

## Understanding the Purchase Behaviour of Turkish Consumers in B2C E-Commerce

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**Abstract:** The significant improvements in communication technologies revealed innovative online services. Time and location barriers have been eliminated and customer satisfaction has gained importance. The most remarkable evolution is observed in electronic commerce. Electronic commerce is a widely accepted industry which provides an effective medium for both retailers and customers, enabling to perform online transactions through websites. The analysis of consumer preferences has become a key aspect in this challenging environment. In this study, the behaviours of Turkish consumers were identified to provide an insight to the practitioners. We examined the moderator effect of consumers' socio-demographic characteristics on online purchasing behaviours. A questionnaire was designed by using the existing literature. A data set of 337 valid records were collected by a questionnaire and analysed by applying association rule mining method. Several interesting rules representing the preferences of online consumers were determined. The results show that the behaviours of Turkish online consumers are related with their demographic characteristics.

**Keywords:** e-commerce, consumer preferences, online shopping behaviour, generalized rule induction.

### 1. Introduction

The interaction between individuals has been evolved with the great improvements in communication technologies. Internet has become an essential part of the personal and business life which has the capability of supporting daily activities. Rapid developments continuously outcome new features and services. The location and time barriers were both eliminated. The computers have become dominant devices for communication, entertainment, business, and information. It is necessary to have a personal computer with Internet connection in order to remain connected to the society.

One of the most remarkable developments was observed in the area of business and commerce. Electronic commerce (e-commerce) or Internet-based purchase, that means buying and selling goods and services online, is a widely accepted industry. E-commerce is briefly defined as the production, advertising, sale, and distribution of products via telecommunication networks [1]. E-commerce stands for turning business with paperwork processes into a paperless environment through any type of electronic technology [2]. It certainly has a great influence on changing the business process and the organizational structures. E-commerce also presents challenges for companies, demanding a review of marketing strategies and consumer knowledge [3].

In late 1990s, several organizations expanded their activities with the advances in e-commerce to increase their share in the market and offer new opportunities to their existing customers. However,

most of them failed due to wrong cost/benefit models, internal problems in organization and execution, the lack of competitive advantage, ineffective warehouse management, mismatching consumer needs and poor customer relations [4].

Obviously, the methods followed while identifying the user behaviour and generating consumer profiles for e-commerce are not as relatively simple as understanding the intentions in traditional face to face shopping. There are two primary perspectives and roles in traditional business environment: The buyer and the seller. When you go to a store as a customer, making observations might be sufficient to analyse the person you are dealing with. The interaction and the store are both physical which would give the seller the opportunity to solve majority of further encountered problems. Similarly, it is possible to understand the purchase intention and the product choice when a retailer meets with a buyer in person. The verbal communication, expressions and even the physical gestures would give a clue about the customers' decision. Conclusively, the customer satisfaction might be increased by the combination of knowledge on buyer and the experience of the seller.

Understanding the consumer behaviour is the key aspect for the success of e-commerce which allows modelling better marketing solutions. But the behaviour does not remain stable and managing that is a challenge. Evaluating the process from the consumers' perspective plays an important role in predicting future purchase intentions, and choices in increasing the market share, and achieving competitive advantages [5]. It was shown that the customer satisfaction affects the loyalty.

Majority of research in e-commerce have focused on countries with a high economic and technological development. Nevertheless, the worldwide growth of e-commerce has shown the need to extend this research to other countries with great potential for growth but different cultures. Cultural differences may affect consumer behaviours and preferences [6]. Today, the number of e-commerce companies and consumers are increasing

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continuously. Shopping through Internet is consistently increasing in Turkey.

Users' demographic information is related to their online shopping behaviour in several research articles within the e-commerce framework. The adoption of e-commerce and users' attitudes toward it is associated with gender [7, 8, 9], age [7, 9, 10, 11], education [8], and occupation [7].

In this study, the purchase behaviour of the electronic customers is identified to provide an insight to the e-commerce practitioners in Turkey. A survey was designed by considering the previous studies. It was both distributed online and applied face-to-face. A data set containing 337 valid responses was gathered and analysed by applying Generalized Rule Induction (GRI), which is a machine learning algorithm. The GRI method was used to discover some interesting rules about the consumer behaviour on purchasing online [12].

## 2. Theoretical Background

E-commerce can be divided into components depending on the business type, nature of participants, and the variety of goods serviced. The primary categories may be listed as B2B (Business-to-Business), B2C (Business-to-Consumer), C2C (Consumer-to-Consumer), G2G (Government-to-Government), and B2G (Business-to-Government). Initially, the interest on the e-commerce related studies by the academic community had risen within B2C perspective. The issues such as brand identity [13], perception [14], consumer behaviour [5, 10, 15 - 22], user interface design [23, 24], and trust [25, 26, 27] were covered in the literature.

An effective environment for both retailers and consumers was established by B2C e-commerce to perform online transactions through the websites [28]. It is more attractive, convenient, energy and time saving than visiting malls and stores physically [29]. The broader selection of products and the competitive pricing can also be considered as other primary advantages [17]. Several authors have shown that users' social demographic characteristics affect both motivations on online purchasing and the advantages sought through this channel [7, 9, 30, 31].

The experiences in performing at this environment also affect the perception [32]. Individuals' capability of using information technology also has a significant impact on perceptions and attitudes [33]. Various promotion tools are commonly used in the marketplace to keep the consumers' attraction such as coupons, bundling, free samples, and premiums [13]. Consumers have highly positive perceptions towards sponsored recommendation posts when products recommended in blog posts have high brand awareness [13].

Lack of security and the network reliability are highlighted as the most important obstacles to online shopping [34]. It was also suggested that transaction security, pricing, IT education, and vendor quality significantly affect the willingness of purchasing goods online [34]. Trust was also accepted as a significant factor affecting the adoption of e-commerce applications [26]. Consumers are intended to pay more if the cost of information search is low [35]. A theoretical model of consumer's intention was developed for e-commerce adoption [18]. The adoption decisions are strongly influenced by their perception of ease of use, and risk. Price [36, 37, 38], variety [38, 39], product quality [34, 36], effort [40, 41], compatibility [42], and information access [38, 41, 43] were identified empirically as the factors affecting e-commerce adoption.

Several studies argued that males and females perceive different

capabilities in e-commerce while women are focusing on trust, the ability of sharing opinions; and men are focusing more on the value gained through the purchase [39, 44]. Women accept online shopping as a social activity rather than a technology adoption [39]. The benefits of e-commerce for both the organizations and the consumers are still the crucial factors that shape the perception of e-commerce success [31]. Men with high trust propensity are the most benefit oriented consumer group [30]. It is important to note that national culture and trust are associated [45]. Thus, the perception of trustworthiness of e-commerce web sites may be influenced by national culture [45].

Issues cannot be directed and managed by applying similar strategies in online environment. The lack of face-to-face interaction reveals a need to generate some other consumer related data collection methods. Currently, practitioners and researchers are utilizing Internet in gathering detailed information as the marketing management methodologies on Internet advance. The capability of monitoring the whole shopping procedure of an individual, not only what has been ordered, also what was selected or dropped from the cart [16].

The data sets required in identifying consumer profiles, shopping behaviour, and other associated fields of e-commerce are generally huge. Data mining techniques have become useful and important to analyse that amount of data [46, 47]. The changes in consumer behaviour types were evaluated by a method established with the integration of demographic variable, behavioural parameters and a transaction database [46]. Association rule mining technique was implemented to improve the identification of product portfolio by an explicit decision support system [47]. A semi-Markov process model as a web usage mining tool was used to understand the e-consumer behaviour by implementing it in an example site with a software agent [15]. Navigational data was collected to improve the design of the website and analyse the performance.

Recently, customer segmentation has also been applied in e-commerce studies [48]. Moreover, some studies investigated the associations between social network usage and e-commerce activities [49, 50]. Another interesting application of e-commerce activities was investigating e-commerce users' behaviours in detecting the identity theft [51]. The authors found that the security and account monitoring may be associated with reducing the frequency of identity theft [51]. Cross-border e-commerce activities have also been explored [52]. The authors investigated the drivers affecting the decisions in cross-border e-commerce activities. They found that education, gender, computer and internet skills, having foreign nationality are significant positive factors in determining cross-border e-commerce activities [52].

## 3. Methodology

### 3.1. Participants

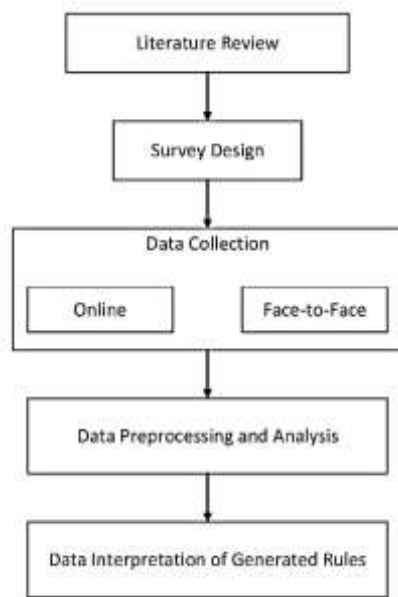
The participants of this study are randomly selected through the consumers who have done shopping at least once using an e-commerce company. The minimum sample size we need to model the behaviour of Turkish consumers is evaluated through the following relation (Eq.1)

$$n = \frac{Z^2 \times p \times (1 - p)}{e^2} \quad (1)$$

where n, Z, p and e are sample size, z-score, proportion of an attribute that is present in the population and margin of error respectively [53]. In this study, the confidence level is selected as

95%. The corresponding values of these parameters are  $Z=1.96$ ,  $p=9,500,000/30,000,000=0.32$ , and  $e=0.05$ . According to [54], there are 54 million credit cards in Turkey and 17 million of them are used for internet sales only. Average number of credit cards per person is 1.8. Thus, approximately 9.5 million people might have used their credit cards in e-commerce activities. Consequently, the total number of credit card holders can be calculated as 54 million/1.8=30 million.

Using the above relation with these values, we get 334 as the sample size,  $n$ . However, there are 337 participants in this study which means the sample size satisfies the minimum requirement. 182 male and 155 female consumers participated in this research. The participants are mostly from the age interval of 18-30, holding a bachelor degree and are mostly from the middle income group. Table 1 shows a more detailed statistical analysis on the demographic information of the participants. Moreover, a general block of the proposed study is provided in the Figure 1.



**Figure 1.** A general block diagram of proposed study

### 3.2. Data Collection

A questionnaire was prepared to understand the Turkish consumer behaviour in e-commerce environment. The questionnaire was applied online to some of the consumers in addition to face-to-face communication technique that is used to collect data from some other consumers.

The survey items were identified by considering the existing literature [40, 55]. The variables taken into consideration in the questionnaire are given in Table 2. Table 2 also includes the items related to each variable.

The questionnaire was divided into two main parts. The first part, of which the details are given in Table 1, is composed of demographic information of the participants. The second part includes the questions related to observations of the consumer behaviour of the Turkish customers through a number of variables with some items as they are given in Table 2. The demographic information consists of gender, age, marital status, education, and monthly income. The questions identifying the consumer behaviour are about product types purchased through internet, frequency of Internet shopping, preferred payment types, shopping seasons, security, devices used for shopping, prices, priorities, and service quality.

**Table 1:** Demographics of participants.

Category	Items	Frequency	Percent
Gender	Male	182	54.0
	Female	155	46.0
Age	18 – 30	177	52.5
	31 – 43	135	40.1
	44 >	25	7.4
Marital Status	Married	165	49.0
	Single	172	51.0
Education	High School	66	19.6
	Community College	63	18.7
	Undergrad. School	151	44.8
	Graduate School	57	16.9
Monthly Income (in Turkish Liras)	0 – 1500	44	13.1
	1501 – 2500	147	43.6
	2501 – 5000	128	38.0
	5000 >	18	5.3

**Table 2:** Survey Items

Product Types (PT)		Freq. of Internet Shopping (FR)	
PT1	Technological	FR1	Never
PT2	Gifts	FR2	Rarely
PT3	Home Accessories	FR3	Sometimes
PT4	Textile/Clothing	FR4	Often
PT5	Books/Stationery	FR5	Always
Payment (PY)		Season (SE)	
PY1	Cash	SE1	Spring/Summer
PY2	Credit Card	SE2	Fall/Winter
PY3	Payment on Delivery	SE3	Holiday
PY4	Mobile Payment	SE4	School
Security (SC)		Devices (DV)	
SC1	SSL Certificate	DV1	PC at home
SC2	3D Secure Certificate	DV2	PC at office
SC3	Virtual Card	DV3	PC at school
SC4	Reading Comments	DV4	Mobile/Laptop
Priorities (PR)		Service Quality (SQ)	
PR1	Price of the product/service	SQ1	Easy product return
PR2	Quality of the prod./service	SQ2	Delivery on time
PR3	Trademark of prod./service	SQ3	In-stock information
PR4	Delivery of product/service	SQ4	Correct product information
Price (in Turkish Liras) (PC)			
PC1	0 – 300		
PC2	301 – 500		
PC3	501 – 1000		
PC4	1001 – 3000		
PC5	3000 >		

### 3.3. Data Analysis

The data analysis covers measuring the goodness of fit, reliability, convergent validity, and discriminant validity. The RMSEA (Root Mean Square Error of Approximation) and SRMR (Standardized Root Mean Square Residual) values were 0.05 and 0.09 respectively. These values are exactly the thresholds defined to be a good model. The reliability of the collected data was determined by evaluating the Cronbach's alpha. The analysis gave the Cronbach's alpha value as .82 which means good internal consistency of the items in the scale that proves reliability of the data. In addition, an ANOVA based reliability test was performed through evaluating the average item reliability and the entire reliability. The average item reliability is a test on whether it is reliable to make an analysis using the individual items. The entire reliability tests whether using all items in the model is reliable [56]. The average item reliability was calculated as 0.35 which is

“slight”. The entire reliability was obtained as 0.99 which is substantial [57]. The results showed that all items of the survey should be included in the model that is highly reliable. Reliability was also examined using the composite reliability values. These values are given in Table 3. Table 3 shows that all corresponding values are above the commonly used threshold, 0.70 [58].

**Table 3:** Descriptive statistics of variables.

Variables	Items	Composite Reliability	Mean (SD)	AVE
Product Types	5	0.83	2.85 (1.43)	0.77
Frequency of Internet Shopping	5	0.81	2.60 (0.91)	0.75
Payment	4	0.75	2.01 (0.50)	0.78
Season	4	0.91	1.68 (0.86)	0.79
Security	4	0.89	3.45 (0.99)	0.85
Devices	4	0.78	1.38 (0.79)	0.73
Priorities	4	0.94	1.39 (0.86)	0.87
Service Quality	4	0.95	2.56 (0.90)	0.85
Price	5	0.79	1.34 (0.81)	0.83

Confirmatory factor analysis approach was applied to establish the convergent validity and discriminant validity. Convergent validity was examined by the criterion defined through the average variance extracted (AVE). The threshold is 0.50 for AVE and Table 3 shows that the AVE values of all variables lie between 0.73 and 0.87, and exceed the considered threshold [58]. Discriminant validity was tested using the square root of AVE and the correlations among variables. The model is valid when the square root of the AVE of a variable is larger than the correlations among that variable and the other variables. The values given in Table 4 indicate good discriminant validity. Therefore, our model has a good reliability and sufficient validity.

### 3.4. Tools

Association rule learning is used for discovering probabilistic relationships between variables in large databases. Generalized Rule Induction (GRI) is an association rule based machine learning algorithm and extracts formal rules from a set of observations [12]. This is a powerful method for market basket analysis which aims to find regularities in the shopping behaviour of customers.

**Table 4:** Correlation among variables and the square root of the AVE (Significant level at 0.01 level).

	PT	FR	PY	SE	SC	DV	PR	SQ	PC
PT	.88								
FR	.77	.87							
PY	.38	.42	.93						
SE	.74	.84	.43	.89					
SC	.20	.26	.63	.32	.92				
DV	.08	.22	.18	.62	.20	.85			
PR	-.56	-.56	-.57	-.29	-.40	.41	.88		
SQ	-.36	-.48	-.60	-.78	-.60	-.82	.02	.91	
PC	.10	.17	.47	.24	.34	-.02	-.57	-.32	.92

An association rule is a rule which presents an association between items. An association rule tells us if a customer, chosen at random, has selected a certain item, this can assure the customer also will select another item that is determined by the association rule. The “if” component of an association rule is called the antecedent while the “then” component is named as the consequent. The most critical issue here is to get meaningful and reliable association rules. In this sense, there are two quality

measures; support and confidence.

The support is the proportion of transactions in the data set satisfying the item set. This support is the probability of having that item set in the set of all transactions. For example, having a support of 25% means, that item set appears once out of four transactions.

The confidence measures the strength of the rule and gives a probability of having an item B knowing that we have item A. High confidence for a rule corresponds to have a high probability of defining a true rule which helps for often making correct predictions.

Two thresholds, minimum support and minimum confidence, must be defined to generate good association rules. Large number of rules is generated when low minimum support and minimum confidence thresholds are chosen. Selecting high thresholds and keeping the rules satisfying these thresholds result in strong relationships between items through fewer rules.

## 4. Results

The GRI Algorithm was applied to conduct association analysis on the collected data in order to determine the consumer behaviour. The primary advantage of GRI Algorithm is its capability of distinguishing interesting findings from predictable ones. The minimum support threshold and the minimum confidence threshold parameters of the GRI Algorithm were selected as 10% and 50% respectively. Moreover, the group parameters were chosen particularly for generating the rules for the association of the demographic information of the consumers and the variables of the survey. More specifically, these rules describe the relationships between gender, age, marital status, education, monthly income and the variables including product types, frequency of internet shopping, payment types, shopping seasons, security, devices used for shopping, prices, priorities, and service quality. The rules were given in Table 5 and the brief findings are listed below:

**Table 5:** Rules generated to show the relationships between the demographic information and the main variables (minimum support threshold = 10%, minimum confidence threshold = 50%)

Consequent	Antecedent	Confidence	Support
Gender = 1	Product Type = 1	87.14	20.77
Marital Status = 2	Payment = 1	75.0	10.68
Age = 1	Payment = 1	75.0	10.68
Marital Status = 1	Device = 2	68.75	23.74
Gender = 2	Frequency = 3	67.5	35.61
Gender = 2	Product Type = 4	67.01	28.78
Marital Status = 1	Frequency = 2	62.39	34.72
Marital Status = 2	Frequency = 3	61.67	35.61
Age = 1	Frequency = 3	60.0	35.61
Marital Status = 2	Product Type = 4	59.79	28.78
Education = 3	Service Quality = 1	59.62	15.43
Age = 1	Product Type = 4	58.76	28.78
Age = 1	Device = 1	58.44	72.11
Age = 1	Product Type = 2	57.41	32.05
Marital Status = 1	Product Type = 5	56.86	15.13
Age = 2	Device = 2	56.25	23.74
Income = 3	Season = 2	54.46	29.97
Marital Status = 1	Product Type = 1	52.86	20.77
Income = 2	Season = 1	52.78	53.41
Education = 3	Frequency = 2	51.28	34.72
Gender = 2	Product Type = 2	50.93	32.05
Income = 2	Frequency = 3	50.0	35.61
Marital Status = 2	Product Type = 2	50.0	32.05

- 87% of consumers who prefer to purchase technological products online are males.
- 75% of consumers who prefer to make cash payment are married.
- 75% of consumers who prefer to make cash payment are aged between 18 and 30 years.
- 69% of consumers who use PC at office for online shopping are married.
- 68% of consumers who sometimes shop online are females.
- 67% of consumers who prefer to purchase textile/clothing products are females.
- 62% of consumers who rarely shop online are married.
- 62% of consumers who sometimes shop online are singles.
- 60% of consumers who sometimes shop online are aged between 18 and 30 years.
- 60% of consumers who prefer to purchase textile/clothing products are single.
- 60% of consumers who consider service quality as easy product return hold a bachelor degree.
- 60% of consumers who prefer to purchase textile/clothing products online are aged between 18 and 30 years.
- 59% of consumers who use PC at home for online shopping are aged between 18 and 30 years.
- 57% of consumers who prefer to purchase gifts online are aged between 18 and 30 years.
- 57% of consumers who prefer to purchase books/stationery online are married.
- 56% of consumers who use PC at office for online shopping are aged between 31 and 43 years.
- 55% of consumers who prefer to shop online on fall/winter season have an income between 2501 and 5000 Turkish Liras.
- 53% of consumers who prefer to purchase technological devices online are married.
- 53% of consumers who prefer to shop online on spring/summer season have an income between 1001 and 2500 Turkish Liras.
- 51% of consumers who shop online rarely hold a bachelor degree.
- 51% of consumers who prefer to purchase gifts online are females.
- 50% of consumers who sometimes shop online have an income between 1001 and 2500 Turkish Liras.
- 50% of consumers who prefer to purchase gifts online are singles.

Finally, twenty three rules representing the shopping behaviour of Turkish consumers associated with the demographic information were identified.

The second group presents the relationships between the items of different survey variables as given in Table 6. There are again twenty three rules representing the associations between the primary variables in this research. The list of these rules is given as follows:

- 92% of consumers who sometimes shop online prefer purchasing products priced between 0 and 300 Turkish

Liras.

- 90% of consumers who use PC at office prefer credit card as a payment method.
- 89% of consumers who purchase textile/clothing products online prefer credit card as a payment method.
- 84% of consumers who purchase textile/clothing products online give the highest priority to the price of the product/service.
- 83% of consumers who purchase technological products online shop via PC at home.
- 81% of consumers who purchase gifts online give the highest priority to the price of the product/service.
- 80% of consumers who purchase technological products online consider security issues by reading posted comments on site.
- 80% of consumers who purchase technological products online give the highest priority to the price of the product/service.

**Table 6:** Rules generated to show the relationships between the main variables (minimum support threshold = 10%, minimum confidence threshold = 50%)

<i>Consequent</i>	<i>Antecedent</i>	<i>Confidence (%)</i>	<i>Support (%)</i>
Price = 1	Frequency = 3	91.67	35.61
Payment = 2	Device = 2	90.0	23.74
Payment = 2	Product Type = 4	88.66	28.78
Priority = 1	Product Type = 4	83.51	28.78
Device = 1	Product Type = 1	82.86	20.77
Priority = 1	Product Type = 2	80.56	32.05
Security = 4	Product Type = 1	80.0	20.77
Priority = 1	Product Type = 1	80.0	20.77
Season = 1	Frequency = 3	71.67	35.61
Frequency = 3	Product Type = 4	71.13	28.78
Price = 1	Product Type = 1	70.0	20.77
Payment = 2	Product Type = 1	70.0	20.77
Priority = 1	Product Type = 5	68.63	15.13
Season = 1	Product Type = 4	68.04	28.78
Priority = 1	Price = 2	65.71	Eki.39
Security = 4	Product Type = 4	64.95	28.78
Security = 4	Device = 2	62.5	23.74
Service Quality = 3	Payment = 1	61.11	Eki.68
Frequency = 2	Product Type = 5	60.78	15.13
Product Type = 4	Frequency = 3	57.5	35.61
Service Quality = 3	Product Type = 5	54.9	15.13
Season = 1	Product Type = 1	54.29	20.77
Service Quality = 3	Product Type = 1	52.86	20.77

- 72% of consumers who sometimes shop online prefer spring/summer season.
- 71% of consumers who purchase textile/clothing products via web sometimes shop online.
- 70% of consumers who purchase technological products online prefer purchasing products priced between 0 and 300 Turkish Liras.
- 70% of consumers who purchase technological products online prefer credit card as a payment method.
- 69% of consumers who purchase books/stationary

online give the highest priority to the price of the product/service.

- 68% of consumers who purchase textile/clothing products online prefer spring/summer season.
- 66% of consumers spend an amount between 301 and 500 Turkish Liras on online shopping give the highest priority to the price of the product/service.
- 65% of consumers who purchase textile/clothing products online consider security issues by reading posted comments.
- 63% of consumers who shop online via PC at home consider security issues by reading posted comments.
- 61% of consumers who pay cash for shopping online consider service quality issues by in-stock information presented on the web site.
- 61% of consumers who purchase books/stationary sometimes shop online.
- 58% of consumers who sometime shop online prefer purchasing textile/clothing products.
- 55% of consumers who purchase books/stationary online consider service quality issues by in-stock information presented on the web site.
- 54% of consumers who purchase technological products online prefer spring/summer season.
- 53% of consumers who purchase technological products online consider service quality issues by in-stock information presented on the web site.

## 5. Discussions

Most studies in the literature have focused on countries with a high socioeconomic development and a greater interest and use towards the communication technologies. The researchers mainly concentrated on the behaviour of electronic consumers living in USA, Canada, Germany and Scandinavian countries. The investigations should be extended to the developing cultures to gain opportunity at the international e-commerce market. It is also important to consider the characteristics of the culture under study from social, economic, and technological perspectives while examining the behaviour of e-commerce users. In this sense, we investigated specific behaviour types of Turkish electronic consumers while shopping online in providing new insight to the literature. In this paper, the moderator effect of consumers' socio-demographic characteristics on online purchasing behaviour was examined.

The corresponding online shopping behaviour types of the consumers were identified by applying the GRI algorithm after completing data collection by online and face to face surveys. The empirical evidence found by this research also highlights the fact that users' socio-demographic characteristics have different effects on their decisions to purchase online. The behaviour types in this context are highly correlated with age, gender and marital status.

Majority of male consumers prefer to purchase technological devices online. Female consumers sometimes perform e-commerce activities; prefer to purchase textile/clothing products and gifts. Men and women have different preferences regarding different shopping product types [59]. Men have a relatively more positive attitude toward online shopping [60]. Married consumers pay cash, rarely shop while working, and prefer to purchase books/stationary items and technological devices online. Single sometimes shop online; prefer to purchase textile/clothing products and gifts. Significant differences have been noticed in

online shopping behaviours between consumers of different age levels [61].

Consumers aged between 18 and 30 years prefer to pay cash, sometimes perform e-commerce activities, purchase textile/clothing products and gifts, and use their own PC at home for commercial issues. Consumers' perception of product price promotions, benefits, and financial risk affect their intention to shop textile products online [62]. In contrast, older people use their PC at office for online shopping. However, less number of e-commerce websites has been designed with the elderly in mind [63]. Brand trust was also achieved through several brand experiences, brand familiarity, and customer satisfaction on cognition and emotional factor [64]. Trustworthiness promotes both intention to buy and actual financial risk taking [65]. Individuals holding a bachelor degree consider service quality as easy product return under unexpected circumstances, and shop rarely. Value and tradition are critical barriers causing users to refuse shopping online [60]. Consumers with an income ranged between 1501 and 2500 Turkish Liras sometimes shop online mostly on spring/summer season.

Twenty three rules were identified representing the associations between the primary variables (product types, payment, security, price, priorities, service quality, frequency of shopping online, season, and devices used). We have found that consumers who purchase technological products by using their own PC at home consider security issues by reading posted comments on site, and give highest priority to pricing, spend 300 Turkish Liras maximum per transaction, pay by credit cards, and prefer to shop on spring/summer season, and measure the service quality by in-stock information presented on the web site. Perceived risk is the primary factor that influences the decision for purchasing online [42, 66, 67]. Consumers who purchase textile/clothing products consider security issues by reading posted comments, shop sometimes especially on spring/summer season, pay by credit card, and give the highest priority to the price of the product/service. In information systems literature, the influence of online reviews has received empirical support by several researches [68, 69, 70]. Inconsistent reviews play an important role in consumers' online shopping decisions [31]. The influence of emotional trust which leads to purchase intention is significantly stronger when consumers are exposed to inconsistent reviews. The effect of inconsistent reviews is stronger for female consumers than male [31]. Majority of the consumers who shop online while working prefer credit card as a payment method. Individuals purchasing books/stationary items online give the highest priority to the price of the product, shop sometimes, and examine the service quality issues by in-stock information presented on the web site. Most of the users who sometimes shop online prefer purchasing products priced between 0 and 300 Turkish Liras.

## 6. Conclusion

It is an important issue to understand the consumer behaviour in the e-commerce environment. This study aims to discover the tendency of the Turkish consumers in the e-commerce activities. A questionnaire was applied to the correspondents. Several rules were produced through the GRI method. The content of the rules show us that using e-commerce environment is highly correlated with the education, gender, marital status, monthly income, and age.

The findings obtained from this research show some important contributions for the management of e-commerce companies. In

particular, an in-depth understanding of the online purchasing process could be quite useful for determining those strategies and actions that better fit customers' preferences and demands. It could also support online retailers to attract new customers and win current customers' loyalty while increasing the market share. Online intermediaries should be aware of the existence of relevant differences in online purchasing behaviour according to consumers' socio-demographic characteristics. New programming capabilities should be used to customize the suggested products to specific users from different demographic backgrounds.

This research provides an insight to the practitioners in understanding the consumer behaviour at online environments. Our research also fills the knowledge gap on online consumer behaviour in Turkey as a developing country. There is still a huge market opportunity in Turkey. This research is useful to identify potential customers for e-commerce and their behavioural patterns, forecast consumer's expenditure trends, determine consumer segmentations, and provide personalized services to individuals.

Commercial decisions by consumers must be based on commercial variables including the attributes of the system and shopping channel with respect to the other options. As a further research, it is crucial to understand the barriers and drivers for B2C consumers for the continuous development of e-commerce in developing countries. A new research opportunity has gained interest to study mobile content with the introduction of mobile devices.

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