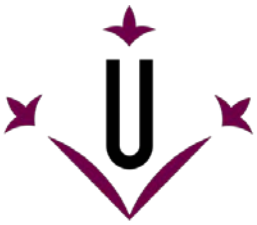

BEHAVIORAL ANALYSIS OF SUBJECTS INTERACTING WITH INFORMATION AND COMMUNICATION TECHNOLOGIES: CATEGORIZING THE BEHAVIOR OF ONLINE CONSUMERS

ABSTRACT

In traditional marketing research, market segmentation has been often used to categorize consumer behavior. However, this approach has been seldom used to study consumer behavior when using Information and Communication Technologies (ICTs) in general and the Internet in particular. Based on a sample of 700 subjects, this research proposes segmenting Internet users by applying a factor and cluster analysis to divide users among three groups, based on the main reported intended uses of a wide range of Internet applications and tools in the near future. In combination, with demographic information and expected Internet usage, a different profile for each segment is designed. This analysis also allows for the extraction of the main factors measuring attitudes vis-à-vis Internet usage. Reflections on the segments, their implications for business management, and proposals for future research avenues are presented in the conclusions section.

KEYWORDS: ICTs (Information and Communication Technologies), segmentation, positioning, consumer behavior, Internet

1. INTRODUCTION

The overarching goal of this paper is to analyze and categorize the behaviors exhibited by users of Information and Communication Technologies, based on the main intended uses of the Internet in the near future reported by the studied subjects. The progressive consolidation of ICT usage, in particular via personal computers and a wide range of terminals enabling Internet access, has made possible to advance our knowledge of both the motivations and the fears of Internet users. Given the fact that millions already regularly use the Internet, and considering the increasing volume of commercial transactions taking place in virtual environments, it is necessary to delve further into the attitudes of these users. Not all of them access the Internet with the same frequency, nor search for and purchase the same goods and services when online. However, distributing Internet users in highly homogeneous groups on the basis of their personal and socioeconomic profile, while also considering how they use the Internet, is no easy task.

The emergence of the Internet and the development of ICTs has brought major changes in the society and in entrepreneurial structures, giving birth to the so-called information society, considered a new social paradigm offering major opportunities tied to the fact that most people are increasingly connected to telecommunication systems, most prominently the Internet, via multiple electronic devices (Banegas, 2001; Laudon and Traver, 2011; Molla and Heeks, 2007).

This new paradigm exponentially increases the possibility to access information and, more importantly, to share knowledge. All human activity spheres, both at the social and the economic levels, are affected by these new possibilities, the ultimate expression of globalization, modernity and progress (Avgerou, 2008; Suárez, 2001).

We can find studies whose main goal is to find the factors behind the adoption and use of ICTs in general and the Internet in particular (Chang et al., 2005; Rodríguez-Ardura et al., 2008; Rodríguez and Meseguer, 2010). Based on the findings of their research, Rodgers and Sheldon (2002) assert that the four main motives behind Internet use are searching for information, communicating with others, browsing and acquiring goods. However, in their paper they also point out that consumers assign their resources according to how they use the Internet. Lin et al. (2004) explored the factors for success in order to optimize market segmentation. Their findings revealed six factors: statistical analysis, a good segmentation plan, application of results, SWOT analysis, assignment of sufficient resources, and communication. The goal of the present paper is to empirically identify the relevant user segments and to reveal their corresponding profiles and features.

Market segmentation based on perspectives of use can be employed to identify and classify customer groups and to provide a clear understanding of each segment, both in terms of motives and regarding to needs and features (Swinyard and Smith, 2003). This information can give companies a clear strategic advantage over their competitors, as it will facilitate the identification of the attitudes and needs of each segment. Consequently, strategic opportunities can be handily converted into effective action plans (Dibb et al., 2002). Company management can employ this segmentation approach based on the expected uses of the Internet to elaborate an optimized classification of its customer base, and therefore design more effective marketing actions. This paper is divided into the following sections. Following this introductory section, existing literature on the topic of market segmentation in virtual environments is reviewed. Details on data collection and analysis are provided in the methodology section. Next, the main findings of the research are discussed, describing each one of the designed segments and mapping them according to their positioning. Finally, a section presenting the conclusions and implications of this research, both for academia and business administration, is also included.

2. MARKET SEGMENTATION IN VIRTUAL ENVIRONMENTS

The importance of market segmentation is widely accepted and has been extensively studied for many decades (Waldo, 1973). Numerous statistical techniques have been applied in the field of market segmentation in all kinds of sectors, including in virtual environments (Cristóbal and Marimon, 2007; Cristóbal et al., 2011; Kau et al. 2003; Vellido et al., 1999). Despite the fact that some authors report several problems in the conceptualization and development of the market segmentation (Dibb and Simkin, 2009; Dolcinar and Lazarevski, 2009), it is a central topic in marketing research, both at the theoretical and the practical levels.

There is still much to be studied and covered in the field of Internet market segmentation. Most research projects undertaken in an initial stage focused on determining the segmentation variables and defining models of market segmentation in virtual environments. Along these lines, we can highlight the work of Gordon and Lima-Turner (1997) and Vellido et al. (1999), who attempted to discover segmentation variables by using neural network methodology. McDonald (1996) applied a motivational framework to transnational market segmentation. Thomsen (1996) highlighted a series of relevant variables for online market segmentation: gender, educational attainment, income level and frequency of Internet use.

Demographic factors have been traditionally related with use levels, both of ICT in general and the Internet in particular. For instance, Mostafa (2006) points to a positive relationship between the education variable and Internet use level, contrarily to the age variable, which has a negative impact on Internet use. Eastman and Iyer (2004) assert that age is an important explanatory factor of user attitudes vis-à-vis the Internet. Focusing on online shopping, Vijayasarathy (2003) points out that age, gender and income level are relevant explanatory factors. Finally, a reference study of the socio-demographic profile of Spanish Internet users, conducted by ONTSI in 2013 and based on data from the National Statistical Institute (INE), found up to six differentiated profiles, which could be grouped according to the percentage of Internet users within each group:

- Profile 1: individuals aged 16-24 that have completed the first half of secondary education and reside in towns and cities of over 50,000. 98.4% of them are Internet users.
- Profile 2: individuals younger than 45 holding a university degree and currently employed or studying. 98.4% of them are Internet users.
- Profile 3: individuals aged 16-24 that have completed the second half of secondary education. 98.3% of them are Internet users.
- Profile 4: individuals with no academic qualifications. Only 1.9% of them are Internet users.
- Profile 5: individuals over 65 with complete primary education. 6.3% of them are Internet users.
- Profile 6: individuals aged 55-64 that have completed the second half of secondary education and reside in towns and villages of less than 10,000. 10.5% of them are Internet users.

The findings of the research conducted by ONTSI (2013) show that online activities of profiles nos. 1 and 3 were mostly linked to using social networks, downloading games, images or music, and uploading content; contrarily, individuals belonging to profile no. 2 tended to read news online, plan and organize trips using the Internet and perform online banking operations. On the other hand, those pertaining to profiles showing inferior Internet use also had less ICT-related equipment in their homes.

It is therefore clear that not only demographic variables can influence the behavior of Internet users. McElroy et al. (2007) assert that psychological and personality traits also have an effect on Internet usage. Based on these variables, Aljukhadar and Senecal (2011) classify Internet users in three groups: those using the Internet primarily to communicate with others; those surfing the net and buying assiduously; and those that used the Internet as a tool for social advancement and to build new relationships and boost existing ones. Enterprises have also been typified in five groups according to their use of the Internet: E-merchants, Information seekers, E-purchasers, E-transaction adopters and WWW experimentalists (Papastathopoulou and Avlonitis, 2009).

The present paper aims at complementing existing research in the field by performing an empirical segmentation study and analyzing the profiles of online consumers in their expected uses of the Internet.

3. OBJECTIVES AND METHODOLOGY

This paper has two overarching goal. The first is to study and classify the behavior of online consumers according to their attitudes regarding the use of a personal computer. The second is to investigate which are the main uses individuals pertaining to the identified segments make of ICT elements.

In order to achieve these goals, survey data from a periodic representative survey taken in the city of Lleida, Spain, were used. This survey takes place every two years, and it was held for the fifth occasion in 2011. Selected inhabitants respond over the phone to a comprehensive survey, whose stated goal is to know, on the one hand, the degree and level of Internet use and, on the other, how each member of the family unit mostly uses ICTs. They are complemented with questions on the personal and social profile of the person responding to the survey and his/her family members.

After obtaining the relevant questionnaire data, we considered one of the questions, aimed at gauging the attitude of the respondents on how they planned to use the Internet in the near future. Based on the results obtained, a multivariate analysis was performed in order to determine a typology of users or, seen from a different perspective, to segment the market. The application of factor analysis has made it possible to select the most relevant information contained in the survey data, in particular that related to the most highly valued activities when using a personal computer. Based on these results, individuals were grouped according to their expected behavior when using the Internet.

General futures of the sample are shown on Table 1, where it can also be observed that the total number of valid answers was 700, for a sampling error of 3.77% for an infinite population.

Table 1. Summary of the sampling technique

Population	Individuals and households in the city of Lleida
Sample	700 surveys with a 3.77% margin of error ±and a 95.5% confidence level (k=2 and P=Q=50%)
Procedure	Stratified random sample
Date of the field work	February - March 2011
Administration of the survey	Personal interview via telephone using a semi-structured questionnaire
Collected information	Collected information can be divided in three major blocks. The first one refers to the equipment present in the household (computers, Internet connection, mobile telephones, televisions, etc.). The second set of questions focuses on aspects related both to the personality of the interviewee and to his/her use of the ICTs he/she has at his/her disposal, with special emphasis on Internet use. Finally, the third block of questions focuses on the key socio-economic variables of the household.

4. SEGMENTATION OF ONLINE CONSUMERS

With the goal of distributing respondents (i.e. users of ICTs) in homogeneous segments, a K-means cluster analysis was performed (Gutiérrez Arranz and Lévy, 2004; Huang, 1998). In order to do that, the survey question in which the respondent was asked to rate from 1 to 10 the possibility of engaging in certain activities with his/her computer was taken as the reference point (see Table 2). Once the segmentation process was completed, a factor analysis was applied to the items shown in Table 2, in order to define the dimensions of the various activities liable of being performed while using the computer. Finally, all segments were positioned vis-à-vis the factors obtained in the factor analysis.

Previous to that, a hierarchical analysis was undertaken, which indicated a natural division into three groups (see Graph 1). Next, the cluster analysis was performed, forcing the extraction of three segments. The result, therefore, were three segments with different sizes: a first group composed of 136 individuals and two bigger groups, with 203 and 220 individuals respectively. The centers of the three final clusters were 6.88 for the first segment, 2.14 for the second and 4.63 for the third. These values show a certain difference in attitudes vis-à-vis expected Internet uses. Additionally, an analysis of variance (ANOVA) of the clusters was performed to further confirm the validity of the results, giving the Snedecor's F distribution values of 846.03, 368.37 and 243.68 respectively, with a 0.0 significance level in all three factors. Therefore, future perspectives of Internet use are clearly differenced according to the segment to which the user belongs.

Graph 1. Hierarchical analysis

Features common to all three segments were encountered. For instance, the three groups show a high degree of penetration of personal computers in the surveyed households, with rates over 90% in all of them and reaching 98.5% in the case of the first segment. A similar trend is detected when observing the penetration of the Internet in the households. These results can be explained by the fact that the segmentation technique is based on future uses of the (Internet-connected) computer. In any case, the goal of this research is to know the user profiles of online environments.

Almost 84% of sample respondents assert having a computer at home. It must be pointed out that this average is higher to the one found in surveys pertaining to other areas. According to Eurostat (2013), there is at least one computer in 78% of all EU-27 households. National and regional data show very similar trends. INE (2013) data shows that 73.4% of Spanish households have some kind of computer system, while Idescat, the Statistical Institute of Catalonia, shows that 75.7% of Catalan households had computer equipment in 2013.

A majority of respondents also declare having extensive experience in using a computer, as 56% of them assert having had a computer for more than 10 years. In addition to that, most respondents have an Internet connection at home (80.5% of them), and a significant number of those who do not yet have one are thinking about contracting it in the near future (12.7% of them asserts having the intention of contracting an Internet connection in the coming 6 months). When comparing these results with those obtained in other surveys, we see that 76% of the European households (Eurostat, 2013), 69.8% of Spanish households (INE, 2013) and

71.5% of Catalan households (Idescat, 2013) are connected to the Internet. These results are in line with those found in the present research.

Table 2. Reference question on user attitudes vis-à-vis future uses of their computer

Thinking about the near future, please indicate how probable it is that you personally perform the following activities using a computer, with a score of 1 indicating a low degree of probability and a score of 10 indicating a very high degree of probability.
- Requesting documentation to a public administration (registration, census, work record, tax receipts, etc.) - Performing banking operations (checking the balance, making money transfers, etc.) - Submitting the income tax return - Shopping for everyday needs (food, cleaning products, etc.) - Buying tech devices (mobile telephones, computers, cameras, etc.) - Buying CDs or books - Filling a complaint - Getting tickets for the cinema, theater or other events - Seeing art collections of famous museums - Contacting with a political representative and/or participating in political debates - Following an online training course - Consulting a physician on a health issue - Reading the daily news, magazines or other publications or documents - Preparing a trip: making the necessary reservations, obtaining relevant information about the places to visit, etc. - Job hunting - Checking the listings for TV channels - Downloading movies or music - Looking for new friendship and romantic relationships (forums, chats, instant messaging, social networks, etc.) - Playing online games - Offering professional services (online working) - Selling stuff - Joining a social network

The most common access method in Lleida is a DSL connection (87.7% of the total), significantly above the average rate in Spain (66.7%) or the EU (73%) as a whole. Those responding to the studied question can also be considered experienced Internet users, as 3 out of 4 respondents assert having more than three years' experience in the World Wide Web. Moreover, they can be seen as heavy Internet users, as almost 80% among them assert accessing the Internet on a daily basis.

The average Internet user connects to the net via his or her personal computer, either a laptop or a desktop. Access using other devices is marginal, except in the case of mobile phones, with 17% of Internet users employing it to access online contents. They mostly go online looking for information (surfing the net through the World Wide Web) and to check their email. Additionally, uses such as file sharing, fulfilling administrative obligations and instant messaging are also popular. For instance, up to 52.4% of them assert owning an account in at least one social network. At the national level, this figure rises up to 68.4% of Internet users (ONTSI, 2011).

Regarding e-commerce, 51.5% of respondents assert having made at least one purchase online, and a further 18.4% has never bought anything online, but has collected information to make a purchase using the Internet. Those that buy online do not usually spend high sums in their Internet purchases. Only 34.9% of those responding affirmatively to this question assert having purchased items for a value in excess of €500 (in the last year). Most payments are made via a credit or debit card (72.3%), with cash on delivery being the second most popular option (11.6%). According to the data offered by ONTSI (2011), 50.7% of Spanish Internet users assert having made online purchases, with an average expenditure of €828 – i.e. results that closely match those obtained in the Lleida survey.

Most respondents also have an email address for private use. However, few have a personal website (3.4%) or a blog (12.2%). According to AIMC data from 2013, 15.4% of Internet users have a personal website and up to 22.5% consider themselves active bloggers.

Graph 2 shows the average scores obtained, on a scale from 1 to 10. We can see how the three segments show differentiated behavior concerning future computer and Internet uses. While users in segment 1 are very active, indicating a high probability of engaging in the described activities, users in segment 2 show a much higher degree of reluctance. Meanwhile, users in segment 3 take intermediate positions.

Graph 2. Attitudes of each segment concerning computer use

Next, we will describe each of the three detected segments.

4.1. Segment-based analysis

The first segment groups a full 45.9% of sample respondents. Virtually all households included in this segment own some computer equipment (98.5%). It is also the segment with more computers available (more than 30% of them assert having 3 or more computers), including laptops (82.2%) and tablets (11.9%). The second segment represents 29% of the total sample and, despite the fact that a computer is present in 90% of those households, computer presence and the average ownership of electronic equipment among family members are the lowest among the three groups. The third segment is slightly wider, representing up to 31.4% of the sample, and occupies an intermediate position in terms of computer presence in the household.

Users belonging to the first group use their computers on a daily basis (91.9%) and do it mostly from home, both for personal and professional needs. They also tend to have specific training in computer use: over two thirds (67.6%) of them assert having taken computer courses. Regarding these two aspects, individuals pertaining to the third group follow them closely. However, those belonging to the second segment are at much greater distance, as only 63.4% among them go online on a daily basis, and just over 40% of them have received computer-related training.

Segment 1, moreover, is overwhelmingly composed of subjects that have Internet connection at home (97.8%), that consider themselves experienced Internet users (81.6% of them have

been surfing the net for at least three years) and who are heavy users of the World Wide Web (93.4% of them goes online on a daily basis). Together with the individuals making up segment 3, they use the Internet both for personal and professional reasons, and mainly to look for information and to send and receive e-mails. Contrarily, users belonging to segment 2 are less experienced and use the Internet less frequently (only 63.4% among them go online on a daily basis).

As we can see in Table 3, individuals belonging to the first segment are highly familiar with the online environment and their reasons to use the Internet often include leisure, study, job search or online shopping activities. In contrast, segment 2 users are those further away from participating in such online activities, as they primarily use the Internet to surf the web and look for information, falling far behind in other areas. Finally, the third segment occupies an intermediate position, shining in more 'serious' activities, such as completing administrative procedures online or visiting the city council website, and falling behind users in the first segment as far as leisurely activities are concerned.

Table 3. Reasons behind Internet use

	Segment 1	Segment 2	Segment 3
Looking for information on products and services	95.6	85.1	93.2
Reading news	86.8	44.3	80.5
Downloading music or movies	64.7	17.9	26.4
Downloading software	52.2	10	27.3
Playing online games	32.4	19.9	11.8
Making personal contacts	65.4	43.3	45
Performing banking operations	61.8	20.4	62.3
Performing administrative procedures	64	18.9	72.3
Taking online courses	34.6	6	27.3
Study help	61.8	38.8	31.4
Job hunting	42.6	8	19.5
Looking for places where to buy certain products or services outside the Internet	81.6	26.9	71.4
Comparing Internet prices and shops	83.8	26.4	66.4
Purchasing products or services	78.7	19.4	58.6
Visiting the website of the local city council	71.3	36.3	74.1
Looking for health information	60.3	25.4	57.7
Other	0.7	3	1.4

Members of the first segment are the ones which are more often connected to social networks: over 86% of them stated having at least one social network account, with Facebook being the most popular option. The remainder segments follow them at considerable distance, both with a rate of social network participation hovering around 40%.

Members of the first group are also heavy online buyers. As shown in Table 4, up to 78.7% of them shop online. They are followed by those users belonging to segment 3, with 64.5% reporting this online activity, with those on the second segment falling far behind – a trend

that is repeated when it comes to using the Internet to obtain information on a product or service before purchasing it.

Table 4. E-commerce

	Segment 1	Segment 2	Segment 3
I have purchased something online	78.7	22.5	64.5
I have not bought anything, but I have used the Internet to inform myself	13.2	20.5	19.5
I have not bought anything and I have not looked for information online	8.1	57	15.9

The most commonly acquired products and services in all three segments are those related to tourism, in particular travel tickets and accommodation. Other categories of products that are often acquired online include tickets for shows (segments 1 and 3), electronics and clothing, shoes and accessories (only segment 1). The most common reasons for making online purchases across all three segments are convenience and variety. They also coincide on the greatest drawbacks they see: excessive advertising and spam. Overall, yearly expenditure in online purchases is rather limited. The third segment is the one showing a higher expenditure level (21.9% of them assert having spent over €1,000 during the last year), followed by the first segment (16.5%) and the second segment (9.3%). Most payments across all three segments are performed with a debit or a credit card.

Table 5. Categories of products purchased online

	Segment 1	Segment 2	Segment 3
Travel tickets	75.7	64.4	73.9
Package holidays	37.4	28.9	39.4
Accommodation	66.4	51.1	67.6
Car rental	17.8	11.1	19.0
Books	30.8	17.8	26.8
Movies	17.8	4.4	10.6
Music	23.4	4.4	12
Tickets for shows	60.7	26.7	55.6
Art and collections	7.5	2.2	7.0
Software applications	20.6	6.7	17.6
Hardware equipment	26.2	4.4	14.1
Video games and gaming systems	15.9	6.7	7.7
Electronic devices	41.1	15.6	21.1
VoIP and Internet telephony services	6.5	2.2	6.3
Ring tones, icons or games downloaded via mobile phone	4.7	-	2.1
Gifts and flowers	14.0	-	11.3
Health and beauty products	12.1	-	6.3
Clothing, shoes and accessories	46.7	22.2	30.3
Food and drinks	15.9	11.1	21.8

Cleaning, personal hygiene or other drugstore products	8.4	8.9	14.8
Financial products or services	4.7	2.2	5.6
Cars, motorbikes, bicycles and related accessories	4.7	6.7	5.6
Real estate	0.9	-	-
Other	0.9	2.2	2.1

When asked how long they have been buying online, members of the third group are those showing greater experience, with 61.4% of them asserting having purchased something online for the first time three or more years ago. They are closely followed by those pertaining to segment 1 (56.1%), with the second segment falling far behind (35.6%). Another factor indicating how involved a given user is with the online environment is whether he/she has a personal blog or website. In this case, and also along the lines of the previous findings, Internet users belonging to the first segment are more active than their counterparts. 8.1% of them assert having a personal website, a percentage that rises to 17.6% in the case of a blog. The results obtained in the remaining two segments were quite similar: around 3% of these users asserted having a personal website, and 11% write in a blog.

On the issue of ICT equipment present in the household, the first group is, once more, above the rest for most devices. Households belonging to the second group occupy the last position. We can therefore assert that users of segment 1 are heavily oriented towards audiovisual content and devices.

Table 6. ICT equipment per segment

	Segment 1	**Segment 2**	**Segment 3**
Television	99.3	98.5	99.5
Landline phone	98.5	98.5	99.5
Mobile phone	99.3	99.0	100
Parabolic antenna	27.2	20.5	22.4
Pay TV	31.6	18.9	24.1
DVD player	84.6	83.7	91.4
VCR	44.1	32	41.8
CD player	63.4	35.3	60.7
MP3/MP4 player	77.9	43.8	63.2
DVD recorder with hard drive	41.2	11.4	32.4
Multimedia hard drive	43.4	21.0	31.8
Video game console	55.9	45.8	47.5
Electronic agenda (PDA)	15.4	5.9	15.1
Digital camera	94.1	75.9	90.5
Digital video camera	52.2	32	42.7
Hi-fi	67.6	42.9	69.1
Home cinema	20.6	8.4	19.1
E-book reader	5.9	1.0	3.2
Tablet	14.7	4.4	8.2

GPS car navigation system	45.6	19.7	42.3

Regarding socio-demographic features, the first segment is mostly made of men (70.6%) and young people (60.3% are younger than 35, and 36.8% are younger than 25) who have an intermediate or high level of education (39% of them have a secondary school diploma, and a further 37.5% has college education) and occupy the second place in terms of net income. Concerning their future attitudes towards Internet use, they mostly show interest in using it to prepare trips (8.8%), reading online news (8.5%) and buying tickets (8.4%). On the other hand, the less plausible options for them are using the Internet to contact political representatives (4.6%) and playing online games (4.8%). Individuals making up this first segment can be dubbed the *Multimedia generation*, i.e. young people that use computers and the Internet mostly in their leisure time and for their personal relationships.

In the second segment, we find a majority of women (56.7%) and more mature people (45.3% of them are older than 45) who have a lower level of education (29.6% only have a primary school diploma, and 7.4% of them have completed no formal education) and have a below-average income level. Their expectations of future Internet use are also remarkably below average, with reading the press online being the most common choice at just 4.2%. Results drop off in the remaining items, reaching absolute lows in plans to shop for everyday needs (1.3%) and to buy CDs or books (1.2%) online. We could label this segment as the *Excluded*, and it is composed of mature people with a low educational attainment and low purchasing power. This group of users presents moderate levels of Internet use.

Finally, segment 3 is made of middle-aged (61.8% of them have between 35 and 54 years of age) men and women with a high educational attainment (53.2% of them have a university degree) and above-average income levels. Regarding their future expectations of Internet use, they show strong interest in requesting documentation to public administrations (8%), performing banking operations (7.3%) and preparing their trips (7.6%). Contrarily, they are less predisposed towards playing online games (1.6%), working online (1.8%) or selling stuff online (1.9%). People belonging to this segment can be labeled as Professionals, i.e. individuals that mostly use the World Wide Web for professional matters, even if they do not completely sideline leisure-related online activities.

5. INTERNET USE EXPECTATIONS

Once the three segments have been identifies, and based on their predisposition to engage in certain online activities in the future via a personal computer, we applied the principal components analysis technique to reduce the number of existing variables (López Delgado et al., 2000). During the calculation stage, we obtained own values, commonalities and a factor matrix. The own values indicate the percentage of variance of the original variables that explain each of the components, the commonality indicates the percentage of variance of each variable that is explained by the components, and the factor matrix shows the correlation between the components of the variables.

The correlations calculated between the variables of this analysis show certain communality in their explanatory capacity. Two tests were carried out on the matrix of correlations: Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure.

The Bartlett statistic, that takes the value of c2 = 1,702.059 with a level of critical significance of 0.000, allows one to reject the null hypothesis of non-correlation between the observed variables. The Bartlett test confirms the existence of linear dependence between variables and justifies the continuity of the procedure. Therefore, it is relevant to apply the factor analysis, in which three factors or components were obtained.[1] These three factors retain 53.7% of the initial dispersion, which represents the correct proportions if we take into account the fact that each of the new components provides independent information which is therefore not repeated.

Table 7. Rotated component matrix

	Factor 1	Factor 2	Factor 3
Getting tickets for shows	.791	.354	.508
Preparing a trip	.781	.308	.465
Requesting documentation to public administrations	.780	.189	.531
Performing banking operations	.778	.218	.413
Filing a complaint	.735	.363	.607
Buying tech devices	.725	.536	.435
Buying CDs or books	.725	.458	.476
Submitting the income tax return	.698	.233	.487
Following an online training course	.655	.296	.641
Shopping for everyday needs	.622	.314	.412
Reading the daily news, magazines or other publications or documents	.588	.251	.559
Selling stuff	.443	.710	.494
Offering professional services	.439	.697	.536
Looking for new friendship and romantic relationships	.102	.695	.082
Playing online games	.142	.689	.189
Joining a social network	.263	.675	.099
Downloading movies or music	.471	.673	.315
Consulting a physician on a health issue	.443	.138	.736
Seeing art collections of famous museums	.509	.217	.717
Contacting with a political representative and/or participating in political debates	.395	.274	.716
Job hunting	.529	.512	.617
Checking the listings for TV channels	.534	.492	.543

With the rotated component matrix shown in Table 7, the weighting of each factor was obtained for each of the variables. The factors that resulted from the analysis were assigned a label and a rating or grade. This rating is the arithmetical average of the items of which it is made up (see Graph 3). Each factor has corresponding variables with high saturations.

[1] In preparing them, the Kaiser criterion was used, so that only factors representing own values greater than the unit are kept.

1. Factor 1, *Practicality*, groups those seeing Internet access as a tool, as a means to buy services or products and for management tasks. This factor is positively correlated with activities such as performing banking operations, submitting the income tax return, requesting documentation to public administrations, shopping online, preparing trips or following online training courses. The average score is 4.97 out of 10.
2. Factor 2, *Socialization*, is defined by aspects related to activities such as being active in a social network, playing online games, looking for friendship and romantic relationships or selling stuff. The average score is 3.3.
3. Factor 3, *Information*, is positively correlated with checking the listings for TV channels, job hunting, visiting the websites of famous museums, contacting with political representatives or looking for medical advice. The average score in this case is 3.9.

All three factors receive a score below 5 (i.e. below the median value of the measured scale), which leads us to conclude that there is still a long way to go in boosting the use of ICTs in general and the personal computer in particular in most households. However, we can also point out that these relatively low values are also due to the fact that the population segment using ICTs the least, the second segment, is quite populous (203 sample respondents), something that tends to reduce median values.

On the other hand, we can also observe that the most highly rated value, in relative terms, is practicality. This means we should primarily focus on this factor in order to motivate potential users: how ICTs can be useful for them and how they can make their lives easier.

Graph 3. Average scores of the three factors

A first non-parametric analysis allows for the detection of behavioral differences among the three segments. The results of the Kruskal-Wallis one-way analysis of variance between the obtained factors and segments allow us to discard the null hypothesis and, therefore, to accept the fact that there are significant behavioral differences among the members of the three studied groups vis-à-vis the three dimensions.

Table 8. Kruskal-Wallis analysis of the obtained segments

	Practicality	Socialization	Information
Chi-square	412.790	261.584	277.129
Degrees of freedom	2	2	2
Significance	.000	.000	.000

a. Kruskal-Wallis analysis
b. Grouping variable: obtained segments

6. POSITIONING OF THE USER SEGMENTS

We finally proceed to situate the three segments obtained with regard to the three factor axes, in order to observe which activities can be done via a personal computer with Internet connection and which are the most highly valued across the segments. This allows us to establish the positioning of the segments with regard to the various factors (see Graphs 4, 5 and 6).

Members of the first segment value the most all aspects related to the three factors, and are therefore located in the upper right side of the diagrams. This position is closely aligned with their profile, as they make up the group of users showing more activity and interest in ICTs. On the opposite side of the spectrum we find the members of the second segment, those valuing the least the activities related to all the factors. Similarly to the previous case, their relative position is also in line with the profile of the individuals belonging to the group: those that are less active and show a higher degree of impermeability vis-à-vis the use of ICTs. The relative positioning of this segment would, however, require an outward shift across all factors of the positioning maps.

Graph 4. Positioning of factors 1 and 2

When observing the remaining segments, we see that segment 3 is mostly positioned in the center-right part of the *Practicality* and *Information* factors. Contrarily, it is clearly to the left of the *Socialization* factor. In other words, individuals making up the second group show great interest in the more practical aspects of the Internet and use ICTs to attain their goals, and not so much for fun or leisure. These traits are directly linked to the main defining feature of this segment: they are experienced users with a more professional profile.

Graph 5. Positioning of factors 2 and 3

Finally, segment 2 occupies a leftward position in respect to all three factors. As we have already discussed, segment positioning is intimately related to the profile of the individuals making up the group; in this case, we are talking about the individuals showing a lesser degree of activity and interaction with ICTs in the sample. On the other hand, when looking at Graph 5, pitting together the *Socialization* and *Information* factors, we can see that segment 1 shines in both and virtually with the same intensity. It must be remembered that this segment is characterized by being made up of young individuals that use their computers both for personal reasons and as an entertainment tool.

Graph 6. Positioning of factors 1 and 3

7. CONCLUSIONS

This paper has put forward a segmentation of Internet users based on the study of the results obtained in an exhaustive survey on ICT implementation in households in general, and on potential Internet uses in particular – which have been used to distribute the users in groups. Three differentiated segments have been obtained: the 'multimedia generation' (consumers that use their computers mostly for leisure and for their personal relationships), the 'excluded' (users with a moderate-to-low rate of Internet use) and the 'professionals' (individuals that mostly go online for professional reasons, even if they do not forget about the leisure possibilities offered by the Internet).

The individuals making up the three groups present a varied demographic profile and much differentiated attitudes concerning their perspectives of Internet use in the near future. However, this information is not enough. Based on these findings, we could conclude that managing a virtual business as if it was a mere extension of a conventional business activity can be a major cause of business failure. Any e-commerce initiative has to be tailored to the realities of the virtual space and to those of the users themselves.

If we analyze the results globally, we see that household penetration of both the Internet and computer equipment is very high across the whole sample. Almost all of them employ a DSL connection and most can be considered experienced users. They mostly use the Internet to look for information and to communicate via email. Over half of them assert having purchased something online, mostly using a credit or a debit card; however, overall expenditure is limited. Virtually all of them have a personal email address, but very few of them have a personal website or a blog.

However, if we focus on the obtained segments, results differ. The first segment is the one with fewer members, but most of them are well-educated young people with a decent income. It is the segment making a more intensive use of ICTs, and they mostly use the Internet for their leisure, to study, to look for jobs or to buy online. The second segment is dominated by older females with a lower educational attainment. It is the segment making a less intensive use of the World Wide Web, and its members mostly go online to surf the net and look for information, falling far behind in all other online activities. The third and final segment is made up of middle-aged subjects, mostly with a college degree and above-average income levels. They use the Internet in a more professional-oriented way, giving a lot of weight to activities such as interacting with public administrations and/or banking entities, in addition to using the Internet as a source of information.

We can extrapolate some practical implications for business management from the findings. The three obtained groups clearly show the lack of homogeneity among Internet users. Therefore, marketing initiatives must be tailored to the needs and expectations of each consumer type. In this case, and based on the positioning maps we have elaborated, the individuals making a more intensive use of the Internet, such as the members of the first segment, value the practicality factor the most – despite considering the information and socialization factors to be also relevant. Therefore, the website must put an emphasis on this aspect: procedures must be simple and user-friendly, finalizing purchases must be straightforward and online payments must be made easy. Contrarily, users belonging to the third segment give a very low value to the socialization factor. Therefore, if a given company wants to target this consumer profile, it does not have to focus on aspects related to this

dimension: online games, institutional profiles in social networks, etc. Finally, the second segment offers ratings well below average in all three factors. More general campaigns promoting the use of ICTs and the Internet would be needed for this group, both by private companies and public agencies.

Before finishing this section, we would like to highlight the main limitations of this project and possible future research avenues. The main limitation of this study is the fact that only users from a very limited geographical area have been analyzed. The reason behind this is our close cooperation with the municipal institute of information technology of the city of Lleida, which has greatly simplified our fieldwork. It would therefore be interesting if future research expanded the covered range to other geographical areas, as this would also raise the number of answers and, consequently, offer even more reliable results. We could even envision a research project using data from third countries and focusing on the role and influence that national culture and features can have on the market segmentation process. As far as we are concerned, we not only expect to keep analyzing future perspectives of Internet use, but also to study various industries based upon user perceptions of the services they receive via the Internet. Finally, it must be pointed out that developing theoretical aspects linked to the findings of this research would be an especially valuable line of inquiry. For example, the factors leading Internet users to become more active or more social and their relationship with e-commerce could be studied. In addition, the factors that can motivate a user to move from one segment to another should also be studied. All of this could become an extension of the inquiry line pioneered in this paper.