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ANALYSIS OF THE QUEUING LINE MODEL SERVICE SYSTEM: BINGOL UNIVERSITY DINING CENTER EXAMPLE

Sait PATIR^a

Ahmet USLU^b

Abdülkadir UYRUN^c

^aBingöl Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, Bingöl, Türkiye (spatir@bingol.edu.tr)

^bBingöl Üniversitesi, Sosyal Bilimler Meslek Yüksekokulu, Bingöl (ahmetuslu@bingol.edu.tr)

^cSiirt Üniversitesi, Kurtalan Meslek Yüksekokulu, Siirt (auyrun@gmail.com)

EXTENSIVE SUMMARY

Fast food investments differ from restaurants by fast servicing. So expectation of the customers from these investments is to be serviced as fast as possible. The customers of the cafeteria of the universities are generally consisted from students and personals of itself. Since both of the groups have limited time to service, waiting process is getting decrease, and thus it is expected to be serviced in optimum fast level in those investments. While increasing the number of the staffs is enough to decrease demurrage, it will cause more expenditure because of the staff costs. There is an inverse ratio between service providers and demurrage. That is, increasing the number of service providers in order to reduce waiting costs increases service costs while decreasing the number of service providers increases demurrage. Analyses are made with the wait-line model to guide decision makers to balance in a dilemma.

The waiting-line model is an analytical method used to evaluate customer flows in the queuing system, taking advantage of mathematical models and performance measures. With this model, it is possible to optimize waiting problems in service systems.

The data obtained about the university cafeteria system within the scope of the study was analysed with the waiting line model and results were obtained for the decision maker. Scenarios were developed after analysing the existing system so that information about the system was obtained in alternative situations. The data were taken from the Presidency of the Department of Health, Culture and Sports of Bingöl University. The Kolmogorov - Smirnov single sample goodness of fit test was carried out with the SPSS package program to determine the distribution of arrival times taken from the operating system. The system, whose mathematical model was set, was analysed by the WINQSB program.

In the analysis of the existing system, the waiting problem of the students has been high even though the probability of the service providers being vacant is low. In the existing system, efficiency has been achieved and service costs have been minimized. However, Because of long time waiting periods of the students, it has been claimed that alternate systems are required to be endeavoured.

According to the obtained data, the number of channels, which has currently 4 channels, was increased to 5 and then to 6. Even if the providing costs in 5-channel system increased compared to the current system, students' demurrage was reduced significantly. When looked at the total cost, it was seen that it works more effectively than the existing system.

The system, which was designed by increasing the number of channels to 6, increased the probability of vacancy of service units despite the decrease of students' demurrage when compared to both existing system and 5 channel system.

As a result of the performance comparisons, it was determined that the 5-channel cafeteria system design of the university is the best system that achieves the balance between the two opposite states by means of its efficiency in decreasing of students' demurrage although it increases the service costs.