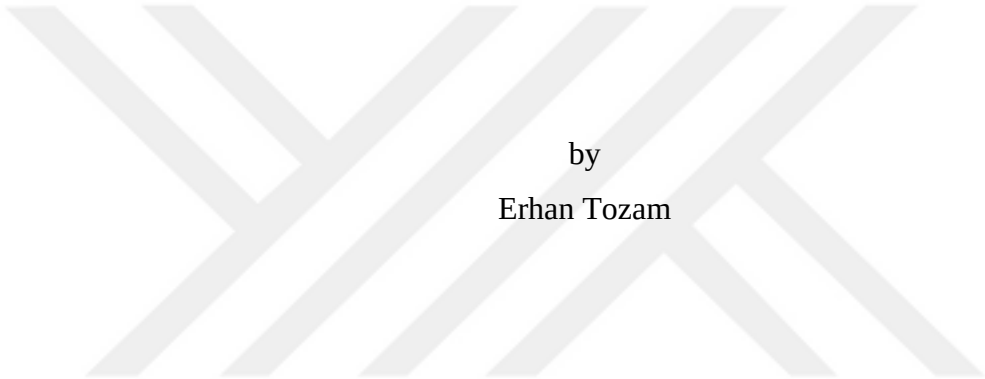


INVESTIGATION OF THE CAUSES OF THE PROBLEMS ENCOUNTERED IN
OPERATION OF REAL ESTATE INVESTMENTS



by
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INVESTIGATION OF THE CAUSES OF THE PROBLEMS ENCOUNTERED IN
OPERATION OF REAL ESTATE INVESTMENTS

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I would like to thank my supervisor, Dr. Özgür Köylüoğlu, for her considerable encouragements, strong guidance and patience during the whole time when I complete this thesis study.

I would like to dedicate this study to my family: my lovely life partner, Elif Tozam, and my cute daughter, Feride Ala Tozam. Thank you for your love, support and faith in me. I hope I have made all of them a little proud.

ABSTRACT

INVESTIGATION OF THE CAUSES OF THE PROBLEMS ENCOUNTERED IN OPERATION OF REAL ESTATE INVESTMENTS

Due to the fact that there is a strong need to operate growingly more sophisticated systems that adds comfort to users as well as to manage health and safety requirements, to increase productivity and efficiency, and to maintain compliance requirements, facility management has become one of the popular phenomenon especially for the last decades. As the projects and initiatives in the context of facility management expand, the need for businesses and organizations to manage all operations and to keep tracking of regulations increases day by day. That is the main reason behind why the facility management is gaining popularity by considering project management and value proposition concepts.

In the thesis, a comprehensive survey study is conducted in order to achieve managerial insights on the relationship between facility and project management, as well as value proposition. In the survey, twenty-two multiple choice questions are asked to fifty-one professionals in order to obtain expert opinion for the purpose of revealing managerial insights as a result of descriptive analysis procedure. This is important for practitioners in real-life projects in terms of highlighting the common opinions, pain points, and priorities with the help of a broad range of data in the context of the topic.

From practical point of view, the proposed survey study is applicable and extendable by reaching more and more professionals within a wider period of time, providing opportunities for generating more and more comprehensive conclusions and insights.

Keywords: Facility Management, Project Management, Value Proposition, Construction

ÖZET

GAYRİMENKUL YATIRIMLARININ İŞLETİMİNDE KARŞILAŞILAN SORUNLARIN NEDENLERİNİN İNCELENMESİ

Kullanıcıların konforunu artıran ve giderek karmaşıklaşan sistemlerin işletiminin yanısıra, sağlık ve güvenlik ihtiyaçlarının yönetilmesine, üretkenlik ve verimliliğin artırılmasına, regülasyon ve uyum gereksinimlerinin sürdürülmesine yönelik güçlü bir ihtiyaç olması nedeniyle, tesis yönetimi özellikle son on yılda popüler olgulardan biri haline gelmiştir.

Projeler ve tesislerin ölçekleri büyüdükçe, bakım, onarım, günlük işletim gibi faaliyetlerin de profesyonel bir organizasyon eliyle, maliyet etkin, tesisin paydaşları için adil bir paylaşım modeli ve kullanıcı memnuniyeti sağlayacak şekilde yönetilebilmesi talebi her geçen gün artmakta, bu talebe paralel olarak yönetmelikler ve standartlar da sürekli geliştirilmektedir.

Tez kapsamında, tesis ve proje yönetimi arasındaki ilişkiye ve değer önerisine ilişkin yönetsel içgörüler elde etmek amacıyla kapsamlı bir anket çalışması yapılmıştır. Ankette, betimsel analiz teknikleri kullanılarak, yönetsel içgörülerin elde edilmesi için elli bir profesyonele yirmi iki çoktan seçmeli soru sorularak uzman görüşleri toplanmıştır. Bu çalışma, gerçek hayattaki proje uygulayıcıları için, konu bağlamında geniş bir veri yelpazesi yardımıyla ortak görüşlerin, sıkıntı yaşanan noktaların ve önceliklerin vurgulanması açısından önemlidir.

Pratik açıdan, önerilen anket çalışması, daha geniş bir zaman diliminde daha fazla profesyonele ulaşılarak uygulanabilir ve genişletilebilir, bu şekilde daha kapsamlı sonuçlar ve içgörülere üretmek mümkün olacaktır.

Anahtar Kelimeler: Tesis Yönetimi, Proje Yönetimi, Değer Önerisi, İnşaat

TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	IV
ABSTRACT.....	V
ÖZET	VI
LIST OF FIGURES	VIII
LIST OF TABLES.....	IX
LIST OF SYMBOLS/ABBREVIATIONS.....	XI
1. INTRODUCTION.....	1
1.1. CONTRIBUTION OF THE THESIS	2
1.2. LIMITATIONS OF THE THESIS.....	3
1.3. STRUCTURE OF THE THESIS	3
2. LITERATURE REVIEW	5
2.1. OVERVIEW OF FACILITY MANAGEMENT	5
2.2. DEVELOPMENT OF FACILITY MANAGEMENT	6
2.3. CONTEXT AND AIMS OF FACILITY MANAGEMENT	7
2.4. KEY SUCCESS FACTORS IN FACILITY MANAGEMENT	11
2.5. RISKS IN FACILITY MANAGEMENT	13
3. A SURVEY STUDY TO INVESTIGATE THE CAUSES OF THE PROBLEMS ENCOUNTERED IN OPERATION OF REAL ESTATE INVESTMENTS.....	15
3.1. METHODOLOGY.....	15
3.2. RESEARCH FINDINGS	16
4. SUGGESTION	37
5. CONCLUSION	39
REFERENCES.....	41
APPENDIX A.....	45
APPENDIX B.....	51

LIST OF FIGURES

Figure 2.1. Historical Development of FM.....	6
Figure 2.2. The Facility Life Cycle.....	7
Figure 3.1 Research Methodology	14



LIST OF TABLES

Table 3.1. The profession of the participants.....	15
Table 3.2. Types of facilities where the participants work in.....	16
Table 3.3. Total construction area that the participants work in their projects.....	16
Table 3.4. The zoning problems of the lands after construction.....	17
Table 3.5. The most compared difficulties in the user of common areas	18
Table 3.6. The ranking of elements that cause problems based on the degree of being problematic	19
Table 3.7. Construction permit and usage functions	20
Table 3.8. The monetary effect of social facilities' operation on monthly expenses	21
Table 3.9. The suitability of facilities for disabled access	21
Table 3.10. The need for extensive changes and infrastructural investments after project completion	22
Table 3.11. The facility infrastructure for emergencies.....	23
Table 3.12. The relationship between sustainability and value proposition in the context of facilities management	24
Table 3.13. The effects of incentives given by state/municipality on the investors' ability to make investment	25
Table 3.14. Expense per square meter of property area per month	26
Table 3.15. The compatibility between facility management legislation and zoning, municipal legislation.....	27
Table 3.16. The relationship between the loss of value and weak transportation and technical infrastructure	28
Table 3.17. The relationship between the value of the facility and the problems in facility management.....	28
Table 3.18. The relationship between the facility value and the state of being multi-owners for facility	29
Table 3.19. Transfer of information and documents to the technical personnel in facilities management.....	30
Table 3.20. The effectiveness and easy implementation of legal remedies against incompliances performed by facility users	31

Table 3.21. The situation of facility management personnel who are knowledgeable and well-educated in the sector	32
Table 3.22. The facility management standards and the knowledge of facility managers about that.....	33
Table 3.23. The distribution of the participants' answers on the effect of professional facility management firms on the project value.....	34



LIST OF SYMBOLS/ABBREVIATIONS

FM	Facility management
IFMA	International facility management association
PFI	Public finance initiatives
PPP	Public-private partnerships
BPO	Business process outsourcing



1. INTRODUCTION

It is a certain fact that globalization and technological changes have been realized extremely rapidly in today's world. This situation forces the businesses to use their scarce resources in the most efficient and effective way in order to survive and keep their positions in such a highly competitive environment. Therefore, businesses are today looking for the ways in order to leverage their assets and services for the purpose of gaining competitive advantages for the future and improving the core business functions by considering the two main targets: minimizing the costs, maximizing the profit or revenue by delivering high and reputable value to the customers. Similar to other sectors, the actors in construction industry are required to develop future-oriented and sustainable solution in the context of facility management in order to both survive such a tough competitive environment and keep their positions for the future.

The forecasts indicate that there is a great potential revenue in facility management, the revenue is reported as around 1,235 billion USD in 2020, and it is expected to reach about 1,759 million in 2028 all around the world [14]. Due to the pandemic conditions, the sectors that touch the facility management practices have been affected negatively. One of the most significant report states that smart technologies and artificial intelligence and the developments in robotics era will have evolutionary impacts on facility management practices in the near future [7]. So, it is quite possible to state that data-driven decisions will gain more and more priority in facility management setting. Increasing population, globalizing world, and depleted resources make it necessary to increase efficiency and productivity not only in facility management but also in all areas, in order to adopt optimization efforts strictly, and to produce maximum value with a sustainable, healthy and environmentalist approach. Also, expansion of outsourcing practices and integrated facility management services are highlighted as the most critical emerging trends globally.

Today, there are common issues and problems that are frequently focused by both professional and various institutions in the sector. Zoning problems of the lands, construction permit and usage functions in the facilities management, operation of social facilities, increasing costs derived from big operational changes and infrastructure investments, sustainability, incentives and challenges in getting incentives from state and

municipality, lack of compatibility in facility management legislation, lack of well-educated and knowledgeable personnel, issues in legal remedies, and lack of knowledge and implementation in facility management standards are summarized as the most popular and up-to-date issues. Therefore, taken as a whole, the inefficiencies, deficiencies and challenges in these issues have negative impacts on the projects not only financially but also strategically and operationally. Financial losses, delays and the presence of risky situations might have negative consequences not only for the project or projects that are operated currently, but also for the projects planned in the future.

In the context of this thesis, a survey study is conducted in order to assess key contexts and to achieve valuable insights by focusing key issues and problems stated in the previous paragraph. First, a comprehensive literature study is performed by focusing on historical development, aims, activities, critical requirements, key success factors, risks and barriers in the context of facilities management. Second, the survey study is conducted. In the survey, twenty-two multiple choice questions are asked to fifty-one professionals in order to obtain expert opinion for the purpose of revealing managerial insights as a result of descriptive analysis procedure. This is important for practitioners in real-life projects in terms of highlighting the common opinions, pain points, and priorities with the help of a broad range of data in the context of the topic.

1.1. CONTRIBUTION OF THE THESIS

The contribution of this thesis can be summarized as follows:

- From practical of view, the study is applicable and extendable by both developing new questions to point out new topics in facility management and project management and reaching more and more professionals in order to achieve more comprehensive and general conclusions as much as possible.
- Due to the fact that the survey study is conducted face-to-face with real professionals in the sector, it is possible to eliminate the common problems such as bias, conflict and misunderstanding in the online survey process for ensuring the reliable and close to real life results by representing a large population of professionals in the sector if the sample is small.

1.2. LIMITATIONS OF THE THESIS

It is of great importance for this study that the surveys are intended to be conducted face-to-face, and the natural behavior and thinking style of the participants are observed. Therefore, the study is completed the data collected from the opinions of fifty-one participants.

Findings based on the existing surveys represent reflections of a real estate market before the Covid-19 pandemic. Since the pandemic impacted the real estate sector on the basis that physical spaces had to be re-evaluated for space requirements, adaptability, whether they are necessary at all after workspaces shifted to online, re-purposing of possibly future obsolete spaces, some of the findings from the survey may have changed in the market. Therefore, the findings can be used to bring out the important parameters that may be periodically surveyed on the market by the professional organizations, to form a database for industry professionals.

1.3. STRUCTURE OF THE THESIS

Section 2 presents a detailed literature review and background.

Section 3 provides the framework of the proposed methodology, including questionnaire design, data collection, data analysis and questionnaire findings in the context of a case study to investigate the sources of problems in facility operations in a comprehensive manner.

Section 4 highlights the conclusions and key findings of the thesis study.

Section 5 includes Appendices.

2. LITERATURE REVIEW

2.1. OVERVIEW OF FACILITY MANAGEMENT

There are many definitions that explain what the facility management (FM) is for a long time. According to International Facility Management Association (IFMA) definition stated in 2010, facility management is “a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology [15,18]. Therefore, the management of project, people, operation and maintenance, risk, performance and quality, security become in the scope of facility management.

In the literature, one of the most powerful definitions is stated as “facility management is responsible for coordinating all efforts related to planning, designing and managing buildings and their systems, equipment and furniture to enhance the organization’s ability to compete successfully in a rapidly changing world [3]”. Considering this definition, it can be concluded that there are three main blocks of activities in FM: plan, design, and manage. Facility management is implemented at various levels to ensure alignment of operational services to the value generated by the user of the facility. At the top level, strategic facility management aims to generate revenue by fulfilling sustainability requirements and acceptable productivity level. In accordance with the strategic facility management decisions, the second level of managerial facility management is carried out to reflect achievement, satisfaction and performance-oriented objectives. It is more proactive and integrative by considering the implementation, control & monitoring, and project management functions. The lowest level of the facility management, namely operational facility management comprises the activities related to running of facilities by considering cost, quality and revenue requirements [18].

2.2. DEVELOPMENT OF FACILITY MANAGEMENT

Facility management is actually a discipline that has been actively present all over the world for the last 40 years. As a discipline, facilities management has been derived from traditional operations and maintenance in Michigan in 1980 [15]. There are many multi-story buildings constructed in the USA, so the need for planning of security, cleaning, maintenance-repair etc. is organized in an interdisciplinary effort for management of these efforts. For example, environmental design of buildings and surroundings, human-oriented planning of projects, air conditioning, sound-heat isolation, comfort needs and expectations has become key topics in the development journey of facilities management in the early stages. The prominent aim is here “to create a good level of life quality” by considering sustainability and safety at first in the long run [12]. Officially, in 1980, International Facilities Management Association was founded in the USA [8]. From the 1980s to today, the context of FM has evolved considerably. The development of FM is summarized in timeline form, in Figure 2.1.

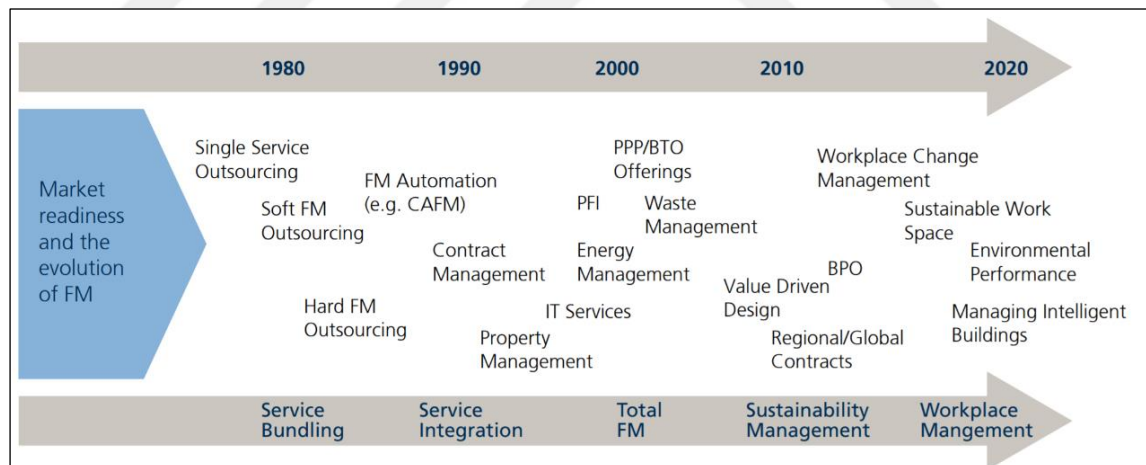


Figure 2.1. Historical Development of FM [15]

In the 1980s, facility management was provided through different types of outsourcing: single service, soft and hard outsourcing. One or multiple services will be outsourced to different actors, and single service outsourcing is advantageous since it is easier to track and keep single service contracts when a service provider is responsible for only one service. Soft outsourcing comprises the outsourcing of soft services such as cleaning, catering, waste management, car parking, security and landscaping. Besides, hard outsourcing includes the services that are related to the fabric of the building and aims to

ensure health and safety of people, such as fire safety systems, lighting, plumbing, heating and air conditioning. So, the context is only related to service bundling on those years. In early 1990s, FM has begun to cover three main topics, which are listed as automation, contract management and property management, by evolving service bundling to service integration. In the 2000s, waste and energy management, and IT Services has become the key scopes in the context of FM. From 2010s to now, sustainability management and workplace management has been accepted as two key and future-oriented phenomena in FM. Also, BPO (Business Process Outsourcing) is highly benefited in payroll, human resources, finance and other internal functions by subcontracting different business-related operations to third-party vendors. So, the main focus becomes change management, value driven design, environmental performance issues, and intelligent buildings. Besides, FM providers are today spending more and more effort and time on developing effective strategies that contribute to the core business for the future.

Today, there are two main FM approaches accepted by all around the world: American and British approaches. Even if the term FM is accepted to be originated from the US, UK is considered to be one of the leading countries in FM practices. There are main differences in American and British FM practices in terms of both approach and execution. In American style, facility manager has key role and responsibilities in planning and coordination for the purpose of reaching higher organizational effectiveness. Therefore, planning, coordination and organizational effectiveness are three main focus points according to American style. On the other hand, British style gives priority to the three main areas: cost efficiency, quality space management and effective support services [3].

2.3. CONTEXT AND AIMS OF FACILITY MANAGEMENT

Facility management practices aim mainly to contribute to the strategic, tactical and operational goals of an organization by managing a wide range of operations effectively. The following figure will both help to understand FM cycle and summarize the main topics by considering the aims.

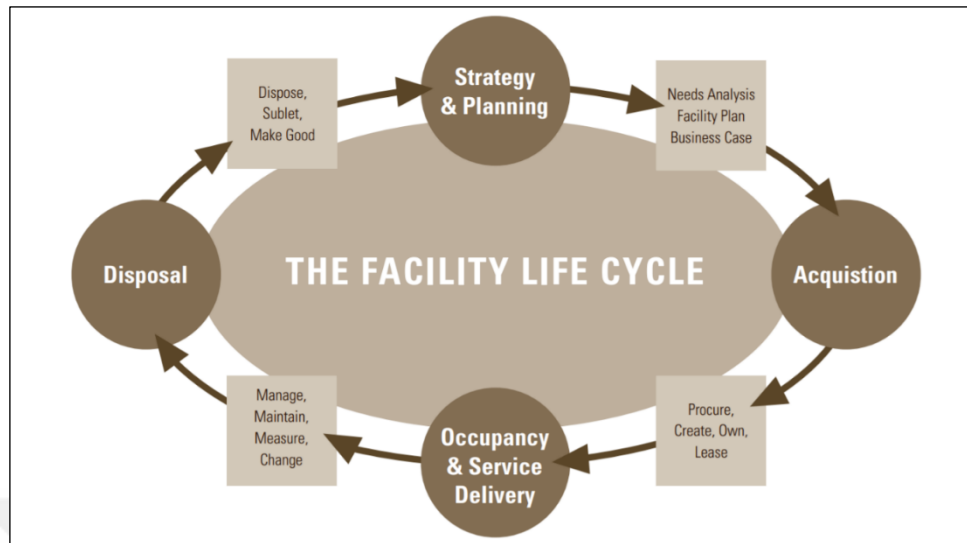


Figure 3.2. The Facility Life Cycle [13]

As seen above, there are four main components in the Facility Life Cycle: Strategy & Planning, Acquisition, Occupancy & Service Delivery and Disposal.

Strategy and planning starts with the analysis of needs, the planning of facility and evaluation of business cases. After this stage, acquisition of the facility is realized with one of the alternative methods, ranging from creating and owning to procurement or leasing. During the occupancy of the facility, service delivery is provided through management, maintenance, measurement of performance and changing parts of the facility when needed. Once the facility is not able to provide value to the existing users, alternative disposal strategies are evaluated; such as subletting, making good, so the facility can be renovated to the owner's changing needs or disposing the facility off. After the disposal stage, the facility starts to serve for the new strategy that it is re-purposed, possibly for the new function that it is going to be utilized for and accordingly, it starts a new cycle for the new function.

Core competencies necessary for FM are stated as in the following in 2009 Global Job Task Analysis [16].

- Communication
- Emergency preparedness and business continuity
- Environmental stewardship and sustainability

- Finance and business
- Hospitality management
- Human factors
- Leadership and strategy
- Operations and maintenance
- Project management
- Quality
- Real estate and property management
- Technology

These core competences are actually the fundamental building blocks of FM, and they are all active competences in every single FM project and practice. Also, the success of any business in FM practices is highly dependent on how successfully these core competencies are implemented by the businesses. The relative importance of these core competencies changes, depending on the business it serves and its strategy. The need for close communication thanks to technological developments, the critical importance of leadership and strategy and higher awareness toward the environment and sustainability have direct impacts on the success of FM projects in today's highly technological and rapidly changing world.

Considering all core competencies, in the context of facility management, there are common activities and functions that should be fulfilled by utilizing the core competencies when executing FM projects.

These typical activities and functions can be listed as follows [2]:

- Management of service quality and planning
- Management of property services
- Management of administration and contracts
- Management of finance and information

These activities and functions mainly focus on operations and maintenance, energy efficiency, space layout and flexibility, sustainability, ergonomics, water, waste and safety. Operations and maintenance is an essential element of the FM. According to British Standard Glossary of terms, maintenance can be defined as “the combination of all

technical and administrative actions, including supervision actions, intended to retain an item in, or restore it, to a state in which it can perform a required function [22]”. Maintenance can be predictive, preventive, proactive, reactive, planned, corrective, or improvement-oriented, so it requires planning and management of these processes. Energy efficiency is extremely significant as a major cost element as well as its importance in terms of sustainability, since energy is a primary source of greenhouse gas emissions in the world. Basically, energy is used in buildings for space heating, cooling, ventilation, lighting, cooking, refrigeration, water heating, and office equipment [20]. This is quite important, since the energy efficiency is absolutely critical in order to sustain the environment through lower greenhouse gas emissions, to support economic development by helping stabilize electricity prices and volatility, as well as balancing the demand against the increase in the world population. Space layout and flexibility is another important topic in FM, because flexibility and space layout practices are today gaining more and more popularity by helping the businesses to ensure functionality and efficiency in the environment, as well as contributing the employee satisfaction and lower churn rates [9]. Sustainability can be defined as “a process that creates a vision of community that respects the prudent use of natural resources to ensure that the present generations achieve a high degree of economic security and can attain democracy and popular participation in the control of their communities while maintaining the integrity of the ecological systems and of life” [17]. It is important to highlight that there are three major areas in the context of sustainability: economy, environment and society. In facilities management, whether the project is a commercial one or a residential project, demands from the users of the facilities as well as their surroundings can be best satisfied in projects that implement sustainability criteria. Environmental sustainability mostly refers to reduction of waste, pollution, emissions, hazardous/harmful and toxic materials’ consumption, and efficiency in energy usage, each benefitting the owners/users of the facility. Social sustainability is mostly related to communities and human such as encouragement of diversity, offering equal opportunities, promotion of connectivity and ensuring of life quality etc. which adds value to users and community around the facility. Economic sustainability simply represents how degree the project or initiative can balance the revenue and cost within the sustainable level for the future. Ergonomics can be considered as a preventive strategy in FM practices, especially in office facilities. Workstation design, workstation furnishings, lighting and noise are the main focus and assessment areas in the ergonomics [6]. Water and its

management is another important parameter in facility management. It is a certain fact that all organizations and businesses should today be aware of the need for saving the water as they are capable of, since the world will more likely face water shortages and increasing costs in the near future. Therefore, the best practices to increase water efficiency of equipment, systems, assets and processes are critical in today's FM practices. Besides, similar to water management, waste management is another critical requirement or topic in FM. According to Environmental Protection Agency, nearly 75 percent of all waste that ends up in landfills is recyclable [19]. Considering both water and waste management, improper management of them are potentially main driver behind serious health threats as a result of fires, explosions, contamination of air, soil and water. So, the new developments in recycling, efficiency and sustainability are so important for the future of the world. Finally, safety. is also critical in terms of regulations and compliance, as well as being prepared against any risk or threat in FM. Safety is not only related to people, it is also related to environment and workplace. Continuous improvement and timely tracking and monitoring of performance, and fulfillment of compliance and legal requirements by following policies, standards and practices are the main areas in the context of FM safety.

2.4. KEY SUCCESS FACTORS IN FACILITY MANAGEMENT

Under the facilities management, it is a certain fact that each project or initiative has a project performance roadmap. So, project performance can be measured based on six main drivers: cost, time, quality, clients' satisfaction, functionality, health and safety. Quality in the context of FM can be defined as "meeting the requirements of the owner's need as to functional adequacy; providing the services on time and within the budget, reduction of life-cycle costs and operation and maintenance" [1]. Specific requirements under these main drivers can be a multiple of different requirements depending on the type of the facility.

In the literature, there are many studies that focus on these main drivers commonly. These studies diversify the approach and methodology in the assessment and grouping of key success factors. For example, many studies concluded that it is critical to ensure the key success factors in facilities management in order to carry out FM services within a pre-

planned budget and time by satisfying required quality, safety and environmental limits [5, 11].

Another group of literature studies determined three main topics related to critical success factors by covering the six main drivers as stated. First, budget management comprises budget compliance, documentation management, nonconformities in project plan, nonconformities in work suppliers and subcontractors. Second, time management includes in delays, insufficient management of critical processes and influence of project management and the number of accidents during project implementation. These two main drivers have direct connection with quality management. The last one is project team performance which are dependent on insufficient control of project activities, insufficient program management, nonconformities of personnel operations and work of suppliers and subcontractors, errors in documentation and mislead records, number of accidents during project implementation, and the nonconformities in environmental and work safety aspects [21].

A couple of literature studies that conduct real-life practices in their studies list the most influential success factors in FM areas follows [4, 10].

- The commitment of clients toward the requirements of other stakeholders
- Clear and precise targets and prioritization of all stakeholders
- Tracking of sustainability principles by governmental and professional bodies
- Technical and managerial knowledge and know-how
- Following and satisfying previously defined expectations, requirements, roles and responsibilities
- High quality in especially implementation stage
- Fulfillment of social, economic and environmental sustainability requirements

In summary, all success factors are shaped around people, place, process and technology, which are known as four main actors in FM context.

2.5. RISKS IN FACILITY MANAGEMENT

One of the most important issues in FM is risk management. Risk is simply referred to as the chance of something happening that have potentially affected negatively the results and targets. There are two main concepts in dealing with risk management practices: the probability of an event (that is risky and hazardous) and the level of risk (high risk, medium risk, low risk etc.)

Risk management is critical in especially construction projects due to the fact that there are potentially various risk factors and their consequences. Naturally, these risks cause potential delay(s) in the completion time that is previously planned. In terms of facilities management, there are many uncertain factors that lead to risk such as construction parties' performance, the availability of resources, environmental conditions, contractual relations etc. Therefore, risk assessment has critical importance in facilities management, specifically in construction projects [5]. There are potentially many risks emerged in facilities. In general, environmental risks, physical risks, risk of financial loss and viability, property risks, business and human life risks are the common examples of types of risks in facilities [17]. There is a globally accepted risk management procedure. This classic procedure includes six main steps, listed as follows [13].

- Determination of the context

It comprises the development of strategic, organizational and risk management context, as well as development of criteria and proposing the final risk management structure at the first step.

- Identification of risks

This stage find the answers of “What can happen and how can it happen?”

- Analysis and evaluation of risks (Assessment)

Assessment stage has two sub-steps. First one is analysis of risks which are interested in determination of likelihood and consequences, basically in order to forecast the level of risk. Second, at the evaluation stage, the criteria are compared, and the risks are set based on their priorities in order to assess the acceptance level of each risk factor.

- Treatment of risks

At the treatment stage, the treatment alternatives are identified, evaluated, selected, prepared and implemented, respectively.

- Communication and consultancy both internally and externally

It is very critical to ensure the continuity of both internal and external communication in the risk management process in order to ensure that the risk management cycle is healthy, sustainable and standardized in the long run.

- Monitoring and review

Even if the monitoring and review becomes the last step in the risk management, it never ends when the FM is live and has ongoing processes in time. Monitoring is mainly searching for “is there any change in the risk level of any task, operation or process since the last review?” If there is any change either likelihood or its potential consequence, required actions are taken immediately. If there is no change, no action is required. The review mainly focuses on “what are the new emerging risks?” If there is any new risk emerged, it is analyzed by considering the likelihood and potential impacts. In the long run, monitoring and review is significant for businesses to act proactively.

3. A SURVEY STUDY TO INVESTIGATE THE CAUSES OF THE PROBLEMS ENCOUNTERED IN OPERATION OF REAL ESTATE INVESTMENTS

3.1. METHODOLOGY

For this thesis study, there are four main steps in the context of research methodology. Figure 3.1 shows the steps and their purposes and methods.

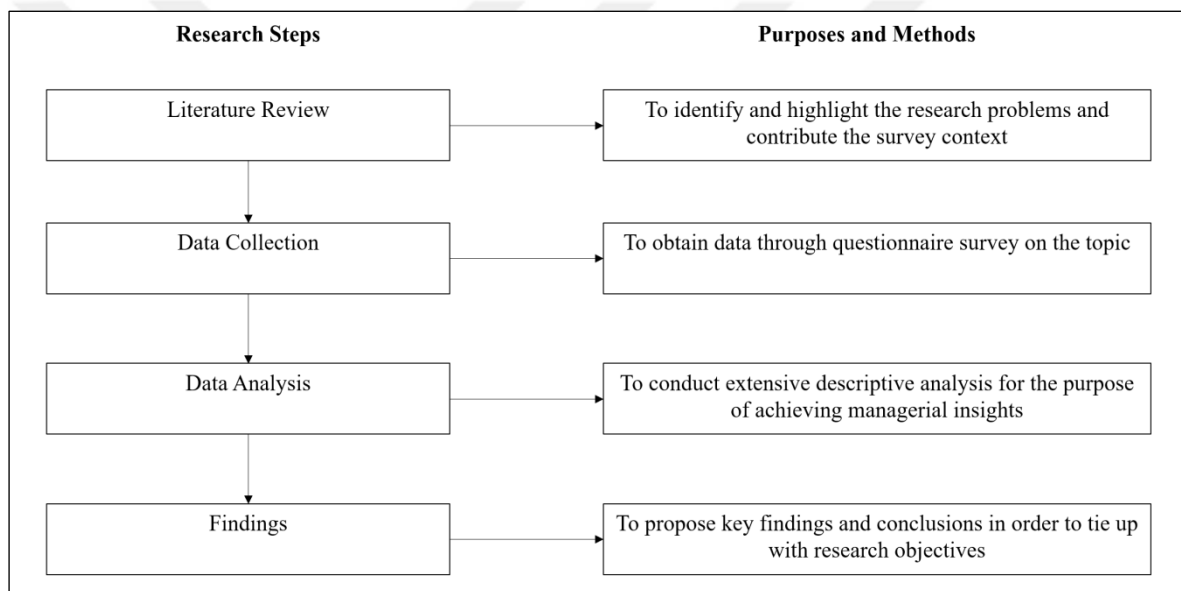


Figure 4.1. Research Methodology

First, a literature review is conducted to identify and highlight the research problems and contribute to the survey context. The literature review is followed by data collection through face-to-face questionnaire survey. The survey includes two types of answer format : rating-based and selective-based. In rating based questions, participants are asked to rate their opinions based on a 5-point Likert scale, ranging from “disagree” to “very strongly agree”. Also, there are two different rating-based questions that participants are asked to rank the options or factors by ranking them 1 to 5 based on importance levels. In selective-based questions, participants are asked to mark their professions, total construction area of their projects and average amount of expense per square meter per month on their projects,

so that variations of the responses to rating based questions according to different groups of construction professionals as well as project size can be determined.

At the third step, descriptive analysis is conducted for the purpose of managerial insights. Finally, data-driven conclusions and key findings are summarized in order to tie up with research objectives.

3.2. RESEARCH FINDINGS

This section includes the interpretations and findings of the survey. The surveys are performed in face-to-face environments in order to achieve higher response rate within relatively shorter time. Table 3.1 shows the distribution on the profession of participants in the questionnaire survey.

Table 3.1. The profession of the participants

Profession of Participants	Frequency (n=51)	Percentage (%)
Academician	1	2
Municipality / Public Institution	1	2
Real Estate Investor	4	8
Contractor	3	6
Facility / Building Manager	39	76
Facility / Building Manager & Municipality / Public Institution	1	2
Facility / Building Manager, Real Estate Investor	2	4

There are 51 participants in total and all participants in the survey stated their profession, so response rate for this question is 100 percent. The majority of participants (~ 82 percent with double professions) have a profession of “Facility / Building Manager”. The proportion of participants who work only as facility / building manager is 76 percent. There are 2 percent participants work as both facility / building manager and in municipality / public institution. 4 percent of them work as both facility / building manager and real estate investor. The proportion of participants who only work as real estate investor is 8 percent. Also, the participants who become academician or work at

municipality / public institution have the same proportion among all participants, 2percent. 6 percent of the participants work also as contractor.

In addition to profession question, the participants were asked which type of facilities they work in, and the majority (~ 56 percent) select “mixed” in the options, by indicating shopping mall, residence, office, industrial facility and touristic facility. Almost 20 percent of the participants are dealing with either office construction or housing in the sector. Only 2 percent of them are dealing with only the construction of industrial facilities. All participants answer this question, contributing the response rate (100 percent).

Table 3.2 highlights the distribution on types of facilities in the context of survey.

Table 3.2.Types of facilities where the participants work in

Types of Facilities	Frequency (n=51)	Percentage (%)
Industrial Facility	1	2
Office	10	19
Mixed (Shopping Mall, Residence, Office, Industrial Facility, Touristic Facility)	28	56
Housing	11	21
Other	1	2

Since there are no at least two distinct groups of professions, statistical difference will not be analyzed in this study. In the context of survey, sub-topics and key issues will be highlighted by supporting with descriptive analyses.

Total construction area (closed area) where the participants work in their projects are asked to mark in the survey. Table 3.3 shows the distribution of different construction areas that are collected from the participants.

Table 3.3. Total construction area that the participants work in their projects

Total construction area	Frequency (n=51)	Percentage (%)
5.000 – 10.000 m ²	5	10

10.000 – 20.000 m ²	7	13
20.000 – 40.000 m ²	5	10
More than 40.000 m ²	32	63

Majority of the participants (~ 63 percent) as seen on Table 3.3 work at the projects which total closed construction area is higher than 40.000 m². 10 percent of the participants state that they are working at the projects where total construction area is either 5.000 – 10.000 m² or 20.000 – 40.000 m². 7 participants (~ 13 percent) select 10.000 – 20.000 m² when stating total construction area in their projects. There are 2 participants do not give an answer to this question, therefore the response rate for this question is 96 percent.

In the next question, the participants were asked to indicate their opinion whether they agree or disagree by considering 1 as disagree 5 as strongly agree.

The zoning problems of the lands create important problems for the facility managers after the construction.

Table 3.4 states the distribution of the participants' answers for the zoning problems of the lands.

Table 3.4. The zoning problems of the lands after construction

Statement: The zoning problems of the lands create important problems for the facility managers after the construction.	Frequency (n=51)	Percentage (%)
Disagree	2	4
Slightly agree	7	14
Agree	16	32
Strongly Agree	6	12
Very strongly agree	18	36

The majority of participants state their opinion as either agree or very strongly agree, 32 percent and 36 percent, respectively. There are only 2 participants (4 percent) do not think the zoning problems are not problematic after the construction. 14 percent of them (7 participants) have an opinion as slightly agree, and 12 percent of them (6 participants) give an answer as strongly agree to this opinion.

- Considering the opinion of majority, the zoning problems of the lands are critical in creating problems for facility managers after construction.

On the next two questions, participants are asked to compare the elements by giving 5 points to the most critical one and 1 to the least critical one.

Rank the most compared difficulties in the use of common areas in projects by giving 5 points to the most and 1 point to the least.

Table 3.5 shows the distribution of the participants' opinions on the most compared difficulties.

Table 3.5. The most compared difficulties in the user of common areas

Statement: Rank the most compared difficulties in the use of common areas in projects by giving 5 points to the most and 1 point to the least.	Overall ranking	Frequency (n=51)
Expense sharing	2	8
Revenue sharing	1	18
Space occupations by users	5	14
Uncertainty of allocated areas	2	9
Use of functions contrary to the management plan	3	14

There are 30 participants who accomplish this ranking question, the rest of them (21 participants) do not complete the ranking on this question. Therefore, the response rate for this question is 60 percent. On Table 3.5, overall ranking refers to the mode of ranking that are retrieved from participants' feedback. Instead of average, the mode is preferred to summarize overall opinion, since it is probably the most suitable statistical metric by interpreting the rank order. Frequency represents the number of participants that give an opinion that is equal to the overall ranking score. The key findings are summarized as follows, by considering only the participants who perform the ranking on this question.

- Considering the responsive participants on this question, 47 percent of respondents who rank these difficulties indicate that the most important difficulty in the use of common areas is stated as "space occupations by users".

- Majority of respondents (~ 60 percent) state that “revenue sharing” is the least important difficulty in the use of common areas.
- “Use of functions contrary to the management plan” is ranked as 3rd critical difficulty by the 47 percent of responsive participants in the use of common areas.
- Expense sharing and uncertainty of allocated areas are sharing the 2nd place in ranking with ~ 30 percent of responsive participants on this question.

In the facilities management, since the summary is not proposed at the project stage, please rank the elements that cause problems by giving 5 to the most problematic element and 1 to the least problematic one.

Table 3.6 shows the distribution of the participants’ opinions in the context of this question.

Table 3.6. The ranking of elements that cause problems based on the degree of being problematic

Statement: Please rank the elements that cause problems by giving 5 to the most problematic element and 1 to the least problematic one.	Overall ranking	Frequency (n=51)
Access road and entrances	2	13
Parking	5	16
Heating, electrical infrastructure	5	9
Rainwater, drainage infrastructure	1	14
Goods / Logistics entry and exit problems	1	10

Similar to previous question, there are 32 participants who accomplish this ranking question, the rest of them (19 participants) do not complete the ranking on this question. Therefore, the response rate for this question is 64 percent.

On Table 3.6, overall ranking refers to the mode of ranking that are retrieved from participants’ feedback. Instead of average, the mode is preferred to summarize overall opinion, since it is probably the most suitable statistical metric by interpreting the rank order. Frequency represents the number of participants that give an opinion that is equal to the overall ranking score. The key findings are summarized as follows, by considering only the participants who perform the ranking on this question.

- Considering the responsive participants on this question, “parking” and “heating, electrical infrastructure” are sharing the 1st place, ranked as most problematic elements by approximately 41 percent and 50 percent of the respondents, respectively.
- The least problematic elements are stated as “rainwater, drainage infrastructure” and “goods / logistics entry and exit problems” by the responsive participants. About 44 percent of participants are ranked “rainwater, drainage infrastructure” as the least problematic element, and 32percent of them are ranked “goods / logistics entry and exit problems” as the least problematic element.
- “Access road and entrances” is ranked as 2nd problematic element by approximately 41 percent of the responsive participants.

Construction permit and usage functions are compatible and/or they do not cause problems in the facility management.

Table 3.7 states the distribution of the participants’ answers on the compatibility of construction permit and usage functions.

Table 3.7. Construction permit and usage functions

Statement: Construction permit and usage functions are compatible and/or they do not cause problems in the facility management.	Frequency (n=51)	Percentage (%)
Disagree	14	28
Slightly agree	14	28
Agree	16	32
Strongly Agree	4	8
Very strongly agree	1	2

There are only 2 participants who do not state any opinion on this statement, so the response rate is higher than 95 percent. The majority of participants state their opinion as either disagree or slightly agree (56 percent in total). On the other hand, there is an important segment in the overall participants that agree the statement that construction permit and usage functions are compatible and/or they do not cause problems in the facilities management. Only 10 percent of participants support the statements strongly/very strongly.

- Considering the opinion of majority, it can be concluded that there are two main opinions on the compatibility of construction permit and usage functions. First, the dominant idea is construction permit and usage functions are either not compatible or slightly compatible and they potentially cause problems in facility management. The second segment of participants supports the idea that they do not cause problems in facilities management, since they are compatible. The ratios are very close to each other, so almost equal proportion within the opposite ideas on this statement might depend on the types of facilities they are working on, geographic or other internal and external factors.

The next question is about social facilities. The participants are asked to state their opinions on the operation of social facilities has a big monetary effect on monthly expenses.

Table 3.8 states the distribution of the participants' answers for the monetary effect of social facilities' operation on monthly expenses.

Table 3.8. The monetary effect of social facilities' operation on monthly expenses

Statement: The operation of social facilities has a big monetary effect on monthly expenses.	Frequency (n=51)	Percentage (%)
Disagree	7	14
Slightly agree	7	14
Agree	22	44
Strongly Agree	4	8
Very strongly agree	7	14

There are only 4 participants who do not state any opinion on this statement, so the response rate is higher than 90 percent. The majority of participants state their opinion as agree, even considering the agree, strongly agree and very strongly agree groups, there are nearly 70 percent of responsive participants support the idea that there is a big monetary effect of social facilities operation on the monthly expenses. 14 percent of the participants think there is no big monetary effect on monthly expenses derived from social facilities operation. Similarly, 14 percent of participants have an opinion as slightly agree.

- It can be concluded that the social facilities operation has a significant monetary impact on monthly expenses according to the majority of participants' responses.

The next question is related to disabled access to the facilities. The participants are asked to state their opinions on the facilities are suitable for disabled access, and they do not result in problems from operational perspective.

Table 3.9 states the distribution of the participants' answers for disabled access within the facilities.

Table 3.9. The suitability of facilities for disabled access

Statement: The facilities are suitable for disabled access, and they do not result in problems from operational perspective.	Frequency (n=51)	Percentage (%)
Disagree	9	18
Slightly agree	15	30
Agree	13	26
Strongly Agree	4	8
Very strongly agree	7	14

There are only 3 participants who do not state any opinion on this statement, so the response rate is higher than 90 percent. The domination about the suitability of facilities for disabled access belong to slightly agree and agree options. Also, there are an important proportion of the participants (~ 18 percent) indicate that the facilities are not suitable for disabled access, so this situation results in problems at all. 11 participants (~ 22percent) find the facilities are suitable for disabled access, and there are no problems from operational perspective.

- Considering the participants who either do not agree or slightly agree with this statement as a group, it is obvious that facilities are not more likely to become suitable for disabled access, and there are problems from operational perspective.

Next, the participants are asked to state their opinions on after the completion of the project, there is an obvious need to operate extensive changes and infrastructure investments in the electricity, water and landscape infrastructure of the facility in order to reduce the operation costs which brings a great burden on the property owners.

Table 3.10 states the distribution of the participants' answers on this statement as given above.

Table 3.10. The need for extensive changes and infrastructural investments after project completion

Statement: After the completion of the project, there is an obvious need to operate extensive changes and infrastructure investments in the electricity, water and landscape infrastructure of the facility in order to reduce the operation costs which brings a great burden on the property owners.	Frequency (n=51)	Percentage (%)
Disagree	5	10
Slightly agree	6	12
Agree	26	52
Strongly Agree	5	10
Very strongly agree	4	8

There are 5 participants who do not state any opinion on this statement, so the response rate is almost 90 percent. There are more than 50 percent of the participants agree this statement. Also, considering the participants who strongly agree and very strongly agree, there is almost 70 percent of the participants highlight that extensive changes and infrastructure investments are required after the project completion and these changes and investments have great impact on budget which property owners are responsible for. Only 5 participants state that there are no required changes and investments after project is completed. 6 participants (12 percent) indicate that the requirements and changes are slightly required after the project completion.

- It is certain that the extensive changes and infrastructure investments are required after the project completion in general, and they have significant impact on operation and finance which the property owners are responsible for satisfying requirements on them.

The next question is about the facility infrastructure planning for emergencies. The participants are asked to state their opinions on the facilities are planned for uninterrupted electricity, water, transportation, heating and cooling infrastructure for emergencies.

Table 3.11 states the distribution of the participants' answers for the infrastructure of facilities in case of emergency situations.

Table 3.11. The facility infrastructure for emergencies

Statement: The facilities are planned for uninterrupted electricity, water, transportation, heating and cooling infrastructure for emergencies.	Frequency (n=51)	Percentage (%)
Disagree	4	8
Slightly agree	8	16
Agree	24	48
Strongly Agree	7	14
Very strongly agree	4	8

There are 4 participants who do not state any opinion on this statement, so the response rate is higher than 90 percent. It is critical to highlight that almost half of respondents think the facilities are planned for uninterrupted electricity, water, transportation, heating and cooling infrastructure against the emergency situations. Considering the strongly agree, very strongly agree groups of participant, this ratio reaches almost 75 percent. Only 4 participants do not agree this statement by considering the facilities are not well-planned in case of emergencies. 8 participants (16 percent) slightly agree this statement due to their concerns about plan details against emergencies.

- Considering the overall scenario, it can be concluded that majority of participants agree that the facilities are planned with interrupted electricity, water, transportation, heating and cooling infrastructure for emergencies.

Next, the participants are asked to state their opinions on the fact that a project is sustainable project (electricity / water / heating efficient, self-generating and water recovery) will enable it to be easily sold with considerably higher value.

Table 3.12 states the distribution of the participants' opinions about the relationship between sustainability and value proposition in the context of facilities management.

Table 3.12. The relationship between sustainability and value proposition in the context of facilities management

Statement: The fact that a project is sustainable project (electricity / water / heating efficient, self-generating and water recovery) will enable it to be easily sold with considerably higher value.	Frequency (n=51)	Percentage (%)
Disagree	0	0
Slightly agree	4	8
Agree	17	34
Strongly Agree	12	24
Very strongly agree	14	28

There are only 4 participants who do not state any opinion on this statement, so the response rate is higher than 90 percent. All participants agree on that the sustainable projects will contribute to the value in a positive when selling them. There is no participant who support the opposite idea. Also, only 8 percent of participants state their opinions as slightly agree.

- It is a clear fact that sustainability is one of extremely criterion not only in construction projects but also in every area worldwide. More than 90 percent of participants are aware of the importance and positive affects of sustainability, as they shared their experience by highlighting positive effects of sustainable projects on the financial revenue from these projects.

The next question is about the incentives given by state/municipality. The participants are asked to state their opinions on if the state/municipality gives and incentive for a sustainable facility, investors will invest in such structures despite the increase in costs.

Table 3.13 states the distribution of the participants' opinions on the effects of incentives given by state/municipality on the investors' ability to make investment on sustainability.

Table 3.13. The effects of incentives given by state/municipality on the investors' willingness to make investment on sustainability

Statement: If the state/municipality gives and incentive for a sustainable facility, investors will invest in such structures despite the increase in costs.	Frequency (n=51)	Percentage (%)
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Disagree	2	4
Slightly agree	8	16
Agree	23	46
Strongly Agree	8	16
Very strongly agree	5	10

There are 5 participants who do not express their opinions on the incentives given by state/municipality, therefore the response rate is around 90 percent. Considering the overall responses, it can be concluded that almost half of the respondents state that the incentives given by state/municipality for the sustainable facilities have positive impact on the investors' intent to make investments despite the increases in costs. Considering the strongly agree, very strongly agree groups of participant, this ratio reaches almost 75 percent. Only 2 participants do not believe in the positive effects of incentives given by state/municipality on the investors' ability to make investment on sustainability.

- Considering the overall scenario, it can be concluded that majority of participants agree that if the state/municipality gives incentive for a sustainable facility, investors will invest in such structures despite the increase in costs.

On the next question, the participants are asked to specify the range of expenses per unit square meter on their projects, based on year 2017 TL prices. For the operation and monthly expenses of the facilities, the property owners pay the following amount per unit square meter of property area per month, including all expenses such as electricity, water, natural gas, security, landscaping, cleaning etc.

Table 3.14 shows the distribution of different expense ranges per unit square meter of property area per month that are collected from the participants.

Table 3.14. Expense per square meter of property area per month

Expense per square meter of property area per month	Frequency (n=51)	Percentage (%)
1 – 5 TL/month/m ²	6	12
6 – 10 TL/month/m ²	8	16
11 – 15 TL/month/m ²	6	12
16 – 20 TL/month/m ²	9	18

21 – 25 TL/month/m ²	15	30
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There are 7 participants who do not state opinions on this question, so the response rate is around 85 percent. 15 participants (30 percent) state that expense per square meter of property area per month is between 21 - 25 TL/month/m². 9 participants highlight the operation and monthly expenses per unit square per month is around 16 – 20 TL/month/m². 16 percent of participants (8 participants) note that the expense per square meter of property area per month is between 6 - 10 TL/month/m². The number of participants who note that this expense is around either 1 - 5 TL/month/m² or 11 - 15 TL/month/m² is the same : 12 percent - 6 participants.

- Considering the overall situation, it can be concluded that the expense per square meter of property area per month is higher than 16 TL/month/m² according to majority (nearly half of the participants).
- Knowing that most of the participants are operating mix use projects and that they manage more than 40,000 m² area, this figure may represent large area mix-use projects.

Next, the participants are asked to state their opinions on facility management legislation is compatible with zoning and municipal legislation, and there are not many problems.

Table 3.15 states the distribution of the participants' answers on this statement as given above.

Table 3.15. The compatibility between facility management legislation and zoning, municipal legislation

Statement: Facility management legislation is compatible with zoning and municipal legislation and there are not many problems.	Frequency (n=51)	Percentage (%)
Disagree	16	32
Slightly agree	10	20
Agree	16	32
Strongly Agree	1	2
Very strongly agree	3	6

There are 5 participants who do not state any opinion on this statement, so the response rate is almost 90 percent. It is critical to highlight that 32 percent of participants think that facility management legislation is not compatible with zoning and municipal legislation and there are problems derived from this situation. Only 8 percent of participants (4 participants) believe the compatibility between facility management legislation and zoning, municipal legislation exists and there are no problem due to the lack of compatibility. 32 percent of the participants also agree in the compatibility of facility management legislation and zoning, municipal legislation. 20 percent of the participants agree slightly to this statement.

- It can be concluded that considering the participants who disagree and slightly agree on this statement as a group, the majority are more likely to believe in that the facility management legislation is not compatible with zoning and municipal legislation and there are many problems.

Next, the participants are asked to state their opinions on projects with weak transportation and technical infrastructure lose a great value during usage.

Table 3.16 states the distribution of the participants' answers about the relationship between the loss of value and weak transportation and technical infrastructure.

Table 3.16. The relationship between the loss of value and weak transportation and technical infrastructure

Statement: Projects with weak transportation and technical infrastructure lose a great value during usage.	Frequency (n=51)	Percentage (%)
Disagree	1	2
Slightly agree	0	0
Agree	18	36
Strongly Agree	12	24
Very strongly agree	16	32

There are 4 participants who do not state any opinion on this statement, so the response rate is almost 90 percent. Majority of the participants agree on the statement weak transportation and technical infrastructure leads to the loss of value during usage (92

percent). Only 1 participants do not think that there is no loss of value derived from weak transportation and technical infrastructure.

- In summary, transportation and technical infrastructure has critical importance in the value of the project. Weak transportation and technical infrastructure causes the loss of project value, according to the majority of the participants who are experts and professionals in FM sector.

Next, the participants are asked to state their opinions on after the projects are put into operation, the value of facility decreases if there are problems in facility management.

Table 3.17 states the distribution of the participants' answers on the relationship between the value of facility and the problems in FM.

Table 3.17. The relationship between the value of the facility and the problems in facility management

Statement: After the projects are put into operation, the value of facility decreases if there are problems in facility management.	Frequency (n=51)	Percentage (%)
Disagree	5	10
Slightly agree	4	8
Agree	17	34
Strongly Agree	5	10
Very strongly agree	17	34

There are only 3 participants who do not state any opinion on this statement, so the response rate is higher than 90 percent. Only 18 percent of the participants state their opinion as either disagree or slightly agree. On the other hand, there is an important segment in the overall participants that agree the statement that after the projects are put into operation, the value of facility decreases if there are problems in facility management. In total, there are 78 percent of the participants think that when there are problems in facility management, the facility value has been affected in a negative way.

- Considering the opinion of majority, it can be concluded that the problems exist in the facility have negative impacts on facility value.

On the next question, the participants are asked to state their opinions on the value of commercial facility decreases if there are multi-owners (Commercial: office, shopping center, business center etc.).

Table 3.18 states the distribution of the participants' answers on the relationship between the value of the facility and the state of being multi-owners of facility.

Table 3.18. The relationship between the facility value and the state of being multi-owners for facility

Statement: The value of commercial facility decreases if there are multi-owners (Commercial: office, shopping center, business center etc.).	Frequency (n=51)	Percentage (%)
Disagree	13	26
Slightly agree	11	22
Agree	16	32
Strongly Agree	2	4
Very strongly agree	5	10

There are only 4 participants who do not state any opinion on this statement, so the response rate is higher than 90 percent. 13 participants (26 percent) do not believe the relationship between the facility value and the existence of multi-owners for the facility. Similarly, there is a significant group of participants (22 percent, 11 participants) think that there is a weak relationship between facility value and the existence of multi-owners. The highest proportion with 32 percent belong to the participants who agree the statement. Also, there is 14 percent of the participants agree strongly or very strongly the relationship between the facility value and the existence of multi-owners for facility.

- Overall, although it seems like the majority of the participants say they agree the relationship between the facility value and the existence of multi-owners for facility, there is a significant group of participants (48 percent in total) who either do not agree or agree slightly.

On the next question, the participants are asked to state their opinions on after the completion of the project, all kinds of information and documents are ready for technical personnel to get to know the technical infrastructure and the necessary trainings have been transferred to the technical personnel of the facility management.

Table 3.19 states the distribution of the participants' answers on transfer of information and documents to the technical personnel in facility management.

Table 3.19. Transfer of information and documents to the technical personnel in facilities management

Statement: After the completion of the project, all kinds of information and documents are ready for technical personnel to get to know the technical infrastructure and the necessary trainings have been transferred to the technical personnel of the facility management.	Frequency (n=51)	Percentage (%)
Disagree	6	12
Slightly agree	18	36
Agree	16	32
Strongly Agree	3	6
Very strongly agree	5	10

There are only 3 participants do not state any opinion about this question, so the response rate is higher than 90 percent. The proportion of the participants who disagree the transfer of information and documents to the technical personnel in facilities management are ready after the project completion is only 12percent. Majority of participants either slightly agree or agree this statement. Only 16percent of the participants agree strongly or very strongly the transfer process is always ready immediately after the project completion.

- In summary, it seems that there are two separate groups of participants who have opposite opinions toward the statement. Even if the domination belongs to “agree” side, considering disagree and slightly agree as a group, the transfer progress might depend on internal and external factors for each individual project, therefore the opposite opinions such as on this survey might have equal proportion by indicating two main opposite sides.

Next, the participants are asked to state their opinions on when the facility users do not comply with facility management plan, legal remedies are sufficient, deterrent and can be implemented quickly.

Table 3.20 states the distribution of the participants' answers on the effectiveness and easy implementation of legal remedies against incompliances performed by facility users.

Table 3.20. The effectiveness and easy implementation of legal remedies against incompliances performed by facility users

Statement: When the facility users do not comply with facility management plan, legal remedies are sufficient, deterrent and can be implemented quickly.	Frequency (n=51)	Percentage (%)
Disagree	11	22
Slightly agree	17	34
Agree	13	26
Strongly Agree	3	6
Very strongly agree	4	8

There are only 3 participants do not state any opinion about this question, so the response rate is higher than 90 percent. It is critical to highlight that 56 percent of the participants do not think the facility managers do not comply with facility management plan, legal remedies are sufficient, deterrent and can be implemented quickly. This is extremely important output in terms of both legal remedies and the attitude of users who utilize the facility. There are only 14 percent of the participants agree either strongly or very strongly the effectiveness and easy implementation of legal remedies against incompliances performed by facility users. Nearly 26 percent of participants agree to this statement, totaling a 40 percent agreement.

- Considering the disagree and slightly agree group, it is more likely to conclude that there are incompliances performed by users and legal remedies are insufficient, undeterred and can not be implemented quickly.

Next, the participants are asked to state their opinions on there are a sufficient number of knowledgeable and well-educated facility management personnel in the sector.

Table 3.21 states the distribution of the participants' answers on the situation of facility management personnel who are knowledgeable and well-educated in the sector.

Table 3.21. The situation of facility management personnel who are knowledgeable and well-educated in the sector

Statement: There are a sufficient number of knowledgeable and well-educated facility management personnel in the sector.	Frequency (n=51)	Percentage (%)
Disagree	16	32
Slightly agree	19	38
Agree	10	20
Strongly Agree	1	2
Very strongly agree	1	2

There are only 4 participants do not state any opinion about this question, so the response rate is higher than 90 percent. When the proportion of disagree and slightly agree participants, it is clear that there is a lack of knowledgeable and well-educated personnel in the sector. Also, the proportion of the participants who agree either strongly or very strongly support this claim, since only 2 participants (4 percent) think there are a sufficient number of knowledgeable and well-educated facility management personnel in the sector.

- Majority of participants think that there are no or very low number of personnel who has a good level of knowledge and become well-educated in the sector. For the long term, it is extremely critical to increase their intellectual capital that allows them to use their assets more effective and efficient ways.

On the next question, the participants are asked to state their opinions on there are facility management standards in the industry and facility managers know these standards.

Table 3.22 states the distribution of the participants' answers on the facility management standards and the knowledge of facility managers about that.

Table 3.22. The facility management standards and the knowledge of facility managers about that

Statement: There are facility management standards in the industry and facility managers know these standards.	Frequency (n=51)	Percentage (%)
Disagree	7	14
Slightly agree	15	30
Agree	18	36
Strongly Agree	3	6
Very strongly agree	4	8

There are only 4 participants do not state any opinion about this question, so the response rate is higher than 90 percent. Majority of the participants either agree or slightly agree that there are facility management standards in the industry and facility managers know these standards. There are 14 percent of participants who either disagree or strongly/very strongly on this statement.

- According to the opinions of participants, there are two different groups. First group agree this statement by indicating facility management standards exist and facility managers know about it. Second group slightly agree the existence of facility management standards and the awareness of facility managers on these standards.

Finally, the participants are asked to state their opinions on the management of the facilities by professional facility management firms to have positive effect on the project value by increasing the value significantly.

Table 3.23 states the distribution of the participants' answers on the effect of professional facility management firms on the project value.

Table 3.23. The distribution of the participants' answers on the effect of professional facility management firms on the project value

Statement: The management of the facilities by professional facility	Frequency	Percentage
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management firms have positive effect on the project value by increasing the value significantly.	(n=51)	(%)
Disagree	0	0
Slightly agree	3	6
Agree	9	18
Strongly Agree	8	16
Very strongly agree	27	54

There are only 4 participants do not state any opinion about this question, so the response rate is higher than 90 percent. There is no participant who disagree the management of the facilities by professional facility management firms have positive effect on the project value by increasing the value significantly. More than 54 percent of the participants agree very strongly by indicating professional facility management firms have positive impacts on the project value. There are only 3 participants agree slightly with this statement. The rest of them (nearly 34 percent) either agree or strongly agree with this statement.

4. SUGGESTION

The survey study is responded heavily by professionals working in commercial facilities management. One group of problems are related to zoning problems and mis-alignment of use functions with the construction permit. These facilities also have parking and utility infrastructure deficiencies. Such problems are associated with provision of construction permit for lands that are not appropriate for development, given the access road capacity and existing utility infrastructure. Adding the pressure from investor for maximizing the construction area for maximizing cash flow, the infrastructure burden is usually born by the users of the facility as well as the neighboring settlements. In order to prevent traffic congestion, parking and utility (power, water, drainage, wastewater) infrastructure insufficiency problems, the municipalities have to request calculations for checking capacity requirement versus availability. Public awareness on effect of new projects on the neighborhood is also necessary for adequate control on compliance of a new project to approved design documents. It is of crucial importance to define land development zoning requirements based on delicate numerical calculations based on neighborhood population as expected visitor capacity according to the use function of the land.

Another problem that is agreed on by most of the professionals is that major changes are made on the infrastructure investments in order to reduce the operation costs. This reflects the lack of consideration of the operational costs by the designers. In line with this result, facility's resilience for power of water shortages in case of emergencies is found to be low, since most of the professionals declare that uninterrupted infrastructure support is not provided in the facilities that they managed. This shows the need for a design approach considering the whole life cycle performance of a constructed facility. In order to facilitate this design approach, enforcements for calculation of operational costs in addition to the construction costs of a building can be requested from the designers with at least two alternatives, for assessment during the construction permit processes. When professionals were asked whether a sustainable producing its own utility need would have a better market value, almost all of them agreed with the proposition supporting the importance of efficient infrastructure need for the operational phase of a facility. Most of the professionals also agreed that incentives for sustainability would encourage sustainable structures. Thus, it can be concluded that regulations and incentives for sustainable buildings would align

designers and constructors for a better infrastructure facility achieving more efficient infrastructure as well as resilience.

The relationship between conservation of value of a constructed facility is also investigated and most of the professionals agreed that facilities having operational problems as well as weak transportation and technical infrastructure loose value. This finding while supporting previous findings, shows also importance of the need for increasing awareness of the real estate investors in order for them to demand from the designers consideration of the operational performance of facilities.

Another common issue, availability of operation manuals and trainings for the facility management staff was asked it is agreed by most of the professionals that these documents are not available to facility managers after the construction. In order to make sure that the contractors provide these documents to the owners, commissioning requirements can be added to standard administrative regulations, starting from public procurement system, thinking that it will also be exemplary for private funded construction.

Facility management as a profession was also investigated in the study and it is found that facility management legislation was not found in compliance with the zoning and municipal legislations. Lack of well educated facility management personnel and facility management standards are almost agreed as common problems in the survey, addressing the need for standardization and licencing of facility management professional. Survey also shows an agreement on importance of management of facilities by qualified facility management personnel in terms of increasing value. Therefore, there is need for regulation of the facility management profession in order to increase use satisfaction as well as sustain value of the facility for investors's benefit.

The results from the survey shows substantiation of the common problems that were communicated among the construction industry professionals. The findings show that new regulations are needed to assess performance of a facility before construction, both for construction and also for operational quality and servicability.

5. CONCLUSION

Facility management is one of the most critical discipline for providing ease and comfort to the users of various residential and commercial facilities by integrating people, place, process and technology through a variety of implementations and practices in real life. Globalization, technological changes and advances, the increase in both local and global competitors, increasing population, depleted resources and higher awareness for sustainability with especially new generations become key factors that shape the direction of FM today. Businesses must today find effective and efficient ways and methods in the operation and execution of FM for projects with a sustainable, healthy and environmentalist approach. This is the most prominent competitive advantage for FM businesses and companies in order to survive and keep their positions in such a highly competitive environment for the future.

This thesis study aims to investigate the causes of the problems encountered in the operation of real estate investments. In the context of this thesis, a survey study is conducted in order to assess key contexts and to achieve valuable insights by focusing key issues and problems stated in the previous paragraph. First, a comprehensive literature study is performed by focusing on historical development, aims, activities, critical requirements, key success factors, risk and barriers in the context of facilities management. Second, the survey study is conducted. In the survey, twenty-two multiple choice questions are asked to fifty-one professionals in order to obtain expert opinion for the purpose of revealing managerial insights as a result of descriptive analysis procedure. This is important for practitioners in real-life projects in terms of highlighting the common opinions, pain points, and priorities with the help of a broad range of data in the context of the topic.

The key findings and conclusions from the survey study can be summarized as follows.

- According to the majority of the participants, the zoning problems of the lands are critical in creating problems for facility managers after construction.
- Space occupations by users is found the most important difficulty in the use of common areas by the participants. After space occupations, the participants rank the expense sharing and uncertainty of allocated areas as 2nd important difficulty,

followed by use of functions contrary to the management plan. On the other hand, revenue sharing is reported as the least important difficulty in the use of common areas.

- The parking and heating, electrical infrastructure are noted as the most problematic elements according to survey participants, followed by access roads and entrances. The least problematic element is found as rainwater, drainage infrastructure and good / logistics entry and exit.
- It can be concluded that the social facilities operation has a significant monetary impact on monthly expenses according to the majority of participants' responses.
- According the respondents' opinions, it is obvious that facilities are not more likely to become suitable for disabled access and there are problems from operational perspective.
- It is certain that the extensive changes and infrastructure investments are required after the project completion in general, and they have significant impact on operation and finance which the property owners are responsible for satisfying requirements on them.
- Majority of participants agree that the facilities are planned with uninterrupted electricity, water, transportation, heating and cooling infrastructure for emergencies.
- It is a clear fact that sustainability is one of extremely criterion not only in construction projects but also in every area worldwide. More than 90 percent of participants are aware of the importance and positive affects of sustainability, as they shared their experience by highlighting positive effects of sustainable projects on the financial revenue from these projects.
- Majority of participants agree that if the state/municipality gives and incentive for a sustainable facility, investors will invest in such structures despite the increase in costs.
- Majority of the participants are more likely to believe in that the facility management legislation is not compatible with zoning and municipal legislation and there are many problems.
- Transportation and technical infrastructure has critical importance in the value of the project. Weak transportation and technical infrastructure causes the loss of

project value, according to majority of the participants who are experts and professionals in FM sector.

- Considering the opinion of majority, it can be concluded that the problems that exist in the facility have negative impacts on facility value.
- Majority of the participants state that there are incompliances performed by users and legal remedies are insufficient, undeterred and can not be implemented quickly.
- Majority of participants think that there are no or very low number of personnel who has a good level of knowledge and who are well-educated in the sector. For the long term, it is extremely critical to increase their intellectual capital that allows them to use their assets more effective and efficient ways.

The survey study helps clarify problems seen in the use phase of the real estate projects that will possibly give insight to designers to consider these problems in designing the buildings, as well as shedding light on the need for stronger regulations to manage the problems encountered at the use phase successfully. Most of the questions were derived from previous meetings conducted with a few industry professionals'. The aim of the study is to reach out to a larger group of FM professionals to see if these problems were common in the industry and to see their relative weight.

There are two main contributions of this study. First, from practical of view, the study is applicable and extendable by both developing new questions to point out new topics in facility management and project management and reaching more and more professionals in order to achieve more comprehensive and general conclusions as much as possible. Second, due to the fact that the survey study is conducted face-to-face with real professionals in the sector, it is possible to eliminate the common problems such as bias, conflict and misunderstanding in the online survey process for ensuring the reliable and close to real life results by representing a large population of professionals in the sector if the sample is small.

REFERENCES

1. Ali, A. S., & Rahmat, I. (2010). The performance measurement of construction projects managed by ISO-certified contractors in Malaysia. *Journal of Retail & Leisure Property*, 9(1), 25-35.
2. Amaratunga, D., & Baldry, D. (2004). Process Thinking in Facilities Management: An Analytical View. (s. 320-331). Salford, UK: USIR. [http://usir.salford.ac.uk/9966/adresinden alındı](http://usir.salford.ac.uk/9966/adresinden%20alındı)
3. Azman Mohamat Nor, N., Mohammed, A. H., & Alias, B. (2014, November). Facilities Management History and Evolution. *International Journal of Facilities Management*, 5(1).
4. Banihashemi, S., Hosseini, M. R., Golizadeh, H., & Sankaran, S. (2017). Critical Success Factors (CSFs) for integration of sustainability into construction project management practices in developing countries. *International Journal of Project Management*, 35, 1103-1119. <http://dx.doi.org/10.1016/j.ijproman.2017.01.014> adresinden alındı
5. Bassiony, M. S., El-Karim, A. A., Abdel-Alim, A. M., & El Nawawy, O. A. (2017). Identification and assessment of risk factors affecting construction projects. *HBRC Journal*, 13, 202-216. <http://dx.doi.org/10.1016/j.hbrcj.2015.05.001> adresinden alındı
6. BOMI International. (N/A, N/A N/A). *Ergonomics and Facilities Management*. FMLINK: <https://www.fmlink.com/articles/ergonomics-and-facilities-management/> adresinden alındı
7. CBRE. (2021, N/A N/A). *Top trends in facilities management - How society, demographics and technology are changing the world of FM*. 2021 tarihinde CBRE: [https://www.cbre.es/-](https://www.cbre.es/)

/media/cbre/countryspain/documents/research/global/cbre101389%20trends%20in%20fm%20report_final.pdf adresinden alındı

8. CEF. (N/A, N/A N/A). *A Brief History of Facilities Management*. 2021 tarihinde CEF Your Electrical Experts: <https://www.cef.co.uk/blog/1647-a-brief-history-of-facilities-management> adresinden alındı
9. Chaiwat, R. (2006). Flexible workplace: benefits and concerns in facilities management. *Journal of Architectural/Planning Research and Studies*, 4, 41-52.
10. Chan, A. P., & Chan, A. P. (2004). Key performance indicators for measuring construction success. *Benchmarking: An International Journal*, 11, 203-221. doi:<https://doi.org/10.1108/14635770410532624>
11. Demirkesen, S., & Ozorhon, B. (2017). Impact of integration management on construction project management performance. *International Journal of Project Performance*, 35, 1639-1654. <https://doi.org/10.1016/j.ijproman.2017.09.008> adresinden alındı
12. Erentürk, M. K., & Barla, M. C. (2016, N/A N/A). Dış Kaynak Kullanımı ile Tesis Yönetiminin Konutlardaki Yaşam Kalitesine Katkıları ve Bir İnşaat Firması Üzerine Çalışma. *T.C. Haliç Üniversitesi Sosyal Bilimler Enstitüsü İşletme Anabilim Dalı İşletme Programı*. İstanbul, İstanbul, Turkey. <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp> adresinden alındı
13. FMA Australia. (2004). *Facility Management Guidelines to Managing Risk*. Australia: Facility Management Association of Australia Limited.
14. Fortune Business Insights. (2021, May N/A). *Industrial Services - Facility Management Market*. 2021 tarihinde Fortune Business Insights: <https://www.fortunebusinessinsights.com/industry-reports/facility-management-market-101658> adresinden alındı
15. Haas, H. D., & Hansen, A. P. (2010). Facilities Management in a service supply chain perspective. *Logistics and Supply Chain Management in a Globalised Economy, Proceedings of the 22nd Annual NOFOMA Conference* (s. 631-645). Denmark:

Department of Entrepreneurship and Relationship Management, University of Southern Denmark, Kolding.

16. IFMA. (2021, July 9). *What if Facilities Management?* IFMA: <https://www.ifma.org/about/what-is-facility-management/> adresinden alındı
17. Martens, M. L., & Carvalho, M. M. (2017). Key factors of sustainability in project management context: A survey exploring the project managers, perspective. *International Journal of Project Management*, 35, 1084-1102. doi:<http://dx.doi.org/10.1016/j.ijproman.2016.04.004>
18. Patanapiradej, W. (2006). The Scope of Facility Management. *Journal of Environmental Design and Planning*, 1, 75-90. <https://ph01.tci-thaijo.org/index.php/nakhara/article/view/102624> adresinden alındı
19. Shelby, B. (2020, June 16). *6 Ways to Improve Facility Management Operations*. RoadRunner Smarter Recycling: <https://www.roadrunnerwm.com/blog/improve-facility-management-operations> adresinden alındı
20. SKANSKA. (2013). *Energy Efficiency in Buildings Guidance for Facilities Managers*. N/A: Sustainable United Nations. https://group.skanska.com/48dc86/siteassets/sustainability/environmental-responsibility/energy/unep_energy-effic-broch-final.pdf adresinden alındı
21. Zavadskas, E. K., Vilutiene, T., Turskis, Z., & Saparauskas, J. (2014). Multi-criteria analysis of Projects' performance in construction. *Archives of Civil and Mechanical Engineering*, 14, 114-121. <http://dx.doi.org/10.1016/j.acme.2013.07.006> adresinden alındı
22. Zawawi, Z. A., Khalid, M. K., Ahmad, N. A., Zahari, N. F., Aras, N., & Salim, A. (2012). Operations and Maintenance in Facilities Management Practices: A Gap Analysis in Malaysia. *MATEC Web of Conferences*, 66, N/A. doi:10.1051/mateccnf/2016600116

APPENDIX A: SURVEY FOR FACILITY MANAGEMENT- DESIGN-VALUE RELATIONSHIP (TESİS YÖNETİMİ – PROJE – DEĞER İLİŞKİSİ ANKETİ)

İzin için lüfen işaretleyiniz: “ Bu anketin, bir üniversitenin yüksek lisans tezi için araştırma amaçlı kullanılacağı konusunda bilgilendim ve verdiğim bilgilerin bu amaçla kullanımına, verilerin değerlendirme sonuçlarının yayınlanmasına izin veriyorum.

1. Aşağıdakilerden hangileri çalışma alanınızdır? (LÜTFEN SAĞDA VE SOLDA HER İKİ ALANDA İŞARETLEME YAPINIZ)

Tesis/Bina Yöneticisi	Alışveriş Merkezi
Gayrimenkul Yatırımcısı	Konut
Mühendis	İşyeri
Belediye / Kamu Kurumu	Karma
Akademisyen	Endüstriyel Tesis
Diğer (Belirterseniz seviniriz):	Turistik Tesis
	Diğer (Belirterseniz seviniriz):

2. Çalışma alanınıza giren proje toplam inşaat alanı (kapalı alan) büyüklüğünü işaretleyiniz.
- ☐ 1000 – 5000 m²
 - ☐ 5000 – 10000 m²
 - ☐ 10000 – 20000 m²
 - ☐ 20000 – 40000 m²
 - ☐ 40000 m²’den büyük
3. Arsaların imar sorunları, inşaat sonrasında tesis yöneticileri için önemli sorunlar ortaya çıkarmaktadır.
- ☐ Katılmıyorum
 - ☐ Az katılıyorum
 - ☐ Katılıyorum

- Çok katılıyorum
 - Kesinlikle katılıyorum
- 4. Projelerde ortak alanların kullanımında en çok karşılaşılan zorlukları, en çok olana 5 puan, en az olana 1 puan vererek paylaşınız.
 - Gider paylaşımı
 - Gelir paylaşımı
 - Kullanıcıların alan işgalleri
 - Tahsisli alanların belirsiz olması
 - Yönetim planına aykırı fonksiyon kullanımı
- 5. Tesis yönetiminde, proje aşamasında özet gösterilmediği için tesisin yönetiminde en çok sorun çıkartan unsurları, en çok sorun yaratana 5, en az sorun yaratana 1 vererek sıralayınız.
 - Yaklaşım yolları ve girişler
 - Otopark
 - Isınma, elektrik altyapısı
 - Yağmur suyu, drenaj altyapısı
 - Mal/Lojistik giriş çıkış sorunları
- 6. İnşaat ruhsatı ile kullanım fonksiyonları uyumludur ve/veya sorunlar tesisin yönetiminde sorun yaratmaz.
 - Katılmıyorum
 - Az katılıyorum
 - Katılıyorum
 - Çok katılıyorum
 - Kesinlikle katılıyorum
- 7. Sosyal tesislerin işletilmesi aylık giderlerde büyük bir yük oluşturuyor.
 - Katılmıyorum
 - Az katılıyorum
 - Katılıyorum
 - Çok katılıyorum

- Kesinlikle katılıyorum
8. Tesislerin engelli erişimi için uygundur ve işletmede sorun çıkartmamaktadır.
- Katılmıyorum
 - Az katılıyorum
 - Katılıyorum
 - Çok katılıyorum
 - Kesinlikle katılıyorum
9. Tesisin elektrik, su, peyzaj altyapısında, projenin tamamlanmasından sonra, işletme maliyetlerini düşürmek amacıyla kapsamlı değişiklikler, altyapı yatırımları yapma ihtiyacı olmakta, bu da mülk sahiplerine büyük bir yük getirmektedir.
- Katılmıyorum
 - Az katılıyorum
 - Katılıyorum
 - Çok katılıyorum
 - Kesinlikle katılıyorum
10. Tesisler acil durumlar için kesintisiz elektrik, su, ulaşım, ısıtma, soğutma altyapısı düşünülerek planlanmıştır.
- Katılmıyorum
 - Az katılıyorum
 - Katılıyorum
 - Çok katılıyorum
 - Kesinlikle katılıyorum
11. Projenin sürdürülebilir (elektrik/su/ısıtma tasarruflu ve kendi enerjisini üreten, su geri kazanımı yapan) bir proje olması kolay satılabilmesini ve daha yüksek bir değer ile satılabilmesini sağlayacaktır.
- Katılmıyorum
 - Az katılıyorum
 - Katılıyorum
 - Çok katılıyorum
 - Kesinlikle katılıyorum

12. Devlet/belediye sürdürülebilir tesis için bir teşvik verirse yatırımcılar maliyet artışına rağmen bu tür yapılara yatırım yaparlar.

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum

13. Tesislerin işletilmesi ve aylık giderleri için mülk sahipleri, elektrik, su, doğalgaz, güvenlik, peyzaj, temizlik vb. tüm giderler dahil olmak üzere ayda birim metrekare mülk alanı başına aşağıdaki mertebeye masraf ödemektedir:

- ☐ (1 ila 5) TL/ay/m²
- ☐ (6 ila 10) TL/ay/m²
- ☐ (11 ila 15) TL/ay/m²
- ☐ (16 ila 20) TL/ay/m²
- ☐ (21 ila 25) TL/ay/m²

14. Tesis Yönetimi Mevzuatı imar ve belediye mevzuatları ile uyumludur ve çok sorun çıkmamaktadır.

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum

15. Ulaşım ve teknik altyapısı zayıf olan projeler kullanım sırasında büyük ölçüde değer kaybeder.

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum

16. Projeler işletmeye alındıktan sonar tesisin değeri, tesis yönetiminde sorunlar varsa düşüyor.

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum

17. Ticari tesisin değeri, tesis çok malikli ise düşüyor (Ticari: ofis, alışveriş merkezi, iş merkezi v.b.)

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum

18. Proje tamamlandıktan sonar teknik personelin teknik altyapıyı tanınması için her türlü bilgi ve doküman hazır durumdadır ve gerekli eğitimler tesis yönetimi teknik personeline aktarılmıştır.

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum

19. Tesislerin kullanıcıları, tesis yönetimi planına uygun davranmadığında hukuki çözüm yolları yeterlidir, caydırıcıdır ve hızla uygulanabilir.

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum

20. Sektörde yeterli sayıda, bilgili ve donanımlı tesis yönetim elemanı bulunabilmektedir.

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum

21. Sektörde tesis yönetim standartları mevcuttur ve tesis yöneticileri bu standartları bilmektedir.

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum

22. Tesislerin profesyonel tesis yönetim firmaları tarafından yönetilmesi projenin değerini çok artırır.

- ☐ Katılmıyorum
- ☐ Az katılıyorum
- ☐ Katılıyorum
- ☐ Çok katılıyorum
- ☐ Kesinlikle katılıyorum