

# USERS' PERSONALITY TRAITS IN THE CONTEXT OF VIRTUAL REALITY

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**Abstract:** The purpose of using the internet has been thoroughly studied in the context of "traditional" web. This exploratory study aims to illustrate the profile of users visiting Virtual Worlds (VWs) through the Web. The findings confirm VWs' social origin and highlight entertainment as one of the most attractive purposes of entering to this virtual world. The study also contributes to our understanding of virtual reality retailing dynamics and sets the further research agenda.

## 1 INTRODUCTION

In Virtual Worlds (VWs), users from all over the world can interact within a rich multimedia three-dimensional environment. Participants in these worlds can engage in socialization, information search, entertainment, education, and e-commerce activities. In order to better understand user behaviour in the context of VWs, the objective of the present study is to profile user behaviour in this emerging electronic environment through an empirical investigation of user preferences.

## 2 LITERATURE REVIEW

### 2.1 Virtual Reality Dynamics

Social Networking has been the precursor of VWs (Messinger, Stroulia, Lyons, Bone, Niu, Smirnov, and Perelgut, 2009). The first social networking application has been SixDegrees.com that was launched in 1997 (Boyd and Ellison, 2007). Thereinafter, numerous other social web sites and applications followed, such as Twitter, MSN, YouTube and Facebook, adopting several Web 2.0 or 2.5 applications. No matter what their orientation is, the social aspect has been the common denominator.

These platforms are technology enabled to facilitate various business activities and

opportunities. Virtual teams can work together in the development of new products, attend virtual meetings from their desk, test new products in a manipulated environment under low risk, or be trained to a new position. The flexibility of collaboration coupled with the highly vivid interfaces help them mimic real world activities.

### 2.2 User/Consumer Behaviour

The common interests of the members of a virtual community form and shape that community (Porter, 2004). Similarly, in the virtual reality context, there are VWs such as Second Life that induce users to be part of activities and behaviour that are unusual or do not exist in real life, and other that support members to retain and increase real life behaviour and social activities (Messinger et al. 2009).

According to Bellman, Lohse and Johnson (1999, p.37), "the most important information for predicting online shopping habits are measures of past behaviour". Along these lines, O'Keefe, Cole, Chau, Massey, Montoya-Weiss and Perry (2000) demonstrated that there are considerable differences in the purpose of using the Internet between different groups of subjects. In order to measure the "Purpose of Internet Use", they used four constructs; social communication, E-Commerce, information search and hobby. These constructs form the basis for our empirical investigation in the present paper.

### 3 RESEARCH OBJECTIVES AND METHODOLOGY

An exploratory quantitative research was considered as the most appropriate approach to address the aforementioned goals. To that end, an electronic questionnaire was developed and served as the data collection instrument of the study. Data were collected through groups on Facebook that are fans of VWs and from questionnaires distributed in Second Life. 104 valid responses were collected. (See Krasnikoulakis, Vrechopoulos and Pouloudi (2010) for further details on the research methodology of the present research).

Employing the "Purpose of Internet Use" construct discussed in section 2 (O' Keefe et al. 2000), it was first attempted to segment the sample according to the construct that each subject classified to. The sample was segmented into three groups. Specifically, the first group, labelled "Social Communication", involves users that visit VWs to satisfy their social needs only. The second group labelled "E-Commerce" involves users that visit VWs for e-commerce purposes regardless of any other activities they are engaged in. Finally, the third group involves the remaining users that visit VWs for all purposes except e-commerce. The relevant answers and corresponding segmentation of the sample are summarized in Table 1.

Table 1: Segmentation of groups according to subjects' answers.

Question: What do you usually do in a virtual world?	
Group	Answer
Group #1: "Social Communication" (only)	Meet friends
	Meet new people
Group 2: "E-Commerce" (and other activities)	Shopping
	Sell goods
Group #3: "Hobbies" and/or "Information Search" and/or "Social Communication"	Dancing (Hobby)
	Play games (Hobby)
	Build things (i.e. home furniture, car etc) (Hobby)
	Information search
	Education (Information Search)
	Other

## 4 ANALYSIS OF RESULTS

### 4.1 Demographics

The gender dimension of the participants was split roughly evenly (53,8% being male), while most of the respondents were under 35 years old (81,8%).

Table 2: Demographic characteristics of the sample.

Demographics		N=104 (%)
Age	<18	2,9
	18-25	40,4
	26-35	38,5
	36-50	16,3
	>50	1,9
Gender	Male	53,8
	Female	46,2
Education	High School	19,2
	Undergraduate	26,9
	Graduate	31,8
	Postgraduate	13,5
	PhD	7,7
Nationality	Greek	87,5
	European	10,6
	Australian	1
	American	1
Average income in Euros	0-700	17,3
	701-1100	21,2
	1101-1500	27
	1501-3000	16,3
	>3000	1
	N/A	17,3

At least 65,5% of the population have an average income up to 1500 Euros whereas the majority of the respondents were Greek (87,4%).

### 4.2 Internet Behaviour

The first step for mapping user behaviour has been to record the frequency that each group visited the internet (Table 3). About 46,7% of the respondents that belong in the "Social Communication" group use the internet many times or at least once per day. The corresponding percentage is much greater (82,5%) for "E-Commerce" users (i.e. group #2) and about the same (41,2%) for the third group.

Table 3: Frequency of using the internet.

Frequency(%)	Group #1	Group #2	Group #3
Many times per day	20	30	26,5
At least every day	26,7	52,5	14,7
Sometimes per week	20	12,5	23,5
At least once a week	23,3	5	23,5
Sometimes per month	10	0	11,8

It is probable that someone buys or sells products over the internet but not in a VW and vice versa. The results (Table 4) indicate, however, that a predictable 97,5% of "E-Commerce" users buy

products over the internet. A significant amount (53,3%) of group #1 users buy products over the internet while they are not engaged in shopping activities in VWs. Finally, the same applies to the subjects of the third group (58,9% of them buy products through the Internet).

Table 4: Consuming aspect (buying products through the internet).

Consuming aspect (%)	Group #1	Group #2	Group #3
Yes	53,3	97,5	58,9
No	46,7	2,5	41,1

The frequency of buying products over the internet is summarized in Table 5. Approximately half of the users (50,1%) that visit VWs only for communication purposes, buy products over the internet at least once or twice a month.

Table 5: Frequency of buying products over the internet (responses as a percentage of consumers of the respective groups).

Frequency (%)	Group #1	Group #2	Group #3
Almost every week	18,8	20,5	15
Once or twice a month (approximately)	31,3	41	25
Once or twice in six months (approximately)	37,5	25,6	30
Once or twice a year (approximately)	12,5	7,7	20
Once or twice in the past	0	5,1	10

The corresponding proportion for “E-Commerce” users is greater (61,5%) and for the third group is 40%.

Table 6: Kind of products bought over the internet (responses as a percentage of consumers of the respective groups).

Kind of products(%)	Group #1	Group #2	Group #3
Only tangible	25	38,5	40
Only intangible	6,3	10,3	15
Both tangible and intangible	68,8	51,3	45

Finally (Table 6), regarding the nature of products that users buy, the proportions are lower in intangible products in all groups. Indicatively, only 6,3% of “Social Communication” users buy only

intangible products and the percentages for the other groups are 10,3% and 15%, respectively.

### 4.3 User Behaviour in Virtual Worlds

According to the results presented in Table 7, 83,3% of the “Social Communication” users (group 1) visit VWs at least once a week. The corresponding percentage is greater (92,5%) for “E-Commerce” users and for the third group (76,5%).

Table 7: Frequency of visiting virtual worlds.

Frequency(%)	Group #1	Group #2	Group #3
Never	0	0	5,9
Every day	30	47,5	26,5
Every two days	13,3	37,5	23,5
Once a week	40	7,5	26,5
Once a month	10	7,5	14,7
Once a year	6,7	0	2,9

The following Table (Table 8) highlights the social aspect of VWs. It is noteworthy that the percentage of users of group #1 (13,3%) and #3 (5,9%) that do not visit other social web sites is greater than that of “E-Commerce” users (2,5%).

Table 8: Visit of other social web sites and applications such as Facebook, MSN, MySpace, etc.

Visit of other social Web sites(%)	Group #1	Group #2	Group #3
Yes	86,7	97,5	94,1
No	13,3	2,5	5,9

As part of our study of VW user profiles, we also investigated how the users first learned about the existence of VWs (Table 9). For the first group, most of the users (86,8%) learned about VWs from friends (offline and online) and through e-mails. The same applies to 75% of the respondents of the second group and 70,6% of the third group. It is notable that only 5,9% of the respondents of the third group were informed through scientific articles and journals, while 20% of “E-Commerce” users, randomly.

Table 9: Learning about VWs.

Frequency(%)	Group #1	Group #2	Group #3
friends offline	33,4	20	23,5
friends online	26,7	42,5	32,4
advertisements	3,3	2,5	5,9
e-mail	26,7	12,5	14,7
scientific articles or journals	0	2,5	5,9
randomly	10	20	17,7

The majority of users, especially those of the first two groups seem to embrace the idea that VWs are becoming an emerging alternative retail channel. Nevertheless, approximately one in four (26,5%) of the users of the third group do not (Table 10).

Table 10: Consideration of VWs as an emerging alternative retail channel.

Emerging alternative retail channel(%)	Group #1	Group #2	Group #3
Yes	86,7	92,5	73,5
No	13,3	7,5	26,5

Looking further into the perception of VWs as an e-business outlet, we investigated what types of stores or business users visit in VWs. As users had the ability of choosing more than one option, Table 11 depicts the percentages of users that chose only one option and the percentage of users that chose more than one option (combination). The findings show that 33,3%, 15% and 20,1% of the users within each group respectively (i.e. for groups 1,2 and 3), visit apparel stores only. However, the frequency that the second “E-Commerce” users group visit a combination of the stores, is greater (77,5%) to that of the first “Social Communication” users group.

Table 11: Types of stores/business visited in a VW.

Types of stores/businesses (%)	Group #1	Group #2	Group #3
Apparel	33,3	15	20,1
Hotels	10	0	11,8
Furniture (Home equipment)	6,7	0	2,9
Consulting services for consumers	6,7	5	5,9
Grocery	0	0	0
Non-profit organisations	3,4	2,5	8,8
Combination of the above	39,9	77,5	50,5

## 5 CONCLUSIONS

An important finding of the present study is the great amount of users that conduct e-commerce transactions in the “traditional” Web but do not buy products over the internet in the context of VWs. While this merits further exploration, we posit that it can probably be explained either because users treat VWs as an entertaining or gaming oriented

environment and not as a retailing channel, or because they are considered light users of VWs and are reluctant to commit to transactions in an environment that is deemed unstable.

The origins of VWs in social computing (cf. Messinger et al. 2009; Chittaro and Ranon, 2002) has also been confirmed in the present study: a great percentage (28.8%) of the sample visit VWs only to meet friends or meet new people (social aspect). This was also confirmed by the finding that a great amount of users of all groups (i.e. 86,7%, 97,5%, and 94.1%, respectively) also visit other social networks (i.e. YouTube, Facebook, MSN etc). Therefore, it is important to take this consideration into account when investigating user/consumer behaviour in V-Commerce.

In conclusion, the present study contributes to our understanding of the purpose of VWs use by empirically examining the user behavioural and demographic patterns in the virtual reality context. It demonstrates that both the social aspect and past experience play a significant role in users’ “virtual” decisions and behavioural habits.

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