Development of Ideal Campus Settings and Activities
At Dokuz Eylül University Kaynaklar Campus

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Abstract
This paper aims to contribute to the development of the campus life in DEU Kaynaklar Campus by using Modern QFD approach. The customer (students, academicians and administrative staff) needs that are multiple value items such as problems, opportunities, look good and feel good issues about the campus life is determined through surveys, focus group studies and observations gathered from Gemba. Customers’ priorities are extracted by using Analytic Hierarchy Process (AHP) which is one of the most accurate prioritization methods. The Maximum Value table is used to plan the delivery of sufficient expectations on high priority needs of campus people in order to develop an ideal campus that offers an environment to assure their personal and social development.

Keywords: Modern QFD, Analytic Hierarchy Process(AHP), Campus Life, Dokuz Eylul University

Introduction
University is a large and diverse institution of higher learning created to educate for life and for a profession and to grant degrees. The traditional functions of universities are teaching and research. In their teaching activities, universities provide the professional training for high-level jobs, as well as the education necessary for the development of the personality. As its definition indicated, university should maintain the improvement in the lives of the people it serves. This improvement can be obtained when the university has a campus life, which offers opportunities for students in order to contribute to their personal development [3][9] and generate interaction for establishing social networks and raising social competence [7]. As a result, campus life provides unique opportunities for students to positively shape their behaviors.

Dokuz Eylul University (DEU) is a multi-campus University dispersed throughout the city of Izmir at various locations. One of DEU campuses is Kaynaklar Campus that was settled in Buca in 1993. There are four faculties (Engineering, Art – Science, Business and Architecture), one high school (School of Maritime Business and Management), one institute (Institute of Social Sciences), central library, a medical unit, sports saloon, a Problem – Based Learning building, two guest houses for research assistants coming abroad, and a social facility which only gives lunch service for students, academic and administrative personnel in the campus. Today, there are 9043 students including both graduate and undergraduate level in Tinaztepe Campus with 379 administrative and 715 academic personnel.

However, there are some insufficiencies in Kaynaklar Campus due to its new settlement. Present facilities that are being offered to the students cannot meet the expectations from a campus life as mentioned above.

The aim of this study is to contribute to the development of the campus life in DEU Kaynaklar Campus. Modern QFD approach is used to extract the campus stakeholders’ needs and
the ways of the delivery of their sufficient expectations on a campus life that offers an environment to assure their personal and social development.

In the first part of this study, campus life and its effects on personal development in general is described briefly. In the second part, Modern QFD approach is introduced by its outline, and then the implementation steps of this method to develop of an ideal campus setting are given.

Campus Life

Higher education provides academic education and prepares students for the professional life. On the other hand, “acquisition of personal development” is another benefit that is captured during higher education. Both learning and personal development are processes that are also sustainable within the campus life. However, due to the change agents like technology-driven information and communication, globalization, high intensity of competition higher education establishment needs should be reconsidered [12]. Besides, higher education system has to respond with actions and plans to deal with the changes that are stated. As a matter of fact the higher education should prepare the students to the “real world” and to the changes in the “real world” both academically and mentally.

It is assumed that: students of all ages and backgrounds need, enjoy, and expect university to provide them with intellectual challenges; students learn best when they are acknowledged as active learners whose previous knowledge and skills are recognized; for the quality of the student life learning in a social group is vital; university is not just a preparation for life, it should be recognized as a life itself; the main aim of higher education is to contribute to the intellectual independence in students as the basis for lifelong learning [10].

Learning occurs all the time, and direct experience shapes individual learning. Individuals learn by establishing and reworking patterns, relationships and connections and with the stimulating changes in the environment. Hence, higher education leaders should reshape their priorities to include the creation of attractive, engaging campuses that contribute to both activity and tranquility [6].

A campus should imply visually a sense of place, purpose, order and quality; should express a high level of involvement through a thoughtful, effective physical layout that guides the execution of campus functions in a comprehensible, people-serving manner [8]. Campuses should be a center of social interaction and provide informal learning opportunities of other forms by establishing lounges, meeting rooms, cafes, green areas and other attractive open areas for formal interaction and exchange of ideas [12].

Many researches have pointed out the benefits of campus activities for students [1][2][5][15]. Improved interpersonal skills including communication and group organizational skills, a positive influence on skills in leadership, communication, teamwork, organizing, and decision making and planning are some of the benefits of campus wide organizations [5]. Dormitories and other student accommodation facilities within the campus also give students the ability to meet people, live cooperatively, resolve conflicts and improve interpersonal relationships. Additional advantages of the residential experience include greater degrees of active and collaborative learning, more interaction with campus members, and potential for increased interaction with students having different backgrounds, beliefs and culture [4].

Modern QFD

Quality Function Deployment (QFD) is originated in Japan in the late 1960’s. This methodology is first introduced for assuring customer satisfaction by the work of Dr. Mizuno and by Dr. Akao. After gaining strength in Japan in the 1970’s, it is spread to North America in the mid-1980s and Europe in the late 1980’s.

At that time, the best known instrument of QFD was the so-called House of Quality (HoQ). This matrix analyzes customer requirements in detail and translates them into the designers’ language. In some QFD literature and practices consider solely constructing a series of large matrices to be “doing QFD”. This led to the perception of QFD was good, but slow, labor-intensive and in the need of “simplifying”. Thus, in response to feedback from a variety of organizations using QFD in the early 1990’s, Blitz QFD is introduced as a faster, better way to start doing QFD [18]. Blitz QFD is a fresh streamlined way to get the basic benefits of QFD with minimum effort (and no
matrices). From this point, Modern QFD has evolved to reduce development time for modern improvement methodologies such as Lean and Six Sigma [18].

Modern QFD comes from the fundamental parts of traditional QFD. It emphasizes on a tailored QFD process to know where the resources will be most effectively utilized to create value for organization and their customers. Its basics can be outlined as follows:

**Extracting the customer needs**

Customers are satisfied when they receive value. In QFD, value is recognized when customers perceive: (1) a problem of theirs solved or minimized; (2) an opportunity they desire seized, maximized, or enabled; (3) themselves looking good to significant others; or (4) themselves feeling good about themselves [16]. Therefore, value results from solving problems or seizing opportunities. Each customer can have multiple value items such as problems, opportunities, look good and feel good issues with different priorities. These are customer needs. Customer problems are not complaints or problems with the product, and customer opportunities are not product features or solutions. Rather, problems prevent customer from achieving their personal or business goals while opportunities bring advantages different from the competitors. So, customers’ words or behaviors should be analyzed for greater breadth and depth of meaning.

- Gathering the voice of customers (VoC): surveys, content analysis, interviews with customers and visits to the gemba are generally used.
- Analyzing the verbatims: the requirements are obtained from the VoC by analyzing the verbalizations and translating them into customer needs. Since needs are true benefits customer seeks, they can be discovered by asking about the benefit to the customer.
- Structuring the customer needs: the structure shows how customers think about their needs.
- Analyzing customer needs structure: the hierarchy of needs is used for analyzing the set of needs for consistency and completeness and to uncover implied needs that no customer mentioned.

**Prioritization the customer needs**

To know which needs are how important and to whom, the customer needs on the hierarchy should be prioritized. One of the simplest methods for obtaining ratio scale priorities is the Analytic Hierarchy Process (AHP) [14].

**Delivering the value to the customers**

Out of the large number of product features created during development, only a few directly and strongly relate to any high-priority customer needs [17]. There are a small number of items that individually have a very significant effect on the amount of value a customer perceives. Such high-value items are essential to satisfying the customer.

- Deploying prioritized customer needs: the Maximum value is used to plan the delivery of the high priority needs, efficiently. Here, key customer needs are driven forward to the various dimensions of design that must be aligned end-to-end in order to assure customer value.

**Methodology**

The aim of this study is to determine the campus stakeholders’ needs and develop an ideal campus setting based on the implied needs for Dokuz Eylül University Kaynaklar Campus. In order to satisfy the intended objective, Modern QFD approach, outlined above, is used.

**Extracting the customer needs**

**Gathering the VoC**

The customers who will utilize from the campus opportunities are named as stakeholders of the campus which are students, academicians and administrative staff. To collect the VoC, a student, an academician and an administrative staff from each of the five faculties are observed and interviewed in depth. For gathering customer information, two of the co-authors were assigned as one was responsible for interviewing and the other observing and recording the interview. They visited the stakeholders at the bus stops, central library, several canteens, medical center, central facility building consisting of only a dining hall, dormitory allocated to academic personal from outside and sport and documented their actions, words, smiles on a gemba visit table.

**Analyzing the verbatim**
By analyzing the verbalizations and observations, the requirements from the Gemba Visit Table are obtained and then sorted into categories such as characteristics, situations, problems, the customer needs, solutions, design, project and organizational issues. These categories constitute the Customer Voice Table (CVT), shown in Figure 1. In this table, the customer needs were extracted by working back from the solution, design, project and organization columns.

**Structuring the customer needs**

The KJ method is used for producing the natural structure of customers’ requirements. KJ is a non-rational “right brain” method to make visible the way the people think about their needs. For this purpose, a focus group discussion with some of interviewees is conducted. During the focus group, how stakeholders of the campus think about their needs are understood.

**Analyzing customer needs structure**

To analyze consistency and completeness of the hierarchy of needs, two professors in Business Administration Department whose major area is in organizational behavior are consulted. Considering their contributions, the last version of the hierarchy of needs, shown in Figure 2, is determined referring to ERG theory. This theory is based on Maslow’s need hierarchy; however it is revised and classified into three groups –existence, relatedness and growth [13]. These three groups respectively concerns about physiological and safety needs; interpersonal relationships; an intrinsic desire for personal development. Moreover, in this study the relatedness and growth groups are combined and named as social and esteem needs. Existence group is named as physiological and safety needs.

**Prioritization of the customer needs**

The customer needs on the hierarchy are prioritized by using AHP. Although it is suggested in AHP that pairwise comparisons should be made by using (1-9) scale, Since, 1-9 scale causes difficulty in distinguishing the importance levels, Moisiadis [11] in his work pointed out that scales 1-3 or 1-5 give more consistent results than that of 1-9 scale. Hence, in this study 1-5 scale is used. Importance levels for each need can be given in Figure 2.

**Delivering the value to the customers**

Out of the large number of product features created during development, only a few directly and strongly relate to any high-priority customer needs [17]. There are a small number of items that individually have a very significant effect on the amount of value a customer perceives. Such high-value items are essential to satisfying the customer.

**Deploying prioritized customer needs**

The Maximum value is used to plan the delivery of the high priority needs, efficiently. Here, key customer needs are driven forward to the various dimensions of design that must be aligned end-to-end in order to assure customer value. The maximum value table can be seen in Figure 3.
<table>
<thead>
<tr>
<th><strong>CUSTOMER</strong></th>
<th><strong>SITUATIONS</strong></th>
<th><strong>PROBLEMS</strong></th>
<th><strong>NEEDS</strong></th>
<th><strong>SOLUTION</strong></th>
<th><strong>DESIGN</strong></th>
<th><strong>PROJECT</strong></th>
<th><strong>ORGANIZATION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
<td></td>
<td>Problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students from Faculty of Business</td>
<td>In the club room</td>
<td>There are communication problems among student clubs</td>
<td>I want to interact with other people in the campus</td>
<td>Spring festival should be organized within the campus</td>
<td>Rectorship should be organized by the Faculty.</td>
<td>No combination of communication between faculties</td>
<td></td>
</tr>
<tr>
<td>20 year old engineering student</td>
<td>As soon as the lecture finishes the student goes directly towards the bus stop</td>
<td>I do not have any information about the facilities in other faculties</td>
<td>I want to be part of a group</td>
<td>Registration should be organized by the Faculty.</td>
<td>Student should be designed for and socialize except teachers and the central dining hall.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>Administrative personnel working at the central library</td>
<td>Administrative personnel playing football with a plastic ball outside the library</td>
<td>Few places to socialize</td>
<td>I want to explore ideas with other people in the campus</td>
<td>Conferences can be organized</td>
<td>Conferences can be organized.</td>
<td>Too much bureaucracy in sport facility</td>
<td></td>
</tr>
<tr>
<td>Administrative personnel working at the central library</td>
<td>Student eating at the queue to have his sandwich in the canteen</td>
<td>The employee in the sports facility did not let me in</td>
<td>I want to participate in social and cultural activities</td>
<td>There should be courses for different interest areas.</td>
<td>Sports should be designed for both lean and individual sports.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>Research assistant from Faculty of Business</td>
<td>A professor having meal at the dining hall</td>
<td>No food proliferation</td>
<td>I want to do sport out of class times</td>
<td>Sports facilities should be designed for both lean and individual sports.</td>
<td>Sports facilities should be designed for both lean and individual sports.</td>
<td>Too much bureaucracy in sport facility</td>
<td></td>
</tr>
<tr>
<td>Group of students from different faculties</td>
<td>A research assistant from the bus coming to campus</td>
<td>I have to change two vehicles to go to the campus</td>
<td>I want to be treated more kindly by the canteen personnel</td>
<td>Canteens must be inspected regularly</td>
<td>Canteens must be inspected regularly.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>20 year old engineering student</td>
<td>Students eating at the bus stop</td>
<td>It is difficult to find a vehicle after sundown</td>
<td>I want to find food and beverage at any time</td>
<td>Internet precautions for cuisines should be taken.</td>
<td>Internet precautions for cuisines should be taken.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>Administrative personnel from different faculties</td>
<td>An academic personnel in his room and cannot do anything about it needs</td>
<td>Slow internet</td>
<td>I want to access electronic data and services safely, quickly and continuously</td>
<td>Products in the canteens are not fresh.</td>
<td>Products in the canteens are not fresh.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>A research assistant from the faculty of Architecture</td>
<td>An academic personnel walking for the doctor to come to the consultation room in health facility.</td>
<td>The heat of my shoe is broken. I have no idea where to fix it.</td>
<td>I want to be served quickly</td>
<td>Software can be provided by the organization.</td>
<td>Software can be provided by the organization.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>A research assistant from the faculty of Architecture</td>
<td>An administrative personnel office chair at the faculty</td>
<td>I have been waiting for 45 minutes</td>
<td>I want to find my urgent needs such as medicines, writing materials, books, telephone cards and bus tickets, hairdressers, shoe repairer etc.</td>
<td>There must be different banks of ATMs.</td>
<td>There must be different banks of ATMs.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>Administrative personnel walking along the campus</td>
<td>An administrative personnel office chair at the faculty</td>
<td>I am with my family</td>
<td>I want to telephone</td>
<td>There should be a 24 hour call center in the campus.</td>
<td>There should be a 24 hour call center in the campus.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>Administrative personnel walking along the campus</td>
<td>An academic personnel drinking tea outside the library</td>
<td>Anyone even goals can enter the campus</td>
<td>I want emergency medical service</td>
<td>There must be a day care center in the campus.</td>
<td>There must be a day care center in the campus.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>A student</td>
<td>A student going to his car just after the lecture at 5'o clock</td>
<td>I do not feel safe after sundown</td>
<td>I want to be a part of a group</td>
<td>Relationship should provide earning cards.</td>
<td>Relationship should provide earning cards.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>A student</td>
<td>At the canteen of the faculty of engineering, the air is full of smoke and food smell</td>
<td>No ventilation in canteens. Canteens smell badly</td>
<td>I want hygiene in the canteens</td>
<td>More physicians in medical centre</td>
<td>More physicians in medical centre</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
<td></td>
</tr>
<tr>
<td>Administrative personnel walking during lunch time</td>
<td>The office is too hot</td>
<td>I want to breathe fresh air in any place of campus (non smoking zones)</td>
<td>I want to be treated more kindly by the canteen personnel</td>
<td>Internet precautions for cuisines should be taken.</td>
<td>Internet precautions for cuisines should be taken.</td>
<td>No lecture starts in the hall and socialise except teachers and the central dining hall.</td>
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<tr>
<td>FIGURE 1: The Customer Voice Table</td>
<td></td>
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</tr>
</tbody>
</table>

- **Characteristics:** 20 year old engineering student, Administrative personnel working at the faculty of Arts & Sciences, Administrative personnel working at the central library, Administrative personnel working at the Faculty of Business, Art. Prof. from the faculty of Arts & Sciences, Faculty of Business, Graduate student from the Faculty of Arts & Sciences, Group of students from different faculties, Student from Faculty of Business, Student from the Faculty of Science, and a 20 year old engineering student.

- **Needs:** Interaction with other people in the campus, Search for ideas with other people in the campus, Participation in social and cultural activities, Access to electronic data and services safely, quickly and continuously, Finding food and beverage at any time, Accessing urgent needs such as medicines, writing materials, books, telephone cards and bus tickets, hairdressers, shoe repairer, etc.

- **Solutions:** Spring festival should be organized within the campus, Registration should be organized by the Faculty, Conferences can be organized, Internet precautions for cuisines should be taken, Software can be provided by the organization, There must be different banks of ATMs, There should be a 24 hour call center in the campus, Relationship should provide earning cards, More physicians in medical center, Main blood analysis should be done in this campus.

- **Design:** Spring festival should be organized within the campus, Conferences can be organized, Internet precautions for cuisines should be taken, Software can be provided by the organization, There must be different banks of ATMs, There should be a 24 hour call center in the campus, Relationship should provide earning cards, More physicians in medical center, Main blood analysis should be done in this campus.

- **Project:** Spring festival should be organized within the campus, Conferences can be organized, Internet precautions for cuisines should be taken, Software can be provided by the organization, There must be different banks of ATMs, There should be a 24 hour call center in the campus, Relationship should provide earning cards, More physicians in medical center, Main blood analysis should be done in this campus.

- **Organization:** No combination of communication between faculties, Too much bureaucracy in sport facility, No library courses and swimming pool within campus, Guest houses should be built for all academic and administrative personnel, No lecture starts in the hall and socialise except teachers and the central dining hall, No lecture starts in the hall and socialise except teachers and the central dining hall.
FIGURE 2 Hierarchy of Needs and The Importance Levels
Results and Conclusion

The requirements of the stakeholders of the campus are gathered through gemba visits. After analyzing the verbatim and observations, the customer needs are extracted in the Voice of Customer Table as seen in Figure 1. For example, “wires revealing campus boundaries are cut off” is one of the verbatim of a research assistant in the engineering faculty. This research assistant was drinking tea outside the faculty when the interviewers were approaching him. He said “anyone even goats can enter the campus”, he also mentioned about the robbery events occurred because of the insufficient safety precautions. The need extracted from the observations and his verbatim is “I want to feel safe”. Totally twenty nine needs were determined. After structuring these needs, six secondary needs are obtained which are; nutrition, secure environment, health, healthy environment, personal development and social interaction and accessibility. Moreover, with the contributions of the academicians whose professions are organizational behavior, the primary needs are acquired. Nutrition, secure environment, health and healthy environment are grouped under the primary need of *Physiological and Safety Needs (Existence)*; personal development & social interaction and accessibility needs are categorized under *Social and Esteem Needs (Relatedness & Growth)*.

AHP methodology is applied to all hierarchy of needs (primary, secondary and tertiary needs). As can be seen in Figure 2 secondary and tertiary needs have got two importance levels; global and local. Local importance level indicates the ratio within the child node. For example, nutrition (%28.8) gives the importance level in physiological and safety needs excluding the other primary needs. Global importance level indicates the ratio of importance among all needs. For example, nutrition (%11) gives the importance level within all primary needs. According to the global importance levels; the most important primary need is social and esteem needs with an importance level of %62. In the second level of hierarchy, the most important needs are obtained as accessibility (%39.5) and personal development and social interaction (%22.2). The least important secondary need is health with %5.8 importance level. At the bottom level of the hierarchy, the most important needs are obtained as “I want to go to other campuses for free and quickly without waiting” with global importance level of %6.2. “I want to participate in social and cultural activities” %7.5, “I want to interact with other people in the campus” %6.5, “I want to utilize from cheap ticket system” %4.9, “I want to come to the campus quickly” %4.8, “I want to go to other faculties, central library, medical center quickly” %4.8, “I want to find more frequent transportation facilities after sun down” %4.3 “I want to do sport out of class times” %4.

Few needs which are the most important to campus stakeholders that are stated above are then put in to the maximum value table. In this table, each of the critical needs is analyzed by considering to several parameters that will explore in detail what to do in order to deliver the highest benefits and value to the customer. For example, in order to fulfill the need “Going to other campuses for free and quickly without waiting”, the solution should be capable of getting “easy transportation” opportunities. It could be possible to achieve this objective by using shuttle bus and underground transportation facilities at any time of the day. Therefore tasks that should be fulfilled are “shuttle services should be organized both within the campus and between other campuses”, “the number of the shuttles should be increased so that no one has to wait more than ten minutes”, and “underground transportation should be available to the campus”. Similar examples for the other needs are specified and given in tasks column of Figure 3.

The findings extracted from the analysis provide the maximum value table in other words “a road map” for establishing ideal campus settings and activities. Due to the new settlement of Kaynaklar Campus, there are many insufficiencies. Besides; there are various needs and requirements of campus stakeholders that are identified in this study. However, this road map indicates just a few critical needs to campus stakeholders and suggests fulfilling these needs prior to other needs.

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Biographies

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