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Digital transformation as a process of using digital technologies for monitoring and designing the user experience

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Abstract - **Digitization made possible businesses to monitor consumer habits to adjust their business activities to increase sales and competitiveness of their company. The focus of this research is the influence of age and gender on the transfer of personal vehicle ownership in the Republic of Croatia in 2019 and the representation of brands in these transfers. The first part of the paper discusses the theoretical aspects of digital business transformation and the possibility of using digital technologies in monitoring consumer behavior and improving customer experience. The central part of the paper presents the results of the research. The results show that the transfer of personal vehicles is mostly made by men and by age group 30 to 39 years. In total, the most represented brand in the transfer is Volkswagen, both for men and women. In the concluding part of the paper, the key research results are summarized, which companies dealing with motor vehicle transfer can use to improve the digital transformation of their companies by designing improved customer experience of their users.**

Keywords – ***consumer behavior, consumption, digitization, property transfer, personal vehicles***

I. INTRODUCTION

In the digital age, business processes and customer experience should be reimagined. Customers and how organizations engage with their customers are in the center of any successful sales, marketing, and market requirements. Recording a business on physical document papers is no longer sustainable. With mass computer use, digitalization established simpler and more efficient ways of working. But mostly, it wasn't about changing the ways how to do business or create new ones, but to offer faster and easier the same customer services as before. As digital technology started to evolve, the new ways of doing things and business became possible. With this potential of new technologies started also a reshaping of companies' approach to customers. Customers' service through advertising, marketing, and sales offerings began to adapt to customers' preferences. These actions from possibilities became a necessity, and the digital transformation was made possible.

II. DIGITAL TRANSFORMATION

Process of using digital technologies to create new — or modify existing — business processes, culture, and customer experiences to meet changing business and market requirements are called digital transformation[1].

In the process of digital transformation, technology enables users to search for what they want, whenever and however they want. The development of new technologies, software, and applications has enabled organizations to connect with customers at various levels - from purchasing information, decision-making assistance, and the purchasing process to the exchange of satisfaction information. Therefore, digital transformation also means a change in all forms of business and processes in which employees of the organization interact with its customers[2].

The digital transformation process made companies take a step back and revise everything they do, from internal systems to customer interaction, both online and in person. The old model was to wait for customers to find and come to you, whether in person or by calling. But in the contemporary digital environment, progressive companies embrace the advantages of new technologies. Digital transformation in action is to extend service offerings of the company by meeting customers on their platforms of choice[1].

A. Digital transformation in EU

As the European Commission highlights digital transformation in every organization is individual, so the development path of each organization is different. Significantly, the digital transformation of business and society has a huge growth potential, which is recognized by the European Commission as a potential for the whole of Europe.

Therefore, the European Commission's comprehensive response to the complexity of the digital transformation process is the Digital Europe program, a central element of the 2021-2027 Multiannual Financial Framework (MFF) proposal. The aim is to provide a spending instrument tailored to the operational requirements for digital capacity building[2].

The five priority areas within the Digital Europe Program for 2021-2027 are:

1. *supercomputing*
2. *artificial intelligence*
3. *cybersecurity and trust*
4. *advanced digital skills*
5. *ensuring the widespread use of digital technologies across the economy and society*[3].

B. *Digital transformation in the Republic of Croatia*

The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on Europe's digital performance and tracks the progress of EU Member States in digital competitiveness. The five dimensions of the DESI are:

1. *Connectivity – fixed broadband, mobile broadband, fast and ultrafast broadband and prices;*
2. *Human capital – internet user skills and advanced skills;*
3. *Use of the Internet – citizens' use of internet services and online transactions;*
4. *Integration of digital technology – business digitization and e-commerce;*
5. *Digital public services – e-Government and e-health*[4].

Digital Economy and Society Index (DESI), ranking for 2019, set up Croatia in 21st place out of 29 EU member states as a country with low scores on the index, as shown in Chart 1[4].

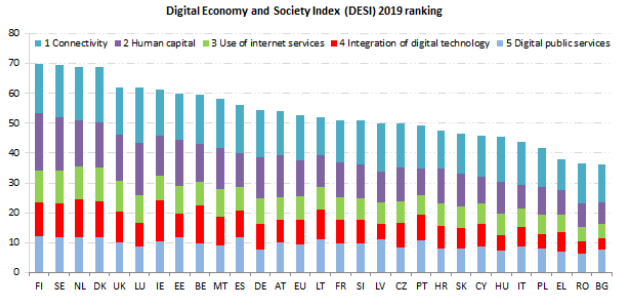

Chart 1. Digital Economy and Society Index (DESI) 2019, source: European Commission.

The same analysis shows, as stated by the Representative Office of the European Commission in Croatia[2], that Croatia has made progress in the categories of internet use and digital public services. Croatians are among the largest readers of online news in the EU, and Croatian companies are taking advantage of social media, Big Data technology, and e-commerce. However, despite some progress, Croatia has generally not made significant improvements in the area of internet connectivity compared to 2018 and has remained at the bottom of the scale, compared to the other Member States, and every fifth citizen of Croatia still do not use the Internet at all. In the category of digital transformation, ie integration of digital technology within companies, Croatia ranks 18th among EU member states, and in the category of digitalization of public services Croatia ranks 22nd among 28 EU member states, with an average lower than the EU average.

C. *Digitization of economic sectors*

Integration of Digital Technology, as represented in DESI 2019, regarding the digitization of economic sectors is progressing at a different pace, according to their own specific needs and starting points[4]. For example, in the trade of motor vehicles and motorcycles sector around 25 % percent of the enterprises have a high or very high Digital Intensity Index (DII).

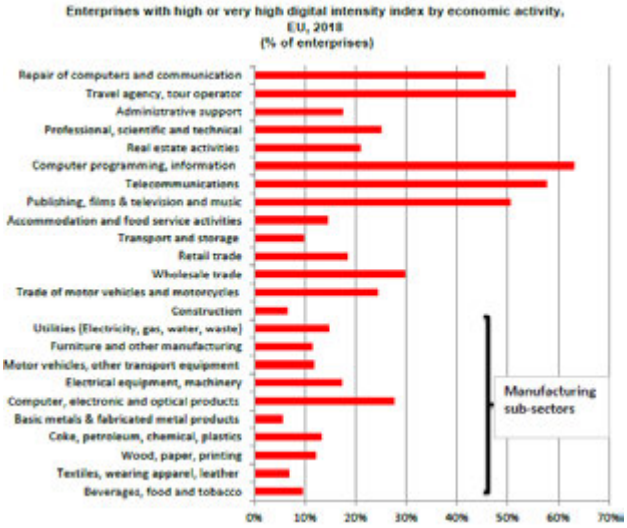

Chart 2. Enterprises with high and very high Digital Intensity Index by economic activity, EU, 2018 (% of enterprises), source: European Commission.

III. CONSUMER BEHAVIOR

The consumer behavior study examines how emotions, attitudes, and preferences of consumers affect buying behavior. Elements of consumer behavior are the subject of study in many scientific disciplines such as psychology, sociology, anthropology, marketing, and especially behavioral economics. Research has shown that purchasing decisions and consumption activities are not so easy to predict.

Customer relationship management (CRM) databases are an asset that helps to manage the company's interaction with current and potential customers. CRM technology provides companies to collect and manage large customer data and then carry out strategies based on that information. Data collected through CRM programs can help companies to solve problems from initial targeting, generating more reliable sales forecasts, increasing customer support effectiveness, increasing sales, improving customer retention to design effective customer service programs[5].

"Customers have always had a relationship with brands, but sophisticated tools for analyzing customer data are finally allowing marketing organizations to personalize and manage those relationships"[6]. Once the customer's relationships with the brand are profiled, advanced strategic goals can be created based on customers' expectations. If a brand meets those expectations, customers will respond by becoming passionate about it, but any failure to meet the expectations will be interpreted as a violation of the relationship and the relationship will be undermined[6].

A. *Consumer habits of individuals when buying personal motor vehicles*

Looking through the context of personal car ownership, the transfer of ownership between two stakeholders can be

driven by different needs. Most of the participants who find themselves in the ownership transfer process are satisfying to own needs to buy or sell the vehicle. Sometimes this need is triggered by the desire to give someone their vehicle as a gift. When it comes to personal car ownership, a common reason for property transfer is the age of the vehicle. The reason for such a decision is in fact that older the vehicle, the easier it is to transfer as its property value falls. For new vehicles that are still under warranty, this transfer is less frequent.

Considering that new vehicles always come with a higher price than used cars, it is expected that the owner will want to keep ownership until he can return investment. It can be concluded that persons who will buy used cars have lower expectations from the used vehicle then it would have from new, due to the fact vehicle will most likely have an outdated warranty and its no longer serviced in the official car repair shop. All things consider used cars shift ownership more often then used cars. Fact that new cars have lower servicing costs is also affecting the need for ownership transfer.

B. *The Automobile Consumer Studies*

Some previous research shows that demographic factors, such as age or generational affiliation and gender can have a great impact on consumer's behavior in buying vehicles for personal use.

In 2015, Deloitte fielded a survey in 19 countries to explore consumers'mobility choices and transportation decisions. In total, more than 23,000 individuals representing a broad range of cross-generational— Baby Boomers, Generation X, and Generation Y—automotive consumers responded to the survey. According to generational views, individuals today have many transportation options and increase their transportation decisions are differing across Generation Y. It is interesting to notice that, for example, 64 % of Generation Y consumers love their car, but they are 3 times more likely to abandon their vehicles if cost increase than other generations[7].

The worldwide research of the influence of gender on travel and transportation systems still show that women are somewhat less likely than men to hold drivers' licenses and to own cars, but differences between men and women in vehicle ownership and miles driven are far greater among older age cohorts and are diminishing over time as younger cohorts mature and become the majority of the population. But despite the lessening of those differences over time, some differences remain very persistent over time. For example, women continue to work closer to home than men, are more likely to use public transit for work trips than men[8].

IV. THE RESEARCH METHODOLOGY

A. *The Research Purpose /the Research Goals*

The general objective of this research was to examine the impact of individual demographic variables gender and age and variable brand on the ownership transfer of personal vehicles, which reflect the pattern of customer behavior on the purchase of personal car ownership, in terms:

- ***The personal vehicle*** belongs to a category whose maximum permissible mass does not exceed 3,500 kg and which are designed and constructed for the carriage of not more than 8 passengers, not counting the driver's seat. Personal vehicles may be combined with a trailer with a maximum authorized mass not exceeding 750 kg.
- ***Ownership transfer*** is a process between two individuals which is conducted by the station for technical inspection within the registration area according to the residence or the owner. After the process is done, the new owner of the vehicle can fully legally control the vehicle as is own property. In a current context, ownership transfer is viewed as a used car selling record.

Main research questions are defined as follows:

1. *Does gender affect consumer behavior regarding vehicle transfers?*
2. *Does age affect consumer behavior regarding vehicle transfers?*
3. *Does the brand affect consumer behavior regarding vehicle transfers?*

B. *The Research Sample and Method*

Data were collected from vehicle technical inspection stations in the Republic of Croatia in 2019, transferred to the databases of the Ministry of the Interior of the Republic of Croatia (abbreviated in Croatian as MUP). For data processing and cleaning (wrong entries, incomplete entries) software solutions were used based on the tools developed in the agency PROMOCIJA plus d.o.o. (Marketing Analysis and Statistics of Croatian Car Market).

For this study, data has been grouped by gender, age, the brand of vehicle, and ownership transfer frequency. Processing by gender, age, and vehicle brands was done through the C# and MSSQL.

The total number of samples was 271.108 transfers, which included 181.842 males (67%) and 89.266 females (33%). The average age of males is 43.45 and for females 41.91.

C. *The Research Results*

The results of the research are presented according to the research questions, as follows:

1. *Does the gender of the vehicle affect the distribution of ownership transfers?*

Data based on 271.108 personal vehicle ownership transfers in 2019 in the Republic of Croatia show that more than two-thirds of all vehicle ownership transfers, 181.842 of them, were made by men, while less than one-third 89.266 were made by women. The distribution of ownership transfers of personal motor vehicles per gender in 2019 in Croatia in percentages is presented in Chart 3.

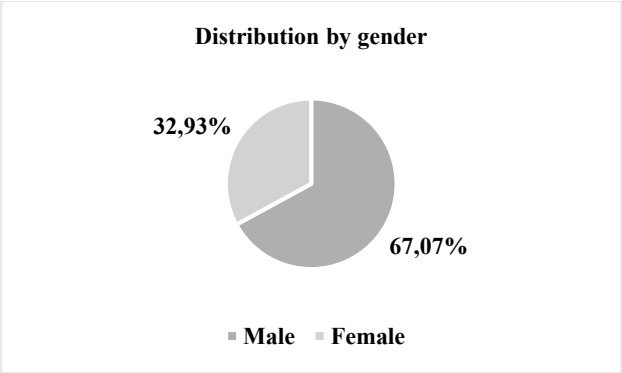

Chart 3. Distribution of ownership transfers of personal motor vehicles per gender in 2019 in Croatia; *N = 271.108.*

2. *Does age affect consumer behavior regarding vehicle transfers?*

Records of participants, for this research, are divided by age groups: 18-29 years old, 30-39 years old, 40-49 years old, 50-59 years old, 60 years, and more (60+). Data shows that:

- in the age group of 18 to 29 years, twice as many men than a woman made the transfer of personal vehicle ownership;
- in the age group of 30 to 39 years, that difference in transfer of personal vehicles ownership between men and women is somewhat smaller, as well as
- in the age group of 40 to 49, while
- in the age group of 50 to 59 years difference in transfer of personal vehicle ownership between men and women increases.
- In the age group of 60+ in the biggest difference the transfer of ownership made by men and women can be noticed; almost three-quarters personal vehicle ownership transfers are made by men.

The distribution of ownership transfers of personal motor vehicles per age group in 2019 in Croatia in percentages is presented in Table 1.

Age group	Male	Female
18-29	66,81 %	33,19 %
30-39	63,63 %	36,37 %
40-49	64,90 %	35,10 %
50-59	69,13 %	30,87 %
60+	73,15 %	26,85 %

Table 1. Distribution of ownership transfers of personal motor vehicles per gender and year in 2019 in Croatia; *N = 271.108*

3. *Does the brand affect consumer behavior regarding vehicle transfers?*

a. *The relation between gender and vehicle brand*

In the Republic of Croatia, during 2019, in a total number of all personal vehicle ownership transfer, the most represented brands of personal motor vehicles were Volkswagen, Opel, Renault, Fiat, Peugeot, Mercedes, and Citroen. In total, the top 3 the most represented brands during the transfer for males were Volkswagen, Opel, Renault, while the least represented brand was Citroen. Among women, in total, the top 3 the most represented brands in the transfer of personal motor vehicles in 2019 were Volkswagen, Renault, and Opel, while the smallest representation of the brand is Mercedes.

Gender distribution by the 8 top brand preferences in Croatia during 2019 is presented in Table 2.

Brand	Male	Female
Volkswagen	21,42 %	8,90 %
Opel	10,66 %	5,62 %
Renault	10,61 %	6,08 %
Fiat	6,35 %	3,61 %
Peugeot	6,31 %	4,06 %
Mercedes	6,12 %	2,52 %
Citroen	4,87 %	2,89 %

Table 2. Gender distribution per brand preferences in 2019 in Croatia, *N = 271.108*

b. *Relation between age and vehicle brand preference*

Regarding the relation between age and brand of personal motor vehicles in the transfer of ownership preferences, total data has shown that Volkswagen is the most represented brand for all age groups.

In the age group of 18 to 29 years, the second most represented brand is Opel and the third is Renault, as for age group 60+. In the age groups of 30 to 39, 40 to 49, and 50 to 59, the second most represented brand is Renault and third is Opel.

The selection of the top three most common brands by the age group in ownership transfers of personal motor vehicles in 2019 in Croatia is shown in Table 3.

Age	Brand	Vehicle ownership transfers
18-29	Volkswagen	54,35 %
	Opel	23,31 %
	Renault	22,34 %
30-39	Volkswagen	48,06 %
	Renault	26,89 %
	Opel	25,05 %
40-49	Volkswagen	46,39 %
	Renault	28,57 %
	Opel	25,05 %
50-59	Volkswagen	46,76 %
	Renault	26,99 %
	Opel	26,25 %
60+	Volkswagen	45,11 %
	Opel	28,29 %
	Renault	26,60 %

Table 3. Gender distribution per brand preferences, *N = 271.108*

c. The relation between age, gender and vehicle brand

Regarding the relation of all three variables *age, gender,* and *vehicle brand*, data has shown that:

- in the age group of 18 to 29 years in the Republic of Croatia, during 2019, the transfer of personal vehicle ownership was more often made by men (40.174), while women do it in twice as rare (19.962). Within the male group, the least represented a brand of the 8 included in the selection is Citroen. Within the female group, the least represented a brand of the 8 included in the selection is BMW.
- In the age group of 30 to 39 years, the transfer of personal vehicle ownership is more often made by men (40.013), while women do it in a significantly smaller number, almost twice as rare (22.872). Within the male group, the least represented a brand of the 8 included in the selection is Citroen, as for the previous age group. Within the female group, the least represented a brand of the 8 included in the selection is BMW, the same as for the previous age group od women.
- In the age group of 40 to 49, the transfer of personal vehicle ownership is more often made by men (37.258), while women make it (20.149). Within the male group, the least represented a brand of the 8 included in the selection is BMW. Within the female group, it is the same, the least represented a brand of the 8 included in the selection is also BMW, as well as for the previous age group, same as for the previous two age groups of women.
- In the age group of 50 to 59 years, the transfer of personal vehicle ownership is more often made by men (32.581), while women do it more than twice less (14.546). Within the male group, the least represented a brand of the 8 included in the selection is also BMW, the same as within the female group.
- In the age group of 60+, the transfer of personal vehicle ownership is more often made by men (33.565), while women make up barely a third of the total number (11.584). Within the male group, the least represented a brand of the 8 included in the selection is BMW, the same as within the female group.

In summary, as the results have shown, the most preferenced brand from the 8 most presented brands in personal vehicle transfer ownership in Croatia during 2019, both for men and women, for all age groups, is brand Volkswagen. The least represented brand is for men, ages 18 to 39, is Citroen, and ages from 40 to 60+ are BMW, while for women for all age groups, the least represented brand during personal vehicle ownership transfer is also BMW.

The selection of the top eight most common brand by the age group in ownership transfers of personal motor vehicles in 2019 in Croatia is presented in Table 4.

Age	Brand	Male	Female
18-29	Volkswagen	32,73 %	27,76 %
	Bmw	13,69 %	5,76 %
	Opel	12,35 %	15,35 %
	Renault	11,23 %	15,93 %
	Audi	10,99 %	6,29 %
	Peugeot	6,91 %	11,95 %
	Fiat	7,91 %	10,20 %
	Citroen	4,17 %	6,76 %
30-39	Volkswagen	29,08 %	25,34 %
	Bmw	9,81 %	6,65 %
	Opel	13,93 %	15,36 %
	Renault	14,61 %	17,12 %
	Audi	8,90 %	7,13 %
	Peugeot	8,68 %	10,80 %
	Fiat	8,17 %	9,35 %
	Citroen	6,81 %	8,23 %
40-49	Volkswagen	28,55 %	24,16 %
	Bmw	7,52 %	5,95 %
	Opel	14,48 %	14,77 %
	Renault	16,03 %	17,75 %
	Audi	7,99 %	6,79 %
	Peugeot	9,36 %	11,81 %
	Fiat	8,40 %	10,11 %
	Citroen	7,66 %	8,67 %
50-59	Volkswagen	29,84 %	24,40 %
	Bmw	5,42 %	5,09 %
	Opel	15,30 %	16,98 %
	Renault	15,67 %	17,61 %
	Audi	7,03 %	5,22 %
	Peugeot	9,59 %	11,25 %
	Fiat	9,68 %	10,49 %
	Citroen	7,47 %	8,96 %
60+	Volkswagen	26,80 %	22,34 %
	Bmw	3,31 %	3,90 %
	Opel	19,08 %	18,55 %
	Renault	17,15 %	18,37 %
	Audi	5,11 %	4,76 %
	Peugeot	9,74 %	11,57 %
	Fiat	10,40 %	11,68 %
	Citroen	8,42 %	8,84 %

Table 4. Gender distribution per age and brand preferences, *N = 271.108*

V. CONCLUSION

During the research, several valuable insights were gained. Research has shown that gender is a parameter that needs to be calculated when forecasting personal vehicle ownership transfer behavior. Both genders do not fluctuate on the same level given, and some of this can be attributed to the historical relationship of women and driving, which is present today, especially for older age groups.

Also, the preferences of certain brands of vehicles are common to all age groups, as well as for gender, and the results show a similar trend for the least preferred. That can be explained by the fact that most brands have different marketing targets. Brands tend to profile themselves within a demographic niche. But if that isn't so, more detailed research is needed.

Although, digitization has made it possible to move from keeping data in paper form to the ability to monitor data about customers and transfers that occur during the business process, for digital transformation to be fully brought to life it is necessary to research what customers want and fully adapt the company's efforts to provide the best possible user experience.

The results of this research can be used to advance the digital transformation of companies through two approaches. The first approach is to strengthen existing customer behaviors, and the second approach is to predict the behavior of existing customers, which through advertising, marketing, and other sales activities will influence the increase of customers who are currently less represented.

Business process planning following the possibilities of digital transformation is still in its early age, so companies must determine their capabilities, systematically use the benefits of digital tools, and in accordance with the knowledge gained through digital transformation tools, adapt their promotional activities to increase sales in a way that they design a user experience that will bring them the desired business results, and the users the desired user experience.

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