Attitudes of High Tech Products Users: Optimum Time Space between Successive Versions Released in the Market

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Abstract: *This paper focuses on the specific features of high tech products which might cause difficulties for high tech firms in winning the market. This necessitates the identification of that problems faced by high tech producers. The purpose of the research is to find out which are the main difficulties that consumers experience using high technology products and what is the optimal time space between the current and modified version's appearance from the point of view of ordinary customers. Moreover, this study attempted to find out the gap between perceived and expected quality of the mentioned products. Personal interviews conducted with young people from Greece provided data to investigate mentioned problems using two high tech products i.e. smart phones and laptops. It was found that the majority of respondentsthe majority of respondents change their smart phones every 2-3 years, but expect for new version to appear in about a year and less. It was also discovered that the majority of respondents experience difficulties with the features of the products, especially with big variety of functions and complicated technical characteristics. The findings may also indicate that there are both positive and negative gaps between expected and perceived quality of the products, but the distance between them is still short*
Keywords: *High tech marketing, usage difficulties, optimal time space*

INTRODUCTION

High tech markets have some main features that differentiate them from more traditional markets and make the marketing of high tech products more complicated. Due to the differences that high tech products possess, compared to the traditional products, the marketing of high technologies is vastly different from marketing of consumer products (Yadav et al., 2006). This is why in a lot of high tech companies appear significant problems entering and taking over a market. Reasons of possible failure are emphasized in literature and many of them are deeply analyzed (Rosen et al., 1998). Marketers in high tech industries frequently need to balance product quality and time-to-market. This usually leads to rush to market even at the cost of quality, in order to gain an early advantage by building a target market of users. In this research we focused on two specific high tech products, i.e. smart phones and laptops.

The main goals of this study are:

- To understand how the attitude towards high technology affects consumer purchase behaviour.
- To determine the optimal time space for consumers between their purchase and modified version's appearance (for laptops and smart phones).
- To discover the main features of high tech products (smart phones and laptops) that are difficult for the customers.
- To determine whether there is a gap between the expected and perceived quality of smart phones and laptops from the point of view of the customers.

In the rest of the paper there is a short literature review providing the up to date work done in the framework of consumers' behavior towards high technology products. Secondly, the methodology followed is described. Next, the results and some discussion is made. At this part descriptive statistic and significance tests are provided as well as gap analysis. Finally, some conclusions and limitations of the work are depicted in the last section of the paper.

LITERATURE REVIEW

The review of the literature reveals that one of the most important features of high tech products is that they are developed and replaced at a high rate. The importance of speed in high tech markets is driven by increasing competition and the continually evolving expectations of customers (Doyle and Saunders, 1985). This means that the improvement of existing

technologies happens rapidly (Viardot, E., 2004).As a result of these dynamic market conditions high tech companies frequently rely on a product focus driven by innovations in technology rather than by the needs of the customer (Dugal and Schroeder ,1995). The very rapid introduction of new improved versions can make customers regret for their purchase and delay all new purchases, none of which are in the long-term interest of the producer (Schirtzinger, W.). Another problem in high tech marketing is that technological superiority alone doesn't ensure success for high tech firms, because in most cases high tech products, with a lot of technically advanced parameters created by professionals, are seen incomplete in the minds of ordinary customers (Schirtzinger, W.). Many researches show that customers prefer simpler product functionality and high tech companies that promise "ease of use'' for complex products experience strong reactions from customers (Mohr et al., 2010).

In literature it is also found that demographic variables such as levels of income, socio economic status and education have direct influence on how technology is used amongst specific customer segments (Paul, 2002). Age remains a significant factor influencing the attitude of people towards high technology (Hill et al., 2008).Older customers try new technology only if it meets their specific needs, rather than because of its innovativeness. (Laukkanen et.al., 2007), also they base their purchasing decisions on emotional factors, while younger consumers make decisions based on existing factual, technical information (Wang and Cole, 2008).

Literature review findings also indicate that early adopters of innovative products are younger consumers with higher incomes and education, but unlike education, age and income are directly related to consumer innovativeness and new product adoption (Wang et. al., 2008).

Furthermore, high tech products sales are positively associated with performance of the product. However, despite the importance of product quality, there has been little consideration on perceptual quality as perceived by the user. Perceived quality it considers much more than the performance of the product. It is concerned with the overall experience the user has when purchasing and using provided products. (Papaioannou, et all., 2011). It is very important for the marketers to know their customers' expectations as these expectations influence customers' satisfaction. When expectations are met or exceeded, customers report higher levels of satisfaction (Jones et al., 2003). Thus, it is important to test the customers perceptions (actual experience) to see whether quality of two high tech products met, exceeded or followed the expectations.

METHODOLOGY

The authors used a structured questionnaire and data was collected through personal interviews. The sample consisted of young people in Greece. The sample included in total 200 questionnaires and all of them were used for the purposes of this research. The questionnaire was developed primarily using items from the literature and developing new questions aimed at achieving the main goals of the research. The items were measured by a Likert scale. Demographic variables such as gender, age, education and income were also included.

In order to examine the attitude of the respondents towards high technology and find out whether our sample is technology oriented or not, some variables from the literature were used and modified (Papaioannou et al., 2010) using factor analysis and reliability analysis. These variables are named as "design victim", "technology oriented" and "technology victim" regarding the customers. From the results of factor analysis and reliability analysis were rejected some items and some others remained in the variables. (AS1, AS2, AS3 see appendix I) consisted a design oriented variable. Cronbach's alpha for technology oriented variables (P8-P12 see appendix I) was also at an acceptable level. Reliability analysis of technology victim variables gave a sufficient Chronbach's alpha coefficient as well (SI13, SI14, SI15 see appendix I).

We have used ANOVA test to examine whether there is a relationship between these 3 new variables and some demographic variables. The same test was performed to find out if there are significant relations between the difficulties using smart phones and laptops and some demographic variables. Gap analysis was performed to find out whether there is a significant difference between the expectations and the perceived experience of smart phones and laptops from the point of view of the customers. The variables that were examined measured the level of satisfaction/dissatisfaction with variables regarding the value, aesthetics/design, experience of using, installation and first use experience, after sales service and finally the overall quality of the product.

4. RESULTS AND DISCUSSION

Respondents' socio-economic profile shows that 52% out of the total respondents were females and 48% were males and most of them were Greek students. The age of the majority of the respondents was between 15 and 34 years. In the survey the respondents were asked to respond on issues concerning their attitude towards high technology, difficulties they experience using high tech products, the frequency they want modified versions to appear, etc.

In order to examine the attitude of the respondents towards high technology and find out whether our sample is technology oriented or not, we have used variables from the literature measuring their technology orientation, their design preference and finally whether they are technology victims. The items were adapted to the two products under consideration i.e. laptops and smart-phones as mentioned in a previous section. Using factor analysis and reliability analysis of design variables and

technology orientation variables we concluded on 3 main categories: design oriented (Cronbach's alpha 0.7978), technology oriented (Cronbach's alpha 0.7212) and technology victim customers (Cronbach's alpha 0.8628).

Table 1: Descriptive statistics of new variables

	Minimum	Maximum	Mean	Std. deviation
Technology victim	3.00	15.00	9.0881	2.76087
Technology oriented	5.00	25.00	16.7784	3.56303
Design oriented	3.00	15.00	10.3490	2.22976

Table 1 depicts that in general the majority of our sample is shifted to the upper border of the rage which means that the majority of the respondents has positive attitude towards new technologies. According to the table statistics we can emphasize that the majority of our sample are technology and design oriented customers. The analysis of variance have shown that there is a relationship between these 3 variables and some demographic variables. Results show that, generally, there is no relationship between these variables and the age, gender and household income of the respondents. However, there are some exceptions like a marginal correlation ($p<0.1$) between design victim and the age of respondents as well as technology victim variables and the age of respondents.

Table 2 and Table 3 depict the frequencies concerning the questions how often respondents change their smart phones and laptops and what is their opinion about the optimal time space for new versions to appear.

Table 2: Frequencies the respondents change their smart phones and laptops

	Smart phone (%)	Laptop (%)
Every month	2.8	1.1
Once in a year	22.9	8.6
Every 2-3 years	56.9	38.7
Every 3-5 years	17.4	51.6
Total	100	100

Table 3: Optimal time space frequencies for smart phones and laptops

	Smart phone (%)	Laptop (%)
I want it to appear as soon as possible	7.8	11.9
I need 3-6 months	16.5	9.9
I need about a year	34.0	17.8
I need 2-3 years	31.1	47.5
I want it to appear as late as it's possible	10.7	12.9
Total	100	100

Table 2 depicts that about 57% of respondents change their smart phones every 2-3 years, whereas about 23 % of them buy a new smart phone every year. When asked about their opinion concerning optimal time space between their smart phone purchase and modified version's appearance, about 34% of respondents answered that they need about a year, while about 31% of them need 2-3 years. In the case of laptops it turned out that about the half of respondents change it every 3-5 years and about 39% every 2-3 years. We tried to find out if some demographic variables such as gender, age and household income influence the frequency respondents change their smart phones and laptops. For this purpose we used Chi-square test for each demographic variable. The results of the test show that there is a significant correlation ($p<0.05$) between the frequency respondents change their smart phones and their household income. It seems that respondents with higher household income change their smart phones in shorter time period. We could find a correlation ($p<0.05$) between the gender and optimal time space that they need for new smart phone version's appearance. It turned out that about half of male respondents need modifications to appear in a year and less, while another half of them need more than a year, but the majority of female respondents mentioned that they want modifications to appear in a year and less. Also, there is a marginal correlation ($p<0.1$) between the age of the respondents and both the frequency they change the smart phone and the time space they need for new version's appearance. There is also a significant correlation ($p<0.05$) between the age and the frequency respondents change their laptops. Although the sample wasn't well distributed among age groups, it seems that older customer change their laptops more often that younger customers.

The frequencies of difficulties the respondents experience while using smart phones and laptops are depicted in Table 4.

Table 4: Difficulties using smart phones and laptops

	Smart phone (%)	Laptop (%)
Big variety of functions	72.45	45.36
Sequence incomprehensibility	30.41	18.32
Usage of professional terms	39.69	33.33
Technical characteristics	54.12	46.32
Touch screen use	44.79	-----

It can be seen that the majority of respondents face difficulties with big variety of functions both in smart phones and laptops; also about half of them experience difficulties with technical characteristics of the products. There is no significant correlation between difficulties using smart phones and laptops and gender. However, there is correlation between some kind of difficulties and the age of respondents. So, to be more precise, the difficulties connected with the usage of professional terms in smart phones and sequence incomprehensibility in laptops are correlated with the age of respondents ($p<0.05$). Moreover, there is a marginal correlation ($p<0.1$) between the difficulties with technical characteristics of laptops and the age of respondents. The results show that older respondents experience more difficulties with several features of the products than younger respondents.

4.1 Gap analysis

Gap analysis was performed to find out whether there is a significant difference between the expectations and the perceived experience of smart phones and laptops from the point of view of the customers. The variables that were examined measured the level of satisfaction/dissatisfaction with variables regarding the value, aesthetics/design, experience of using, installation and first use experience, after sales service and finally the overall quality of the product. The maximum negative gap was depicted in the overall quality of smart phones, which means that expected experience was better than the perceived one and significance test revealed that the gap score was statistically significant($p<0.05$).

Table 5: Gap analysis of 6 dimensions measuring perceived and expected experience of smart phones

Examined Dimension	Mean Perceived	Std. Deviation Perceived	Mean Expected	Std. Deviation Expected	Gaps	Sig.
Value for money	3.56	1.157	3.59	1.254	-0.03	0.781
Aesthetics/design	3.89	1.087	3.98	1.099	-0.08	0.279
Experience of using	3.61	1.098	3.47	1.319	0.14	0.188
Installation and first use experience	3.45	1.115	3.38	1.304	0.07	0.452
After sales service	3.33	1.200	3.53	1.226	-0.20	0.028
Overall quality of the product	3.89	0.970	4.14	0.956	-0.25	0.002

Analyzing the gaps between the expected and perceived experience of laptops we see that the maximum negative gap is in after sales service. The significance test also found out that the gap score was statistically significant (sig.<0.05). The maximum positive gap was depicted in value for money variable, which means that the expected experience was better than the perceived one (sig.<0.1).
Although there are both positive and negative gaps existing in different components of customer satisfaction with smart phones and laptops, it is obvious that the distance between expected and perceived satisfaction still remains short.

Table 6: Gap analysis of 6 dimensions measuring perceived and expected experience of laptops.

Examined Dimension	Mean Perceived	Std. Deviation Perceived	Mean Expected	Std. Deviation Expected	Gaps	Sig.
Value for money	3.97	.965	3.82	1.168	0.15	.079
Aesthetics/design	3.93	1.017	3.97	0.038	-0.04	.444
Experience of using	4.03	.897	4.01	1.041	0.02	.765
Installation and first use experience	3.73	1.004	3.68	1.002	0.05	.584
After sales service	3.36	1.270	3.59	1.198	-0.23	.010
Overall quality of the product	3.99	.912	4.03	0.965	-0.04	.643

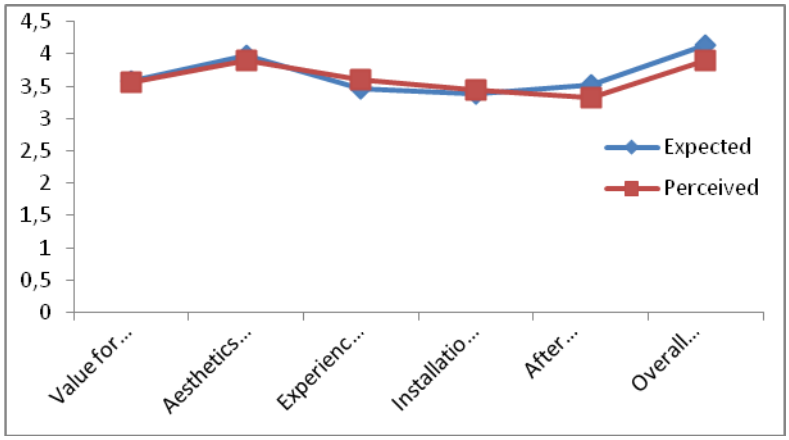

Figure 1: Schematic representation of the gap measurements among perceived and expected satisfaction of smart phones.

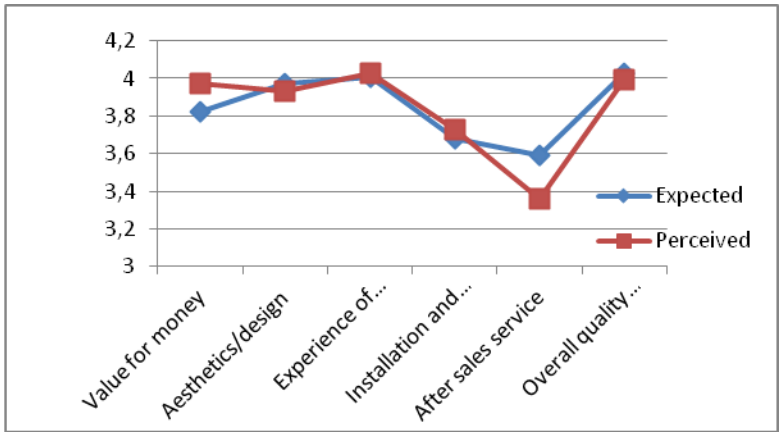

Figure 2: Schematic representation of the gap measurements among perceived and expected satisfaction of laptops.

5. CONCLUSIONS

The main contribution of this paper is to reveal the main difficulties customers experience using smart phones and laptops, in discovering their opinion about the optimal time space for modified versions‘ appearance and the gaps between perceived and expected quality of mentioned products.

According to the findings of the survey, the majority of respondents change their smart phones every 2-3 years, but expect for new version to appear in about a year and less. Additionally, females need shorter time for modification’s appearance than men. In case of laptops about half of respondents change it every 3-5 years, but great majority of them expect modifications to appear in 2-3 years or less. It was also discovered that the majority of respondents experience difficulties with the features of the products, especially with big variety of functions and complicated technical characteristics. Furthermore, it was found that older customers more often experience difficulties using smart phones and laptops than younger customers.

The findings may also indicate that there are both positive and negative gaps between expected and perceived quality of the products, but the distance between them is still short.

As limitations of the paper it could be considered the sample size. It is small regarded as a consumers sample. A sample of not only young people should be the next target, therefore the findings need to be developed and verified in the future using a larger sample including respondents of different age groups.

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Appendix 1

Construct	Variable numbers in questionnaire	Cronbach's alpha
Design oriented		0.7978
My smart phone has an inspired design	AS1	
My smart phone has a productive design	AS2	
My smart phone has marvelous design	AS3	
My smart phone is just beautiful	AS4	
The design of my smart phone is simple	AS5	
The design of my smart phone is not something special, but it is easy to use	AS6	
Easiness in usage is preferable to phone's design	AS7	
Technology oriented		0.8236
I like to experience new technologies	P8	
I lie to discover ways to use things that I buy, in order to obtain a personal opinion for them	P9	
In my family I am the person who discovers the usage of new technologies	P10	
I usually want to find new brands and technologies that will make me unique and pioneer	P11	
Within my friends I'm the person who discovers the usage of new technologies	P12	
Technology victim		0.8628
The usage of new technologies makes me feel relaxed	SI13	
The usage of new technologies makes me feel happy	SI14	
The usage of new technologies makes me feel satisfied	SI15	
People that affect my behavior believe that I should use new technologies	SI16	