

*e-commerce, online purchase, TAM model, Italian university students*

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## **MEASURING PROPENSITY OF ONLINE PURCHASE BY USING THE TAM MODEL: EVIDENCE FROM ITALIAN UNIVERSITY STUDENTS**

### **Abstract**

*This study aims to investigate the dynamics of online purchasing behavior through the analysis of a sample of students from Italy. The objective is twofold: firstly, to outline a descriptive picture of the type of relationship with the web and the use of the TAM model to highlight the propensity to use electronic commerce by the analyzed sample. An interesting evidence is the prevalence of using the Internet for social activities rather than for purchases. In fact, the propensity to purchase online is still very limited and mainly concerns cultural and tourist services rather than physical products. Mobile devices are the main devices for connecting students to the Web and, consequently, the most used for purchasing online.*

### **1. INTRODUCTION**

At the end of the 20th century, after the greatest expansion of e-commerce, the initial expectations of the time have not yet been reached. This fact alone justifies the interest in studying this phenomenon, with the aim of reviewing the strategies and factors that influence online consumer behavior (Jones & Vijayasarathy, 1998; Goldsmith & Bridges, 2000; Rowley & Slack, 2001).

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If we focus on the Italian context, several academic and empirical studies show that Italian customers do not use e-commerce as frequently as customers in other European countries. Even young people seem to have scarce interest in online shopping, although they represent a segment characterized by a strong digital culture and, therefore, prone to online purchases. According to the ISTAT (Italian National Institute of Statistics), in fact, in 2018 the share of Italian web users aged 15 or over who purchased online in the 12 months preceding the interview rose to 55.9%, compared to 53.0% in 2017. Those who buy the most online are males (59.8), young people between 20 and 34 (about 70.0%) and residents in the North of Italy (60.8%). The data show a positive trend, although much less than other European countries. According to Eurostat, in fact, Italy occupies the 23rd position of 28, ahead of Greece, Croatia, Cyprus, Bulgaria and Romania.

There are several factors that determine the growth of e-commerce, such as the convenience that Internet offers the user, the possibility of buying without time constraints, and the opportunity to save money, thanks to greater comparability of offers (Mandelli & Vescovi, 2003; Prandelli & Verona, 2006; Valvi, Frangos & Grangos, 2013). Furthermore, the choice of online shopping would also depend on the ease in finding detailed information on the product of interest, interacting with the company directly and sharing the shopping experience on social networks (Verhoef, et al., 2009; Rose, et al., 2012).

However, there are also several inhibiting factors in online commerce, which could slow down growth in some geographical and social contexts. These factors concern, among others, the lack of security perception and because the product is sold online, the impossibility of carrying out an adequate pre-purchase evaluation of the product, because of its intangibility.

The implications and links between consumer psychographic characteristics and purchasing behavior are several (Dalli & Romani, 2004; Kwek, et al., 2010). Some concern the possibility and the ability to use devices, others concern the use of social media by consumers. In particular, if the user-generated contents within the social community damages the corporate brand, the commercial policies implemented by the company could lose their effectiveness (Nambisan & Watt, 2011; Cherubini & Pattuglia, 2012; Gensler, et al., 2013). Other features relate to people's attitudes towards online purchases (Novak, Hoffman & Yung, 2000), which can be withheld because of the previously mentioned inhibiting factors.

At the same time, it is interesting to note the role played by virtual communities, which are able to influence not only the outcome, but every single phase of the consumer purchase process, from the perception of the need to the final purchasing phase (Kwek, et al., 2010; Riva, 2010). Indeed, there are numerous studies that focus on analysing the role that virtual communities play in the decision-making process (Cuomo, Metallo & Tortora, 2011; Cheung & Thadani, 2012; Li, Wu & Lai, 2013; Yoo, Sanders & Moon, 2013; Cheung, Liu & Lee, 2015). The experience of other consumers has a significant impact on the brand's reputation in the minds of potential consumers; consequently, this experience is able to

decisively influence the propensity to purchase (Cova, 2002; Gensler, et al., 2013). In fact, several studies indicate that users consider social networks as a reliable source of information (Nambisan & Watt, 2011). Therefore, online shopping tends to be increasingly identified as a social experience – the so-called “social shopping” – since it is the result of the interdependence among different subjects, which share the interest for specific categories of products or services that can be purchased online (Novak, Hoffman & Yung, 2000).

The growing diffusion of global e-commerce and the number of studies carried out on the subject show how the analysis of online purchasing behavior becomes increasingly important in order to grasp its determining factors. In fact, the traditional approach studies several factors that influence the adoption of online consumer behavior, and the Technological Acceptance Model (TAM) is widely used for this purpose. The original value of this paper is to consider all the different devices to connect the Internet and, consequently, to buy online.

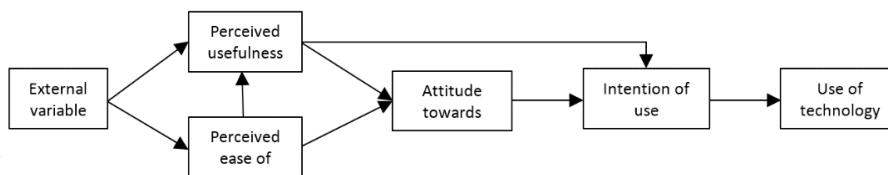
## 2. TECHNOLOGY ACCEPTANCE MODEL (TAM)

Several models have tried to explain the process of adopting innovation as an integration of traditional purchasing processes with new technologies (Muñoz, 2008).

For our purpose, we will focus on the Technology Acceptance Model (TAM) proposed by Davis in 1986, which represents an adaptation of the Theory of Reasoned Action (Ajzen & Fishbein, 1980). The TAM model seems to be one of the most widely supported in the literature (Davis, et al., 1989) and the most appropriate for the research we are carrying out.

According to this model there are three key factors that influence the acceptance of innovation (Figure 1):

- The perceived usefulness,
- The perceived ease of use,
- The attitude towards use.



**Fig. 1. Technology Acceptance Model (Davis, et al., 1989)**

Most studies confirm the positive relationship between perceived utility and attitude (Fenech & O’Cass, 2001; Chen, et al., 2002; Gentry & Calantone, 2002), which also affects behavioral intention (Agarwal & Karahanna, 2000; Liu & Wei, 2003; Pavlou, 2003; Shih, 2004; Herrero, Rodríguez del Bosque & García De Los

Salmones, 2004; Venkatesh & Bala, 2008; among others). In this regard, conclusive results of the influence of ease of use on attitude have not been obtained. However, it is true that some authors do find a positive relationship (Chen, et al., 2002; Fenech & O'Cass, 2001; Van Der Heijden, et al., 2003; Shih, 2004), although this influence can also be mediated by the perceived utility (Adams, et al., 1992; Venkatesh & Davis, 1994; Gefen, 2000). Finally, it has been stated that attitude influences the intention of use (Chen, et al., 2002; Gentry & Calantone, 2002; Van Der Heijden, et al., 2003; O'Cass & Fenech, 2003; Herrero, et al., 2004; Shih, 2004).

Over time the TAM model has evolved, so different authors have added new variables (perceived risk, confidence, ...) or even eliminated some, such as attitude.

Teo et al. (1999) argue that the acquisition of online products is mainly affected by the utility associated with the Internet and, and to a lesser extent, by its perceived ease of use. On the contrary, according to Park et al. (2004) the strongest influence on the propensity to purchase online is exercised by the ease of use and, secondarily, by the perceived utility.

Other authors (Gefen & Straub, 2000; Gefen, 2003; Pavlou, 2003) have also studied the TAM model without including the variable "attitude", and found empirical evidence to maintain the influence of perceived usefulness and ease of use over intention of use.

## **2.1. Intention of use**

The intention of use, or the acceptance of technologies by individuals, represents the dependent variable to be predicted in the TAM model. In our case, the way to measure the intention to use is through a single item that includes the intention of recommending electronic commerce to other users, adapted from the Davis model (1989).

## **2.2. Perceived usefulness**

Perceived usefulness represents the degree to which individuals believe that the use of technology will improve their productivity when making purchases (Gentry & Calantone, 2002; Liu & Wei, 2003).

Different studies justify empirically the relationship between perceived usefulness and intention of use (Davis, et al., 1989; Lee, et al., 2003; Pavlou, 2003). This means that people form the intention to use on the basis of thinking on how to improve the development of the job. For this reason, the following hypotheses are proposed:

*H1: Perceived usefulness has a positive influence on the intention of use in e-commerce.*

Normally this concept of performance is usually associated with improvements or perceived benefits in the use of technology, such as convenience or improvement of efficiency and effectiveness (Hernández, et al., 2010), cost saving, time saving or the possibility of receiving products at home (Hernández, 2011).

Hernández (2011) states that the study of the multidimensionality of the perceived utility variable has been rejected by previous studies (Chin & Todd, 1995), and it is still a greenfield issue.

In this study, perceived usefulness has a multidimensional nature and it is measured through nine items that refer to the factors that encourage the use of e-commerce by users (Table 1).

**Tab. 1. Perceived usefulness**

Items	Average (out of 5 points)
Ability to purchase without time constraints (U1)	3.17
Opportunity to have a varied choice of products (U2)	3.70
Chance to save money thanks to price comparability (U3)	3.79
Ability to have detailed product information by the seller (U4)	2.98
Possibility to read reviews/opinions from other consumers (U5)	3.46
Ability to interact directly with the seller (U6)	2.44
Ability to share purchases on social networks (U7)	1.42
Chance to save time and money by having the goods at home (U8)	3.48
Possibility to buy with more calm and awareness (U9)	3.43

### 2.3. Ease of use

Ease of use refers to the degree of difficulty perceived by users for a specific technology, as well as the propensity to use it on the basis of their abilities (Hernández, 2011). In this way, the ease of use of a given system, in terms of clarity and simplicity, allows a greater adoption of the system (Venkatesh, et al., 2003; Yu, et al., 2005; Hernández, 2011); thus, when individuals perceive that a task is easy to perform, they will maintain a more positive predisposition towards the use of that type of system (Davis, 1989). However, this influence is higher and more significant in cases of scarce experience with the technology in question (Venkatesh, et al., 2003; Yu, et al., 2005).

*H2: Ease of use has a positive influence on the intention of use in e-commerce.*

Other studies have been developed to analyze the antecedents of ease of use, among which self-efficacy has been pointed out. It has been defined in various ways: as the degree to which individuals consider themselves capable of performing tasks in using technology (Chen & Dhillon, 2003; Venkatesh & Bala, 2008),

as the belief in their ability to perform actions (Bandura, 1997) and, considering the context of e-commerce, as the beliefs that individuals have of their abilities to use computers competently (Compeau & Higgins, 1995). The influence of this variable on behavioral intention has been confirmed by several researchers (Ajzen, 1991; Eden, 1992; Godin & Kok, 1996; Bandura, 1997; Shim, et al., 2001; Huh, et al., 2009).

In our case, we measure this variable through an item which represents consumer perception with regard to the capacity to use tools on the Internet.

The relationship between perceived ease of use and perceived usefulness has also been empirically tested in electronic commerce (among others: Davis, 1989; Karahanna & Straub, 1999; Teo, et al., 1999; Agarwal & Karahanna, 2000; Van der Heijden, et al., 2003; Pavlou, 2003; Ventakesh et al., 2003; Herrero, Rodríguez del Bosque & García, 2004; Shih, 2004; Wu & Chen, 2005; Venkatesh & Bala, 2008; Ha & Stoel, 2009; Chang, 2010; Chen & Chen, 2011). It emerges that perceived ease of use is antecedent to perceived usefulness.

*H3: Ease of use has a positive influence on perceived usefulness of e-commerce.*

#### **2.4. Perceived risk**

The nature of electronic commerce justifies the existence of risk, since it is a virtual relationship (Qiu & Li, 2008). Perceived risk is defined as the consumer's perception of uncertainty and adverse consequences when performing an activity (Jarvenpaa, et al., 1999) or an online transaction (Kim, et al., 2008). Some studies have introduced it as uncertainty regarding the negative consequences or losses that could result from the use of electronic commerce (Peláez & Rodríguez, 2009). Among these negative consequences, there is one indicating that the product does not match the desired expectation.

Generally, the existence of two types of uncertainty depending on the origin is accepted (Pavlou, 2003):

- Uncertainty of behavior which derives from the conduct of the seller and includes: economic risks (like fraud), personal risks (products that are unsafe or dangerous for the buyer), risks of the seller's performance (failure to meet deadlines, return, guarantee, etc.), and privacy risks (about buyer's information).
- Uncertainty of the environment which is associated with the intrusion of external agents and includes: economic risks (such as theft of banking information) and privacy risk (such as the improper use of a buyer's private data).

Risks represent the main barrier to the adoption of electronic commerce (ONTSI, 2010) or behavioral intention (McKnight, Choudhury & Kacmar, 2002; Liu & Wei, 2003; Pavlou, 2003; Im, Kim & Han, 2008); so that the perceived risk directly influences consumer behavior (Mayer, Davis & Schoorman, 1995; Gefen, Rao & Tractinsky, 2003).

*H4: Perceived risk has a negative influence on the intention of use in e-commerce.*

Risk is also a factor related to the perceived ease of use (Liu & Wei, 2003; Pavlou, 2003; Im, Kim & Han, 2008; Shen & Chiou, 2010).

*H5: Perceived risk has a negative influence on the ease of use in e-commerce.*

In this research, the perceived risk is measured by seven items (Table 2), considered in the questionnaire as those that impede online purchase.

**Tab. 2. Perceived risk**

Items	Average (out of 5 points)
The lack of trust in payment methods (R1)	2.56
The unclear purchase termination procedures (R2)	2.82
The inability to ensure product quality with hands (R3)	3.53
The lack of confidentiality of personal information provided (R4)	2.61
The fear that the received item does not match the purchased one (R5)	3.26
The high delivery costs (R6)	2.56
The high delivery times (R7)	2.48

## 2.5. Social presence

Teo et al. (2008) add other factors to the adoption model in order to represent the reality more faithfully. Among these factors, there is social presence, that represents the perception of being inside a communication channel shared with other people (To, et al., 2008). Thus, the feeling of social presence or perception of presence favors the increase of a favorable predisposition to the adoption of the system (Hernández, 2011).

*H6: Social presence has a positive influence on the intention of use in e-commerce.*

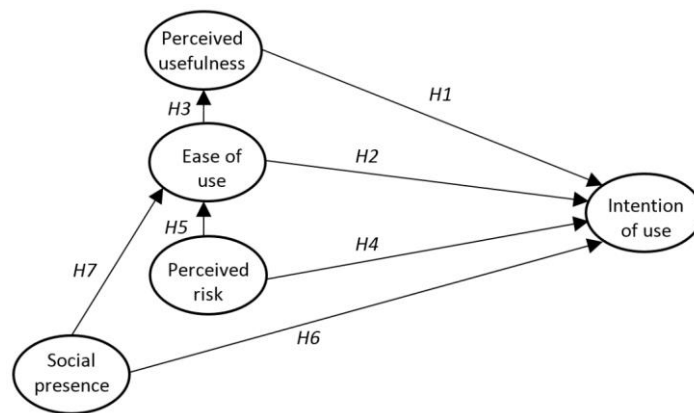
Previous studies have also investigated the influence of social presence on ease of use (Karahanna & Straub, 1999).

*H7: Social presence has a positive influence on ease of use in e-commerce.*

In our case, social presence is measured by using one item, which includes the level of activity in social networks.

## 2.6. Proposed model

As a result of this theoretical review, the following model is proposed for empirical testing (Figure 2):



**Fig. 2. Structural equation model**

## 3. METHODOLOGY

In order to achieve the objectives of this research, we developed a quantitative technique to collect primary information, by using online survey tools. The fieldwork was developed between May and June, 2016.

The questionnaire collects information about different topics, using the following block structure:

- Block 1: General information about the connection to the Internet.
- Block 2: Information about the use of the Internet to make purchases.
- Block 3: Information about the use of traditional shops to make purchases.
- Block 4: Information about the socio-demographic characteristics of the sample.

The universe is composed by university students of the School of Economics at the University of Perugia (Italy). After proposing the questionnaire to all the population (2.253 students) we collected 335 surveys, so the representativeness is 14.87%. The selection of respondents was conducted by convenience.

All the methodological information is summarized in table 3.



**Tab. 3. Technical record of the study**

<b>Universe</b>	2,253 (students in the Faculty of Economy)
<b>Sample size</b>	335 (14.87%)
<b>Sample process</b>	By convenience
<b>Technique</b>	Online survey
<b>Fieldwork</b>	May 17 – June 24, 2016

## 4. RESULTS

The structural equation model used to verify the hypotheses was estimated by the partial squared minima method, using the application SmartPLS 2.0.

The results were analysed on the basis of different techniques, according to the tool to be connected; they are presented firstly in a descriptive form and secondly through the data obtained from the structural model.

### 4.1. Descriptive analysis

#### 4.1.1. Sociodemographic variables

The analysed sample represents 14.87% of the universe (335 respondents).

**Tab. 4. Sociodemographic profile**

Variable	Characteristic	Percentage (%)
<b>Gender</b>	Male	38.51
	<b>Female</b>	<b>61.49</b>
<b>Studies</b>	<b>Degree</b>	<b>63.28</b>
	Master	36.72
<b>Employment status</b>	<b>I am full-time student</b>	<b>69.85</b>
	I work part-time/weekend	24.18
	I have a full-time job	5.97
<b>Monthly income (€)</b>	<b>Less than 500</b>	<b>77.01</b>
	501–750	14.03
	751–1000	3.28
	1001–1500	4.48
	More than 1500	1.19
<b>Region</b>	<b>Umbria</b>	<b>88.06</b>
	Others	11.94
<b>Nationality</b>	<b>Italian</b>	<b>90.45</b>
	Community (EU)	1.79
	Non–EU	7.76

61.49% are women and 63.28% are enrolled in three-year degree courses offered in the School of Economics of the University of Perugia. 69.85% of students declare that they are full-time while 24.18% have a part-time job. The disposable income is less than 500 euros per month in 77.01% of cases; 90.45% of the sample are of Italian nationality and 88.06% are residents of Umbria.

#### 4.1.2. Frequency and motivation of connection, activities on social networks

The 45.7% of respondents consider they have a satisfactory capacity to use Internet tools; while 41.8% consider themselves to be quite adept on the Internet.

As far as frequency is concerned (Table 5), to measure consumer behavior online it is necessary to consider the variety of device which can be connected to the Internet (Mazurek-Łopacińska & Sobocińska, 2017); despite this variety, the majority of respondents (72.24%) declare that they are “always” connected to the Internet via their smartphones and almost never via desktop PC, laptop and tablet (even less via television and smartwatch devices). The smartphone is smaller in size and weight and having it with you all the time becomes a daily routine (Ghareb, et al., 2018); due to the limitation of small screen sizes the designers need to create a positive mobile user experience (Borys, Czwórńóg & Ratajczyk, 2016).

With regard to the motivation of the connection (Table 6), an important percentage (71.64%) is “always” connected to the Internet for instant messages (such as WhatsApp and Facebook), while 47.46% make connections “several times a day” for activities on social networks and multimedia content viewing, 45.07% for study and work and 40% for news and current affairs. 49.25% of respondents connect to the web to make online purchases only “a few times a month”, although 42.99% say they connect “several times a week” to gather information on any products to buy.

Compared to the activity on social networks, the results show that in general 44% of the sample is “fairly” active on social networks and as regards the time devoted to activities on social media, most (41%) admit to spending a time ranging from 30 minutes to 2 hours per day.

Tab. 5. Frequency

	Never	Few times a month	Sometimes a week	A few times a day	I am always connected
<b>Desktop PC</b>	<b>33.43</b>	21.19	20.30	18.21	6.87
<b>Netbook/laptop</b>	<b>36.72</b>	10.15	21.19	22.99	8.96
<b>Smartphone</b>	0.90	0.00	0.90	25.97	<b>72.24</b>
<b>Tablet</b>	<b>45.97</b>	15.52	14.03	17.31	7.16
<b>TV</b>	<b>63.88</b>	11.04	10.75	12.84	1.49
<b>Smartwatch</b>	<b>93.73</b>	4.18	1.19	0.60	0.30

Tab. 6. Motivations

	Never	Few times a month	Sometimes a week	A few times a day	I am always connected
Send/receive e-mail	1.19	10.15	<b>34.03</b>	32.84	21.79
Use of social networks	2.39	2.69	6.57	<b>47.46</b>	40.90
Instant message (WhatsApp, Facebook,...)	1.19	0.30	2.09	24.78	<b>71.64</b>
Search for information about products/services to be purchased	2.99	16.42	<b>42.99</b>	28.66	8.96
Purchase product/services	8.06	<b>49.25</b>	30.75	8.66	3.28
Watch videos or other multimedia content for pure recreation	2.39	9.85	29.85	<b>47.46</b>	10.45
Playing online	<b>57.01</b>	16.12	14.63	11.34	0.90
Write reviews	<b>57.91</b>	32.84	7.46	1.79	0.00
Download content into podcast (music, e-book,...)	26.57	<b>39.40</b>	23.28	8.36	2.39
Update your own website or blog (excluding social networks)	<b>80.00</b>	10.45	6.27	2.39	0.90
Read news on websites and information blog	8.36	12.54	29.85	<b>40.00</b>	9.25
For study/work	1.79	2.39	27.46	<b>45.07</b>	23.28
Update your own website or blog (excluding social networks)	<b>80.00</b>	10.45	6.27	2.39	0.90

#### 4.1.3. Frequency, type, and expenditure for online purchases

Purchasing on the Internet is a fairly recent phenomenon. In fact, 70.7% of the participants made their first online purchase after 2009, 13.7% made the first online purchase in 2010, 12.5% in 2013 and 13.4% in 2014.

66.3% of respondents bought products online basically stimulated by their interests and about which they already knew the specific characteristics.

The data show that overall the frequency with which the investigated sample has purchased goods and/or services over the last year is very low; although slight differences can be detected depending on the type of products and services purchased (Table 7). For example, with regard to cultural services, 40.90% have never bought online tickets for concerts, museums, etc., only 35.22% bought at least 1–2 times a year, while 19.10% 3–5 times. The same result emerges with regard to public transport costs, where 31.34% had never purchased air or bus tickets, etc.

while 30.75% did so at least 1–2 times a year. Data relating to foodstuffs is significantly different, whereas for cosmetic products, financial products, and household products, the majority of the sample declares that they have never made online purchases.

As regards to the expense incurred for online purchases (Table 8), the percentage of those who declare that they have not spent in the last year for any of the types of products/services identified is very high overall. However, there are some interesting differences. Most of the sample said they spent between 1 and 100 euros for cultural products (books, films, etc.) (47.16%) and cultural services (tickets for the theatre, museums, etc.) (45.97%), while the percentages for the same products in the higher cost range are not significant. With regards to public transport costs, the percentages tend to be less extreme: 25.97% spent between 1 and 100 euros, 20.60% from 101 to 250 and 13.13% from 251 to 500. A similar trend is also found in the case of expenses for the purchase of hotel services.

**Tab. 7. Frequency of online purchases (%)**

Have you purchased the following products in the last year?	Never	1–2 times	3–5 times	6–10 times	More than 10 times
<b>Cultural products (digital/non digital) (books, films, music)</b>	<b>33.73</b>	26.57	24.48	9.55	5.67
<b>Cultural services (tickets for cinema, theatre, museums,...)</b>	<b>40.90</b>	35.22	19.10	2.99	1.79
<b>Clothing</b>	<b>35.52</b>	29.85	18.21	10.75	5.67
<b>Apps/software</b>	<b>48.36</b>	26.27	13.43	7.46	4.48
<b>Electronics/Appliances</b>	<b>54.63</b>	25.97	14.03	3.88	1.49
<b>Tickets of transport (plane, train, bus)</b>	<b>31.34</b>	30.75	19.40	9.85	8.66
<b>Accommodation</b>	30.75	<b>31.34</b>	26.87	7.76	3.28
<b>Food</b>	<b>92.54</b>	5.37	0.60	0.90	0.60
<b>Household items</b>	<b>64.48</b>	23.88	9.85	1.19	0.60
<b>Education and training</b>	<b>45.67</b>	27.16	15.82	8.66	2.69
<b>Banking products</b>	<b>79.70</b>	10.75	6.57	2.09	0.90
<b>Beauty and cosmetics</b>	<b>70.75</b>	17.31	8.06	1.79	2.09

Tab. 8. Expenditure of online purchases

Over the past year, what was the cost you spend on online purchases of the following products?	0	1–100	101–250	251–500	More than 500
Cultural products (digital/non digital) (books, films, music)	34.33	<b>47.16</b>	14.93	2.99	0.60
Cultural services (tickets for cinema, theatre, museums,...)	43.88	<b>45.97</b>	8.06	2.09	0.00
Clothing	<b>37.91</b>	31.04	20.90	7.76	2.39
Apps/software	<b>63.58</b>	31.64	3.58	1.19	0.00
Electronics/Appliances	<b>58.51</b>	23.88	8.96	5.07	3.58
Tickets of transport (plane, train, bus)	<b>33.73</b>	25.97	20.60	13.13	6.57
Accommodation	<b>32.84</b>	17.01	27.16	17.01	5.97
Food	<b>93.13</b>	5.97	0.60	0.30	0.00
Household items	<b>67.76</b>	28.66	2.99	0.60	0.00
Education and training	<b>49.85</b>	34.93	11.34	2.69	1.19
Banking products	<b>84.48</b>	10.45	1.49	1.79	1.79
Beauty and cosmetics	<b>73.73</b>	20.90	3.28	1.49	0.60

#### 4.1.4. Online purchase channels

The most used channel to buy online is the marketplace: 32.24% of the sample declares using it “Much” and 27.76% “Very much”. Seller websites are less used: 32.54% admit buying “Little” from the seller, while 26.57% “Quite”. It is interesting to note that the data concerning the social network channels and that of commercial organizations such as Groupon, for which the interviewees say they “Never” use them (67.16% and 44.48% respectively).

Tab. 9. The channel used to buy online

	Never	Little	Quite	Much	Very much
Seller websites	12.54	<b>32.54</b>	26.57	19.10	9.25
Marketplaces	5.97	13.13	20.90	<b>32.24</b>	27.76
Facebook or other social networks	<b>67.16</b>	23.58	6.27	2.39	0.60
Websites of collective purchase (Offer, Groupon,...)	<b>44.48</b>	29.85	16.72	6.57	2.39

Although the use of social networks to buy online is not important, the high connection of respondents in this media obliged companies to make their presence felt on these networks (Infante-Moro, et al., 2016) in order of contact with them. Moreover, these authors state that there is a connection between companies that have online social networks presence and the use of e-commerce to sell their products.

#### 4.1.5. Propensity to share the online shopping experiences

With respect to post-purchase behavior – linked in particular to online sharing – the data shows substantial inactivity, unlike what has been stated by several studies on the subject conducted so far and cited previously. The vast majority of respondents never share the purchase of products online on social networks (80.30%). Similar results for all forms of online socialization, or “I write reviews on specialized sites” (never for 61.19%); “I write on the seller's site (if possible)” (never for 63.38%); “I become a fan of the social network page or register with the site” (never for 43.58%); “I answer questions in forums or groups” (never for 71.94%). The only activity of socialization practiced is summarized by the statement “I speak verbally with family and friends”. This happens in the case of “enough” (44.18%), “very often” (23.58%) and “always” (10.15%).

**Tab. 10. Sharing of online purchases**

	Never	Little	Enough	Very often	Always
<b>I share the purchase on social networks</b>	<b>80.30</b>	16.12	2.09	1.19	0.30
<b>I write reviews on specialized sites</b>	<b>61.19</b>	24.18	12.24	1.49	0.90
<b>I write on the seller's site (if possible)</b>	<b>63.38</b>	21.79	9.25	3.28	1.79
<b>I become a fan of the social network page or I register with the site</b>	<b>43.58</b>	24.18	22.39	7.76	2.09
<b>I speak verbally with family and friends</b>	7.46	14.63	<b>44.18</b>	23.58	10.15
<b>I answer questions in forums or groups</b>	<b>71.94</b>	22.69	3.88	1.49	0.00

#### 4.2. Structural model analysis

In this section we carried out the estimation by partial squared minima method, using the application SmartPLS 2.0, to verify the hypotheses proposed in this paper.

##### 4.2.1. Reliability and validity of the measurement instrument

The original proposed model has been refined in order to satisfy the individual reliability properties. For this reason, three items have been removed: U7, R6, and R7, in order not to go over the level of 0.55 (Falk & Miller, 1992). After this process, the validity and reliability of the measurement instruments were satisfied (Table 11).

Regarding the reliability of the scales, both scales pass the level of 0.7 established in Cronbach's Alpha (Cronbach, 1970; Nunnally, 1978).

The composite reliability (IFC) is also supported, because every scale passes the limit of 0.6 (Bagozzi & Yi, 1988).

The convergent validity is also confirmed in both scales, because the AVE indicator passes the limit of 0.5 (Fornell & Larcker, 1981). The discriminant validity is also confirmed as each item weighs more than the latent factor which it is assigned.

Finally, the measurement scales used in the proposed model satisfied the validity and reliability properties.

**Tab. 11. Properties of the scales**

	Items	Standardised factor	t	Cronbach's Alpha	IFC	AVE
Perceived usefulness	U1	0.661	16.639***	0.897	0.909	0.558
	U2	0.791	32.906***			
	U3	0.784	28.240***			
	U4	0.768	27.277***			
	U5	0.769	27.776***			
	U6	0.629	16.353***			
	U8	0.750	24.088***			
	U9	0.806	37.269***			
Perceived risk	R1	0.827	23.273***	0.826	0.875	0.584
	R2	0.763	15.117***			
	R3	0.751	14.784***			
	R4	0.741	13.620***			
	R5	0.733	12.239***			

Note: \*\*\*  $p < 0.01$  ( $t_{(0.01;\infty)} = 2.3263$ ); \*\*  $p < 0.05$  ( $t_{(0.05;\infty)} = 1.6449$ ); \*  $p < 0.1$  ( $t_{(0.1;\infty)} = 1.2816$ ).

#### 4.2.2. Structural model

The estimated model has a good overall adjustment, the final variable “intention of use” has an R2 coefficient greater than 0.10 (Falk & Miller, 1992).

**Tab. 12. Worth of the fit model**

Variable	R <sup>2</sup>
Intention of use	0.302
Ease of use	0.012
Perceived usefulness	0.000

Moreover, the model has a mediumhigh predictive relevance, as Q2 indicator raises the value of 0.267 (Chin, 1998).

In the structural model, we observe that only two of the seven hypotheses pass the limit of 0.2 in  $\beta$  coefficients. Moreover, only three of the seven hypotheses have been empirically proven, with regard to the statistical significance of the relationship (Table 13).

**Tab. 13. Hypotheses**

<b>Hypotheses</b>	<b><math>\beta</math> standardised</b>	<b>t Bootstrap</b>
Perceived usefulness → Intention of use	0.493	11.211***
Ease of use → Intention of use	0.017	0.339
Ease of use → Perceived usefulness	0.022	0.342
Perceived risk → Intention of use	-0.240	4.437***
Perceived risk → Ease of use	-0.109	1.858**
Social presence → Ease of use	0.007	0.131
Social presence → Intention of use	-0.006	0.122

**Note:** \*\*\*  $p < 0.01$  ( $t_{(0.01, \infty)} = 2.3263$ ); \*\*  $p < 0.05$  ( $t_{(0.05, 499)} = 1.6449$ ); \*  $p < 0.1$  ( $t_{(0.1, 499)} = 1.2816$ ).

## 5. CONCLUSIONS

This paper analyzes the purchasing behavior of young university students, particularly their propensity to connect to the Internet, use social networks and make online purchases. Several points for reflection emerge, both theoretical and empirical, that may be useful to scholars and operators.

An interesting evidence is the prevalence of using the Internet for social activities rather than for purchases. In fact, the propensity to purchase online is still very limited and mainly concerns cultural and tourist services rather than physical products. Mobile devices are the main devices for connecting students to the Web and, consequently, the most used for purchasing online; so, companies need to create a good web design to favor e-commerce.

Three main factors emerge, which seem to encourage online shopping: the opportunity to save time and money, the ability to compare products/services, and the possibility to obtain reviews and suggestions from other consumers.

Among the factors perceived as a limit to online purchases there is the impossibility to "touch" the product, as well as the fear of receiving the wrong item and the lack of transparency in the buying procedure. Unlike what has been found in other studies, trust in payment methods is not a limit to online shopping according to the sample analysed in this paper.

In relation to the ways through which online shopping takes place, the preferred channels are mainly the marketplaces (e.g. Amazon); the sample show less interest in the official supplier websites.

Regarding social networks, respondents do not usually use them to buy online, however the high connection of society in this media becomes it in a good vehicle for companies to connect their offer with the demand.

According to the results of the statistical analysis, the intention to use e-commerce (through recommendation) is positively influenced by the perceived usefulness and negatively by the perceived risk. This means that the greater the perceived usefulness, the greater the intention of use and the greater the perceived risk, the lower the intention of use. However, ease of use (through the ability to use devices) does not have a significant direct effect.



Unlike previous studies, this article does not show a significant influence of ease of use on perceived usefulness, although the relationship is positive. It seems that with a greater ease of use, there is a greater perceived usefulness.

Regarding the antecedents of ease of use, the perceived risk has a significant negative effect. This means that the greater the perception of risk, the lower the ease of use, as verified in previous studies.

As regards social presence (level of activity in social networks), this paper does not find a significant influence of this variable on ease of use and on the intention of use. In spite of these non-significant influences, the level of social networks activity has a positive influence on ease of use; but, in contrast to other studies, this study reveals a negative influence on intention of use.

Despite some interesting findings, this research presents at least two limits, which evolve from the sample analysed. The first relates to the territorial concentration of respondents, given that the survey only concerns students from the University of Perugia, the vast majority of whom live in Umbria Region. The second refers to the low spending power of the students, which does not guarantee the sample heterogeneity according to the income parameters (over 91% declares an available income of less than 750 euros per month). Additionally, this behavior could be different in the current context defined by Covid 19. We pretend to turn these limitations into future research lines.

Further research is required in this field with the aim of examining in depth the variables affecting online shopping. What is the role of factors such as previous online purchasing experience and the motivations (social, cultural and economic) that lead people to purchase online? At the same time, an interesting research question could be related to the analysis of the multidimensional nature of the risks associated with online shopping and perceived usefulness. The last future research line is the influence of other variables such as the situation defined by the health crisis by Covid 19.

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