University of Patras

Department of mechanical engineering and aeronautics

Evaluating the quality of provided business services in the field of study, installation and network supply

Diploma thesis: Angelou Panagiotis

Supervisor: Malefaki Sonia, Assistant professor

Introduction

In recent years, the increase in the use of the Internet has brought about significant changes in the field of companies-organizations engaged in the study, installation and supply of a network in our country. The internet first appears in Greece in 1990. In 2005, the first ADSL connections appear, which carry high speeds with improved connection. During this period, there is also the most significant increase in demand for the Internet. Over the last ten years, the upward trend has continued mainly due to the increased use of web applications, smartphones and computers. The companies that are active in the field of design, installation and supply of a network are constantly increasing and evolving their technologies to be able to meet the sophisticated needs of their customers.

The main objectives of this diploma thesis are the evaluation of the quality of the services provided by Compugen and the examination of the effect of the basic demographic characteristics on the level of satisfaction of the respondents. All statistical analysis was conducted using the IBM SPSS 27 statistical package and the level of satisfaction of the company's external customers was found, the sectors that outperform and its weak points were identified.

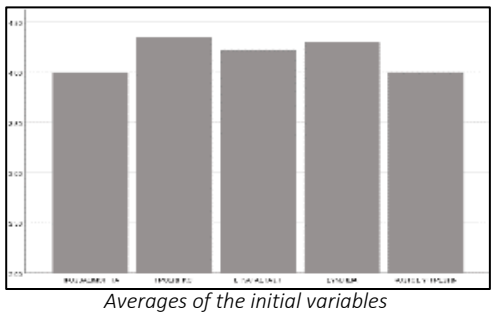
Methodology

For the survey, a specially designed questionnaire was constructed according to the ServQual model (**Parasuraman A., 1985**) which was completed by 120 external customers of the company Compugen. The questionnaires were sent to external customers via e-mail. We initially conducted a pilot survey to check the internal consistency and reliability of the questionnaire. We proceeded to the calculation of the basic descriptive measures (average, standard deviation, maximum and minimum value) for our initial variables. The internal consistency of the questionnaire was then checked through Cronbach's Alpha index and the variables Accessibility, Staff, Installation, Consistency and Cost of Service were constructed. The normality assumption of the new variables was then examined using the Shapiro-Wilk test. The tests carried out are non-parametric as none of the variables under consideration does not come from a normally distributed population. Then we compared the median of the variables using the Friedman test, for more than two dependent samples, and calculated the correlation coefficients of the variables under consideration using Spearman's rho coefficient. As for the difference in the level of satisfaction of the participants in the indicators to be examined in terms of the type of use, the Mann-Whitney test was used, for two independent samples, while for the other demographic characteristics (network location, age, occupation) we used the Kruskal-Wallis test for more than two independent samples. Then, Principal Component Analysis (PCA) was carried out (**Karlis, 2003**) through axis rotation with the varimax method from which we extracted six new components, Installation and Response, Staff and Reliability, Accessibility, Consistency, Service Cost and Security and Service. Three of the six variables formed by the PCA are the same as the original variables while the rest show small differences. Finally, using the K-means algorithm (**Karlis, 2003**) we created two groups of customers based on their level of satisfaction, assigning the most satisfied external customers in one group and the least satisfied in the other one .Also we examined the demographic characteristics of the less satisfied group so that the company can use the data to its advantage and reach out to them differently.

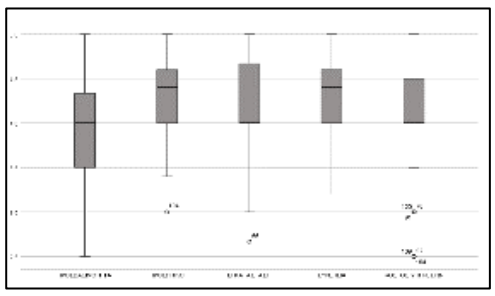
Bibliography

Karlis D., (2003), Multivariable statistical analysis., Athens-May 2003, Athens University of Economics and Business

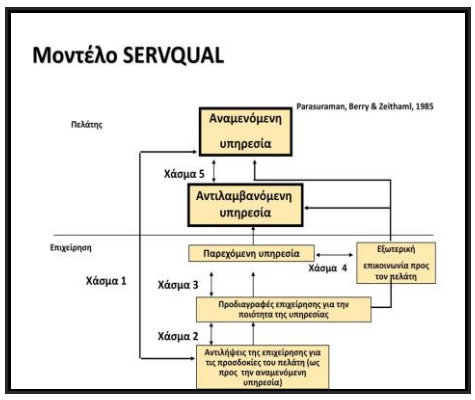
Parasuraman A., Zeithaml V. & Beery L., (1985), A conceptual of service quality and its implications for future research (ServQual), Journal of Marketing, 49:41-50



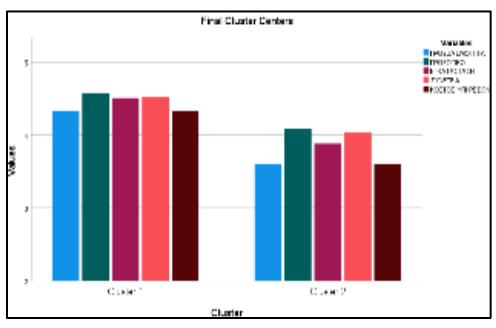
Averages of the initial variables



Box plots of the initial variables



ServQual model



Average level of satisfaction of five quality axes for the two customer groups

Conclusions

- We found higher satisfaction in the sectors in descending order. **Staff**, **Consistency**, **Installation**.
- We found lower satisfaction in the quality axis **Accessibility** and **Cost of services**.
- We observed positive correlations between all variables. The strongest positive correlation was observed between the variables "Accessibility" and "Staff" while the lowest positive correlation was observed between the variables "Cost of services" and "Consistency".
- In terms of occupation and type of use, we did not observe any statistically significant differences in any of the variables under consideration.
- Regarding the age of the participants in the variable "Accessibility" we noticed that the most satisfied are the external customers of the company Compugen who belong to the age group 31 to 40 years, while less satisfied are the participants who belong to the group 66 years and older.
- Regarding the variable "Consistency" we noticed that more satisfaction is expressed by external customers up to 30 years old while less satisfaction is again expressed by customers aged 66 and older.
- Regarding the variable “Staff” we noticed that customers aged up to 30 years old are more satisfied and customers aged 66 and older are less satisfied.
- Regarding the variable "Cost of services" we saw that customers up to 30 years old are more satisfied while customers 66 years and older are less satisfied.
- Regarding the difference in the level of satisfaction of the participants in the indicators to be examined in terms of the place of installation, we observed a statistically significant difference in relation to the variable "Cost of services". Customers who live or have their business in Loutraki, Corinth and Nemea are more satisfied. External customers in the areas of Trikala, Corinthia and Xylokastro declare less satisfaction.
- The comparison of the new components with the original variables showed that three of the six new components also existed during our initial variables. (Accessibility, Consistency, Service Cost)
- The initial variables and the new components behaved similarly in terms of demographic characteristics, occupation and type of use as we did not observe any statistically significant differences. Regarding the age of the participants, the initial variables showed a statistically significant difference in terms of "Accessibility", "Staff", "Consistency" and "Cost of services", while the new components only in "Staff and Reliability". Regarding the place of installation in the initial variables we observed a statistically significant difference in "Cost of services" while in the new components in "Cost of services and in" Security and Service ".
- We observed that external customers belonging to group 1 (cluster 1) are more satisfied than those belonging to group 2 (cluster 2) in all the variables under consideration.
- Finally, we saw that the team with the least satisfaction consists of older customers but also customers who have their business or home in more remote places.

Proposals

- For Compugen, it is considered beneficial to take corrective actions to the business strategy on the factors "Accessibility" and "Cost of services" to enhance them, while to maintain customer satisfaction on the other factors the company needs to demonstrate the corresponding zeal as to the quality of the services it offers.
- The company should pay special attention to the management and approach of older people and through new strategic planning to try to satisfy them more.
- The company is called upon to redefine its pricing policy regarding the services it offers to the most remote places or to provide special privileged packages to these customers with the ultimate goal of satisfying them.
- The company should execute in future a similar survey with different quality indicators in order to examine the services it offers from a different perspective according to the views of its customers and to determine if the business has been strengthened through our research.
- The proper planning of all processes and the preparation of future plans should be carried out focusing on the satisfaction of the external customers and their opinion on the importance of services that ensure quality.