved to be significant both for the influence on behavioural intention and other factors included in the final model. This may prove its great importance in the entire process of acceptance and use of ridesharing services, which is not only consistent with research, but also intuitively true. A significant effect of trust on the acceptance of technology by Poles seems intuitively defensible since they are not the most trusting nation in the world. Each factor in the model is affected to a varying degree by trust, but its importance in the analysis of the findings is clear. A large effect of trust on hedonistic motivation and a moderate effect on effort expectancy are visible. It also moderately influences performance expectancy, price value and habit.

The technology acceptance study presented in this paper has revealed that not all factors proposed in the UTAUT 2 theory are important in Polish conditions in the context of ridesharing technologies. At the same time, our research has confirmed that relying on the results of research carried out in communities other than Polish may be misleading. In further research on the acceptance and use of technology, it is better to considering a method of collecting data in which data relating to experience are included. Further, our study has many number of questions related to this variable which could have been too extensive and it might have influenced the results.

The concept of shared mobility has becoming very popular and so far only very few literatures are available on Poland. Our findings can certainly be a starting point for further research. The practical implications of our research are that we have learned the factors influencing the acceptance of ridesharing technologies in Poland. The theoretical implications arise from the extension of the UTAUT 2 model to include the trust factor. Moreover, to the best of our knowledge, the methodological approach using PLS and using models of acceptance and use of technology simultaneously can be considered innovative one to Polish research.

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