GRID ARCHITECTURE, PLANNING AND DESIGN JOURNAL
GRİD MİMARLIK, PLANLAMA VE TASARIM DERGİSİ

Vol. 7, No. 2, 2024, 341-362 / Cilt 7, Sayı 2, 2024, 341-362 / DOI: 10.37246/grid.1278725

Strategies for improving briefing framework: an evaluation study with industry practitioners

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Abstract

Briefing is one of the important processes for capturing requirement knowledge from investor and user clients in the construction industry. In addition to briefing, designers use various techniques and technologies to capture, identify, validate, and track the client's wishes and apply them as requirements to develop projects with these processes. Developments in the information/knowledge technologies and research for briefing frameworks affect professional practice by giving the capability and possibility to manage the increasing amount of knowledge and to implement them into building projects through a life cycle. The expertise and approaches of designer architects are important for developing strategies and methods on briefing because of their acting role as industry practitioners. This study focuses on the evaluation of architects on a briefing framework proposal via interviews. The paper then explores the theoretical background and presents the interview structures and framework proposal. Comments, suggestions, and thoughts on the benefits of industry practitioners are presented and discussed to state important facts to develop a comprehensive briefing framework.

Highlights

- Important issues for briefing and knowledge management requirement elicitation in design process are explored.
- Overall framework for comprehensive briefing process is developed by unified modelling language. The object oriented language has significant contributions to improve the process.
- The thoughts and comments of architect in private practice are conducted to underline strategies for improving briefing framework.

Keywords

Briefing; Architects in practice; Knowledge management; Requirement elicitation; UML.

Article Information

Received:
07.04.2023

Received in Revised Form:
14.02.2024

Accepted:
14.04.2024

Available Online:
30.10.2024

Article Category

Research Article

This article is produced from the doctoral thesis titled "A Data-driven Requirement Elicitation System for Pre-project Stage" written in Graduate School of Natural and Applied Sciences at Middle East Technical University.

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Çalışkan, E.B. & Pekeriçli, M.K. (2024). Strategies for improving briefing framework: an evaluation study with industry practitioners. *GRID Architecture, Planning and Design Journal, 7*(2), 341-362.

GRID ARCHITECTURE, PLANNING AND DESIGN JOURNAL
GRİD MİMARLIK, PLANLAMA VE TASARIM DERGİSİ

Vol. 7, No. 2, 2024, 341-362 / Cilt 7, Sayı 2, 2024, 341-362 / DOI: 10.37246/grid.1278725

Brifing çerçevesini iyileştirme stratejileri: sektör uygulayıcıları ile yapılan bir değerlendirme çalışması

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Öz

Brifing, yapı sektöründe yatırımcı ve kullanıcılardan gereksinim bilgilerini toplamak için kullanılan önemli süreçlerden biridir. Brifing sürecine ek olarak, tasarımcılar, müşteri isteklerini anlamak, tanımlamak, doğrulamak ve izlemek için çeşitli teknikler ve teknolojiler kullanır. Ortaya çıkan gereksinimleri projelerini geliştirmek için bu süreçlerde kullanırlar. Bilgi/teknoloji alanındaki gelişmeler ve brifing üzerine yapılan araştırmalar, artan bilgi miktarını yönetme ve bunları yapı projelerine yaşam döngüsü süresince kullanma imkânı sağlayarak mesleki çalışmaları etkiler. Tasarımcı mimarların uzmanlıkları ve yaklaşımları, sektör uygulayıcıları olarak aktif rollerinin olması nedeniyle brifing süreçleri için strateji ve yöntem geliştirmede önemlidirler. Bu çalışma, bir brifing çerçevesi önerisinin mimarlar tarafından mülakat aracılığı ile değerlendirilmesine odaklanmaktadır. Makale, konu hakkındaki teorik arka planını sunarak, mülakat yapısını ve çerçeve önerisini anlatmaktadır. Sektör uygulayıcılarının yorumları, önerileri ve görüşleri verilmiş, tartışılarak kapsamlı bir brifing çerçevesi geliştirmek için önemli unsurlar ortaya konulmuştur.

Öne Çıkanlar

- Tasarım sürecinde brifing ve bilgi yönetimi gereksinimlerinin belirlenmesine yönelik önemli konular incelenmiştir.
- Kapsamlı brifing süreci için genel bir çerçeve, birleşik modelleme dili kullanılarak geliştirilmiştir. Nesne yönelimli dil, sürecin iyileştirilmesine önemli katkılar sağlamaktadır.
- Özel sektördeki mimarların düşünceleri ve yorumları, brifing çerçevesini iyileştirme stratejilerini geliştirmek için değerlendirilmiştir.

Anahtar Sözcükler

Brifing; Uygulamada mimarlar; Bilgi yönetimi; Gereksinim belirleme; UML

Makale Bilgileri

Alındı:
07.04.2023
Revizyon Kabul Tarihi:
14.02.2024
Kabul Edildi:
14.04.2024
Erişilebilir:
30.10.2024

Makale Kategorisi

Araştırma Makalesi

*Bu makale, Orta Doğu Teknik Üniversitesi Fen Bilimleri Enstitüsü bünyesinde yazılan "Ön Proje Aşaması İçin Veriye Dayalı Gereksinim Belirleme Sistemi" adlı doktora tezinden üretilmiştir.

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Çalışkan, E.B. & Pekeriçli, M.K. (2024). Brifing çerçevesini iyileştirme stratejileri: sektör uygulayıcıları ile yapılan bir değerlendirme çalışması. *GRID Mimarlık, Planlama ve Tasarım Dergisi, 7*(2), 341-362.

INTRODUCTION

The construction process starts with feasibility studies on investment, continues with definitions of requirements and statements, and ends with the execution of construction and commissioning of the building. Diverse roles, project stakeholders, and processes participate in each construction phase. The overall construction process is organized as a series of phases that are part of a planned construction work: a building, substructure, and infrastructure (E. Olatokun & Pathirage, 2015). Traditionally, the building lifecycle is divided into four phases: briefing, planning, production, and (facility) management (Ryd, 2004). In the 1970s, the briefing was conceived as a process of discrete steps, where design could not begin until the briefing stage was completed (Blyth & Worthigton, 2010). As for today's view, the briefing captures and transforms knowledge between client/end-user, architect/design team, and construction team by implementing new methods and techniques (Authors, 2020). Thus, briefing is a vital tool and process for the collaborative work of different project stakeholders to achieve project success. Additionally, for the success and correct execution of construction works in accordance with the projects' objectives, briefing processes between project stakeholders are crucial. It is a method for sustaining dialogue and teamwork when the construction project is still in its early stages.

This study presents the briefing subject with its processes, usage, and relation to the overall construction process. It proposes an initial framework of the briefing process for requirement elicitation and validation. A briefing framework is developed, and the proposed system is represented with Unified Modelling Language. Interview sessions with industry experts were held to evaluate the proposal. The objective is to take feedback for briefing framework proposal and maintain a discussion section for further improvement. Architects with professional experience are involved in the evaluation, followed by a presentation of the simplified version of the proposed system, including the activities and relations. The minutes of the meeting are presented under three headings and discussed. The improvements on the proposed briefing framework will be done by interpreting the thoughts and comments of practitioners, including benefits, possible contributions, and problems of the proposed system.

THEORETICAL FRAMEWORK

Construction Briefing

The briefing is a process of identifying requirements and objectives, articulating and matching them at the proper time and proper project stage. Since briefing is important for the success of the construction process, it has emerged and developed in parallel with the development of the construction industry, thus, a considerable number of studies was established to improve a comprehensive briefing.

Different individuals or organizations worldwide have commonly used the term briefing in construction projects. Diverse meanings and limitations of the same term are used to define briefing. Briefing as a process is understanding an organization's needs and resources and matching them to its objectives and mission (Blyth & Worthigton, 2010). The process starts with the inception stage and does not finish after completion, where it also runs through the evaluation. The brief can be thought of as a product of every stage. It is a formal document that is the medium for expressing or communicating the objectives and needs of the client (CIB, 1997). The documents may be fixed, or they may be updatable documents according to the changing circumstances of a project. Briefing as a stage is a set of defining objectives, methods, and instructions in which different parties have a role. It is also a sub-part of the whole briefing process. Briefing is a tool for collaborative work for clients, contractors, and designers. The aim of the involvement of the client and contractor in the briefing is to collaborate with the contractor to promote innovation and efficiency in planning and production (Ryd, 2004).

A good briefing is not only about the right checklist for communication between client and architect, but it is also related to understanding the human dimension. It has to be a concern for defining the correct structure of the briefing process of a project. The human dimension is about the experience and skills of people involved in the briefing. Barrett listed rule-based and knowledge-based failures in the briefing. He provided suggestions for improvement (P. S. Barrett et al., 1999): (1) brief takers' reliance on experience, information has to be presented in a way that is acceptable to individuals, (2) individual brief taker may be appropriate instead of architect, (3) client should be involved more to provide the necessary checks to ensure the brief is on course, (4) a neutral computer-based expert system may back up the weak areas of professionals. The suggestions pointed out are the development issues for the briefing process. It is important to figure out a comprehensive briefing framework. Stating and using a comprehensive framework to think and criticize is hard. However, the briefing should be taken into consideration for the needs of the requirement management of client/end-user, planning for the instructed cost and time, and management of the information and knowledge of project stakeholders, the evaluation of the process and project in terms of feedback into the future and the success of a project (Çalışkan & Pekeriçli, 2023). Briefing starts long before the project and continues long after and connects to the beginning of a new project, as shown in Figure 1. It, therefore, continually feeds the upcoming projects by collecting the knowledge through a project lifecycle. The briefing process is segmented into three principal stages for better understanding and implementing briefing in a construction project. With the continuity of briefing from the pre-project stage to the post-project stage, it has a vital role in managing the activities and knowledge of any project execution. Thus, the project stakeholders' involvement in briefing by comprehensive frameworks should be sustained.

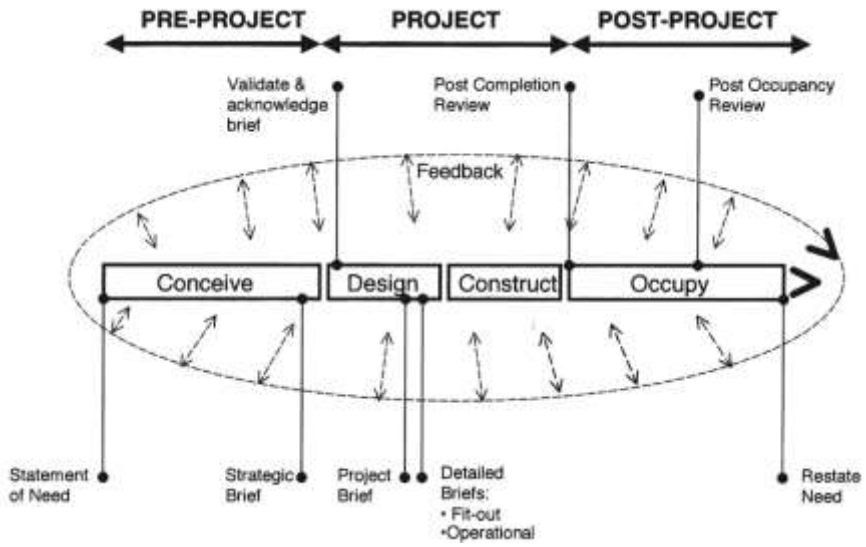

Figure 1. Three principle stages in briefing (Blyth & Worthigton, 2010)

Knowledge Dimension for the Construction Industry

The knowledge Management (KM) approach has been increasingly recognized by business sectors and researchers by giving organizations competitive advantages for meeting objectives against the requirements (Tan et al., 2007). KM is a continuous process of managing knowledge to create value, increase productivity, and gain competitive advantages with identification, optimization, and active management by meeting existing and emerging needs (Quintas et al., 1997; Webb, 2017). The construction industry generally deals with a project which is 'unique', and should act analytically against problems and difficulties in the context by making decisions with valuable knowledge. This requires a specialized management of knowledge processes. KM can be defined as a continuous process of managing knowledge to create value, increase productivity, and gain competitive advantages with identification, optimization, and active management by meeting existing and emerging needs (Quintas et al., 1997; Webb, 2017) where knowledgeable project stakeholders are supported by an integrated information and data sources, resulting with a more satisfactory decision-making process (Chimay J. Anumba, Charles O. Egbu, 2005). Understanding of the decision-making process increases in parallel with the conversion from data to information and information to knowledge

From the various views of knowledge, it can be stated that knowledge is processable, developed, and created by experience and sharing, composed of formal or unformal framework, based on understanding individuals, groups, or systems and giving capacity to someone or something for action and reaction. Knowledge Management (KM) deals with the flow and framework of knowledge and knowledge sources in business. There are diverse classifications and typologies for knowledge regarding transferring, industry, or process capability. Only the knowledge aspect of the construction domain is considered within the study's scope. In this regard, the major types of construction project knowledge can be listed (Tan et al., 2010);

- Process knowledge and knowledge about clients,
- Knowledge about legal and statutory requirements,
- Costing knowledge and knowledge about reusable details,
- Knowledge of best practices and lessons learned,
- Knowledge of the performance of suppliers:
- Knowledge of who knows what,
- Knowledge about key competitors, risk management, or sector-specific areas.

The knowledge about the requirements of construction projects is more specified in terms of process, site, client, and regulatory. There is a need for integration and collaborative working between project stakeholders to manage knowledge about the requirements. Types of knowledge about construction project requirements are presented (Kamara et al., 2002);

- Client requirements
- Site requirements
- Environmental requirements
- Regulatory requirements
- Design requirements
- Construction requirements

Requirement Management

Requirement Management is mainly considered in parallel with the briefing process. It is critical for successful construction delivery and is hard to accomplish effectively (Shen et al., 2004). The terms used to gather, analyze, process and test the client's needs define various aspects of the subject. Requirement Management is related to documentation, storage, communication, tracking, and traceability, whereas Requirement Engineering includes elicitation, analysis, prioritization, specification, and validation (Bray, 2002). This subject is generally used in the Software Engineering discipline, which has dealt with requirements more in the last decades because of the rapid technological improvements. The whole process could be identified as requirement processing, and most of the authors assumed that the briefing term is a process of identification, articulation, definition, and registration of design requirements (Pegoraroa & Carísio, 2017).

A continuous process for client requirements is needed to match them to proper design solutions; thus, client requirements processing can be considered within this context. Lack of communication, objectives and decision clarity, client inexperience, end-user involvement, clear communication, and evaluation of solutions for client requirements could be critical factors (E. O. Olatokun, 2017; Pegoraroa & Carísio, 2017). Communication gaps, misunderstanding of client needs, insufficient time, and inadequate identification and representation of needs are barriers to managing requirements in the briefing process (P. Barrett & Stanley, 1999; Blyth & Worthigton, 2010; E. O. Olatokun, 2017).

Computer and Building Information Modelling (BIM) also contribute to the requirement management of construction projects. The activities and related requirements are implemented into spaces by computer processable format that allows better tracking and verification. Converting the written requirements into computer processable formats such as BIM needs more attention, whereas there are studies for the establishment of the ontologies and implementation and solving compatibility problems of software (Baldauf et al., 2020; Ghannad et al., 2019; Narayanswamy et al., 2019; Zhong et al., 2018). However, capturing the requirements before implementing them into the cycle is an important barrier.

RESEARCH METHOD

The research aims to develop a briefing framework to capture, refine, and use the required knowledge and evaluate the proposal for further improvements. Five stages were executed orderly to conduct the study. First, the briefing framework was developed, and needed aspects such as activities, states, user roles, and knowledge classes were designed using Unified Modelling Language (UML) within the literature survey. Then, the proposed framework was converted into simplified graphical version that could be presented to the industry practitioners with a presentation file[1] since they are not UML experts. Three screenshots from this presentation are provided in this paper as figures 7,8,9. The semi-structured interviews were held with architects by presenting this file explaining the proposed framework compared to the former, activities, and outputs. The thoughts and comments of the interviewees were noted and presented under three headings without any decoding or analysis of the text. Discussions through interviews' records were conducted, and a conclusion was presented to underline possible contributions and problems of the proposed system from the perspective of the industry practitioners to underline development areas of the briefing framework. The findings, discussion on findings and concluding statements would be used for improvement of proposed framework and other relational studies with briefing and requirement management.

PROPOSED FRAMEWORK

Designing a comprehensive framework for requirement management in the briefing process that governs all the project stakeholders and project process is a difficult objective to achieve; however, any attempt to develop such a framework by the scientific community and industry practitioners is a valuable contribution. This study develops and offers a continuous briefing process, focusing on capturing the required knowledge- using and reusing it via some methodology and technology. The framework is developed in Unified Modelling Language (UML) and then presented to industry practitioners. UML aims to provide system architects, software engineers, and software developers with tools for analyzing, designing, and implementing software-based systems and modelling business and similar processes (OMG, 2017). This study uses a software package named Visual Paradigm for UML Diagrams (Object Management Group, 2022). The framework is designed to

[1] Web link of file used for Interview (2021), https://www.dropbox.com/s/q25bzxgl990vb93/interview_requirement_2021.ppsx?dl=0

contribute to the requirement management era and will be developed considering the thought and comments of architects in practice.

The proposed framework is presented in UML with activities, use cases, and flow. The main Flow cycle is shown in Figure 2. After initiating a project, the knowledge related to the definition of the project will be clearly stated. This is important for managing knowledge for ongoing sub-processes. The knowledge about the project gathered from different parties is captured with some techniques and then refined for machine and human processing. The structured knowledge is validated and archived for indexing, searching, and reusing. Reuse of knowledge is also a capture of knowledge from a library base which is also validated for new and ongoing projects.

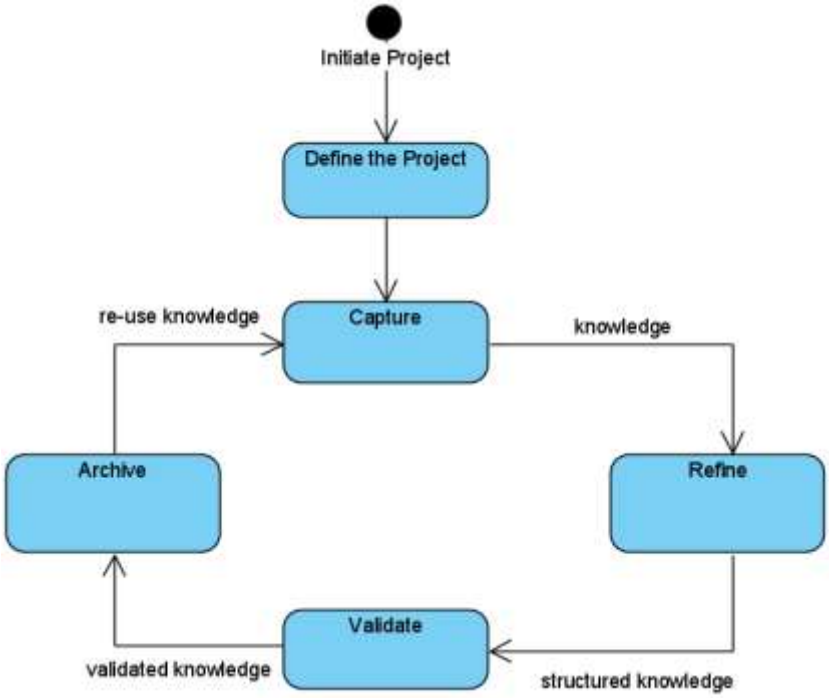

Figure 2. Main flow cycle of requirement knowledge (produced by authors)

In Figure 3, the use-case diagram of the framework is presented. The actors, use cases, and their relationships can be seen in the diagram. Which actors carry out which use cases and which use cases related to others are designed in the proposed framework. By looking into detail, it can be understood as (1) the designer or project manager can be a brief-taker, but the designer should involve in the design briefing process by the creation of a preliminary design model for the design briefing flow (2) the paying client, consultant, and user client should involve the process in the client role, (3) the client has a role in library validation, client briefing, consensus validation, and 3D design briefing.

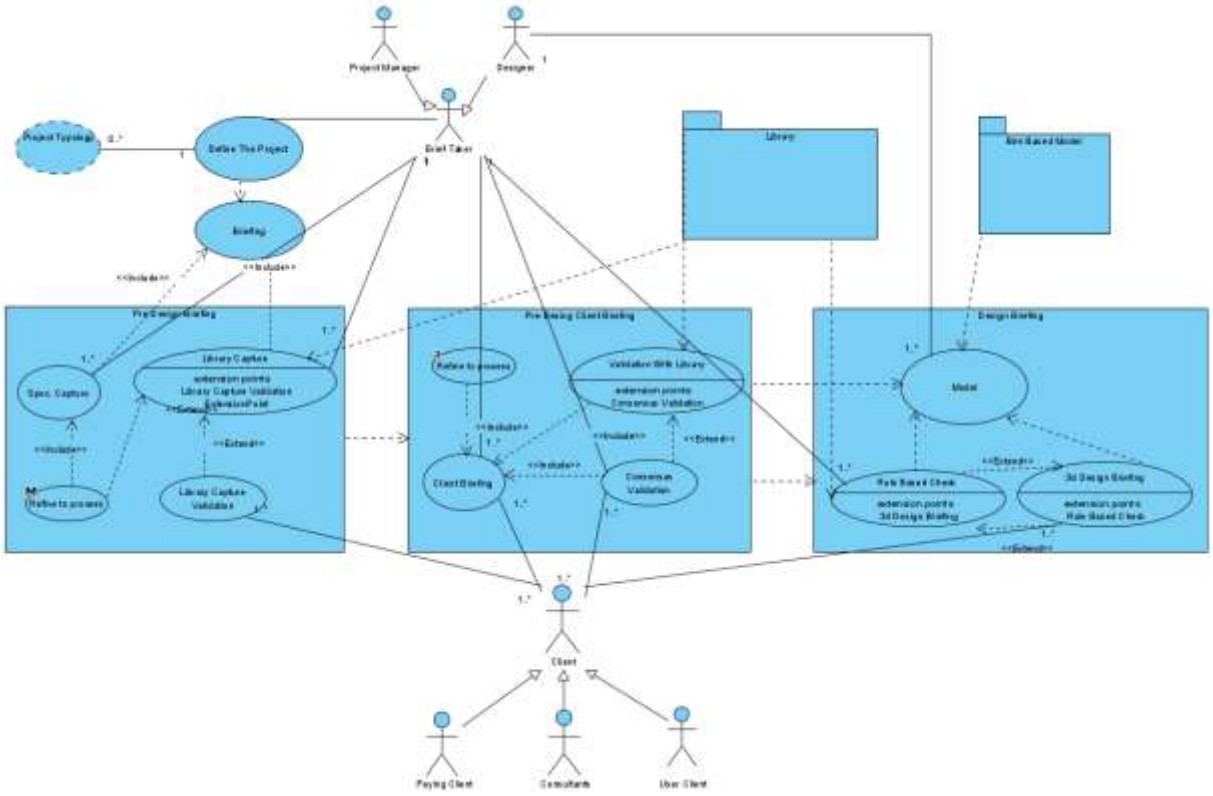

Figure 3. Main use case diagram (produced by authors)

In Figure 4, the knowledge typology and attributes of the library are presented. The level of detail in this figure will be improved and updated as the study progresses. Class and class relations of knowledge captured, refined, validated, and stored in the library are explained with their attributes, operations, and responsibilities. For example, zero or more than zero number of text-based knowledge is part of one or more client briefing knowledge. It has a name, id, entry, effects, typology attributes, search and index operation, and relevancy check responsibility. It is generalized into the library and used in 3D design briefing.

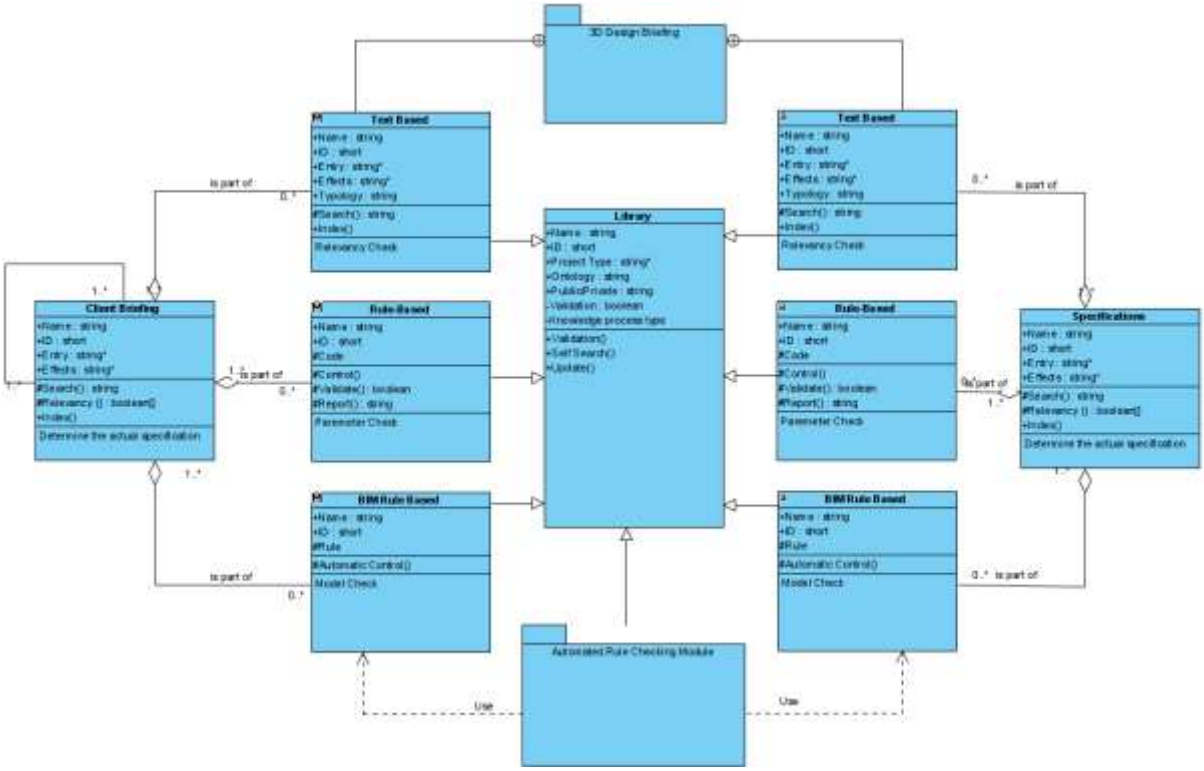

Figure 4. Knowledge library class diagram (produced by authors)

This diagram shows the proposed framework's activities, actions, and relations. Main state machine diagram is shown in Figure 5, which represents the states, activity packages, and relations. The main activity diagram of knowledge capturing in briefing for requirement elicitation and validation is presented in Figure 6. Following these figures, the framework is explained. After defining the project's properties, the pre-design capturing cycles are started. The related knowledge is searched and taken into the project specification class with pre-refinement. This knowledge is refined for the process by generalization, similarity check, and relevancy check and fragmented according to their opportunity to translate in codes that machines can read or convert to rules that BIM tools can use. There are attempts and research for open code generation and sharing related to building codes and specifications that will be searched and used for this study. The specification knowledge that cannot be converted into rules or codes is stored in structured notes. The outcome of this flow and other cycles explained below are archived in temporary and permanent libraries. The temporary library is for the actual project, and the validated knowledge of project briefing is stored in a permanent library for reuse.

According to the project definition, the validated knowledge kept in the library is searched and captured by comparison. The client validates the captured knowledge; if needed, it is updated in the library by the same refinement process. After these two cycles in which there is no significant client involvement, capturing client requirements is started. It should be noted that it will be executed if there is a need to initiate any flow in any flow stop. The knowledge is captured from the client via some techniques such as face to face interviews, meetings, etc., before the refinement process, it should be taken into consensus validation between project stakeholders. Then, it is

refined and validated with the library. The objective and subjective knowledge kept in the library is used for the validation. The knowledge that can be transferred into machine-readable codes and rules can be easily checked and validated; the rest are validated with human effort. The flows explored above are before any design study and objective considering the design proposals. However, there seems to be another flow for capturing and validating more knowledge in project briefing at a more precise level. The reasons behind this state are (1) there is some knowledge related to the experience of the client which is hard to keep in word, (2) there is some knowledge that can be captured and validated better in a 3D model environment resulting from lack of construction project experience of the client, (3) generated and stored rules from the capturing process can be compared and evaluated with Building Information Model precisely. The design activity will be taken in a BIM environment and need a level of detail for rule processing. The main goal is capturing the requirements, not designing the final project. The knowledge stored in the library and related to the actual project is a guide for the designer to generate a BIM model and a guide to the client to evaluate the model according to captured and validated knowledge from previous flows. The BIM model is validated by a rule-based check and 3D-design briefing, and the client briefing data is archived again after the refinement process. The project briefing is completed in a level of repetition of these flows with consensus. The design proposal model may be used for project execution or not. It is a different decision related to the client and designer, but the requirements coming from the client are evaluated and validated with specifications.

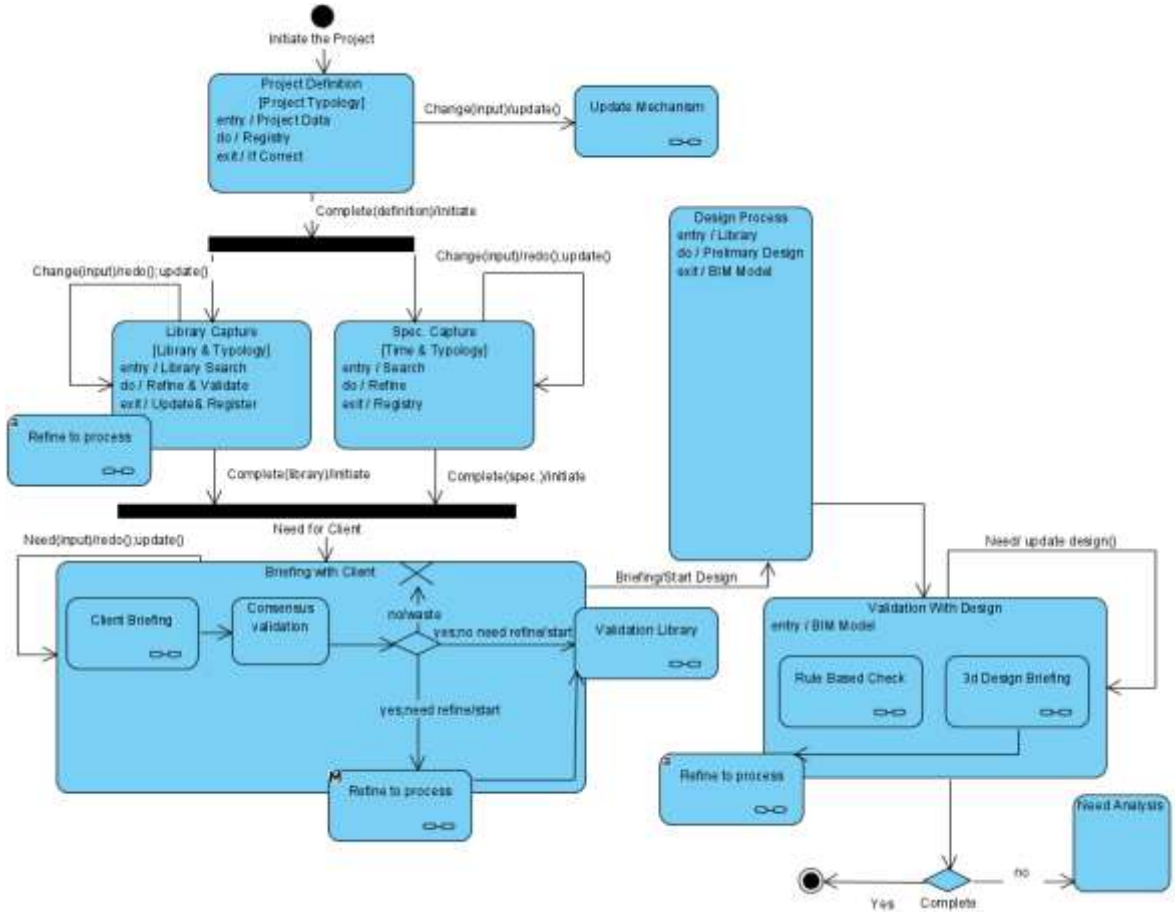

Figure 5. State machine diagram (produced by authors)

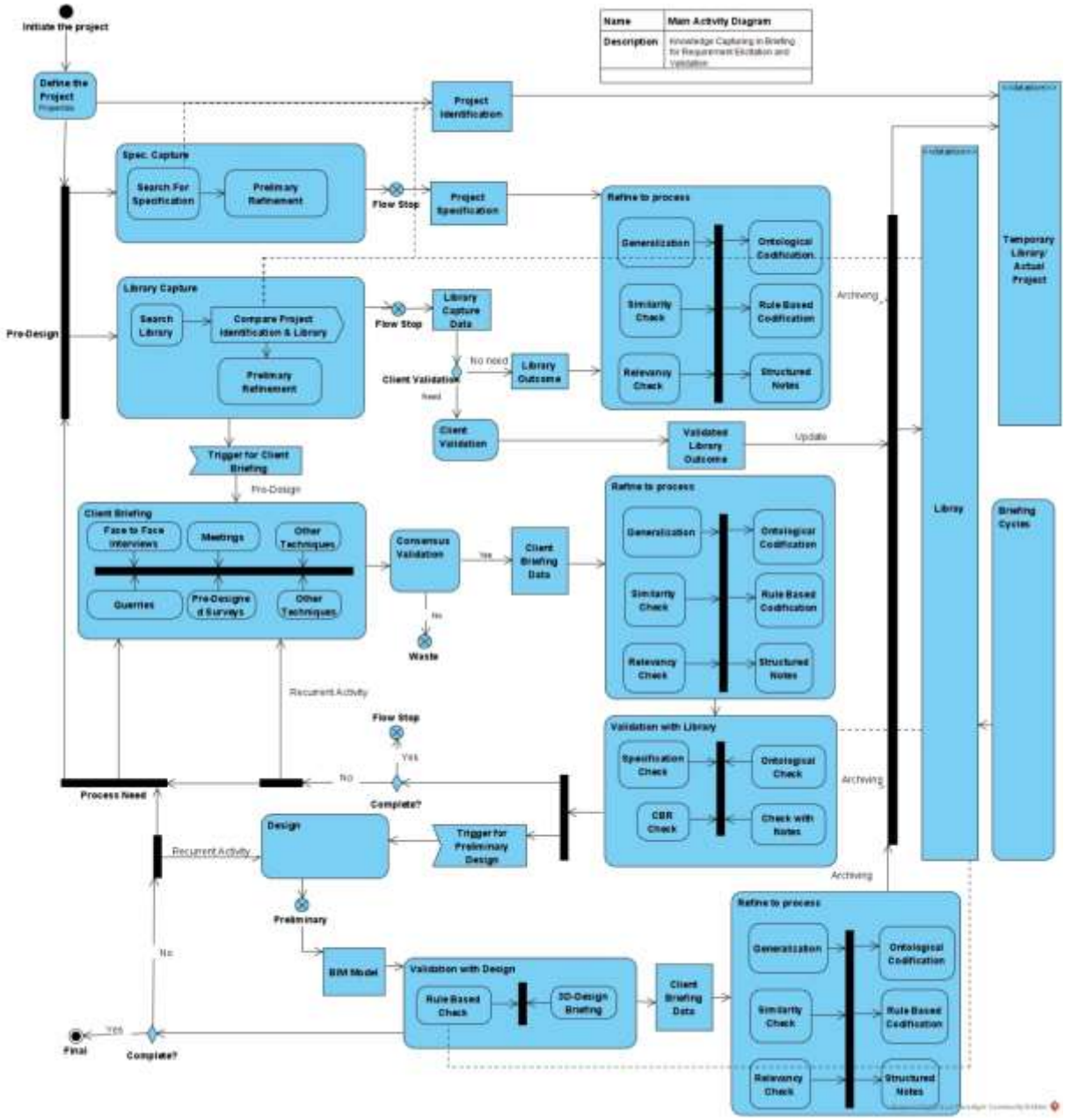

Figure 6. Activity diagram (produced by authors)

The main objectives of the proposed framework are:

1- Capturing specifications into design briefing
2- Provide a developing library base for actual and further projects
3- Reduce the work of capturing and validating knowledge by flow and computer-based process
4- Sustain client involvement in the design briefing process by giving tracking/comparing roles for given requirements
5- Utilize the proper methodology and software for the briefing framework

INTERVIEWS

For research that has implications on and influences from professional practices, surveys and interviews are beneficial for the evaluation of objectives and deficiencies of the study. The questions, the survey structure, and the focus group composition should be designed considering the context of the study. The samples are surveyed through questionnaires or interviews, varying from highly structured questionnaires to unstructured interviews (Bechhofer & Paterson, 2000). The evaluation of a group of people aims to ask for thoughts on the proposed framework and discuss the issue for further studies. Because of not having quantitative measurements on items or articles, interviews are chosen to set the framework. Semi-structured interviews are held with industry experts who partner with or have a design company with at least five years of experience. The announcement and invitation to the interviews[2] were done through TSMD[3]. They were informed about the context at the beginning of the interview. Then, the proposed framework was presented with visuals and a video file that shows basic visual movements and flows with oral presentation.

Figure 7, Figure 8, and Figure 9 are screenshots which were shown to respondents to present the capabilities of requirement management within a proposed framework at the beginning of the interview. 11 interviews were held in the second half of 2021 utilizing online meeting tools with architects who are owners, partners, or managers of the architectural design companies. The average experience of the group is 20 years; 30% of the interviewees has a public client, %70 of them has a public client, and 25% of them uses BIM for their project process at different levels. Their views on three following items were investigated on the framework proposal of requirements: (1) Benefits and Possible Contribution Possible Areas, (2) Possible Problems of Framework Proposal, (3) Comments and Suggestions on Development of the System.

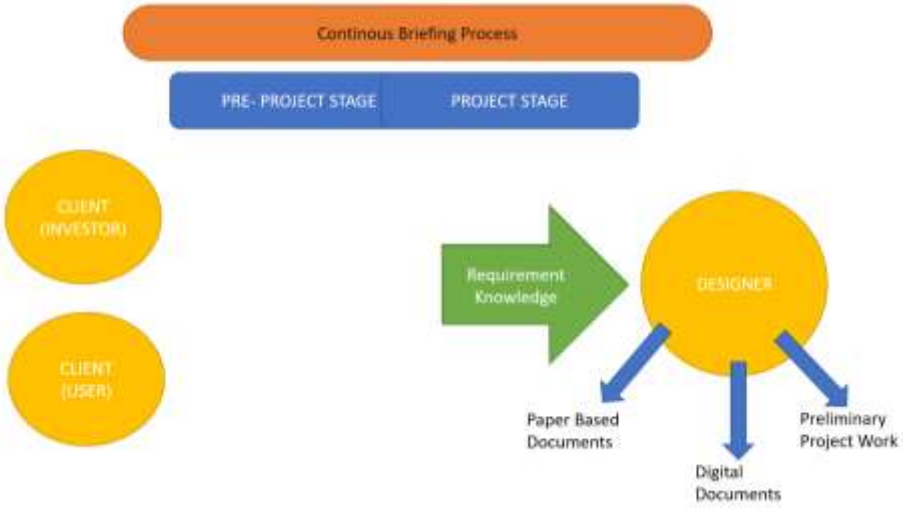

Figure 7. Screenshot 1 (produced by authors)

[2] Approval was taken at 23.06.2021 from METU Ethics Committee with number 254-ODTU-2021

[3] Turkish Association of Architects in Private Practice

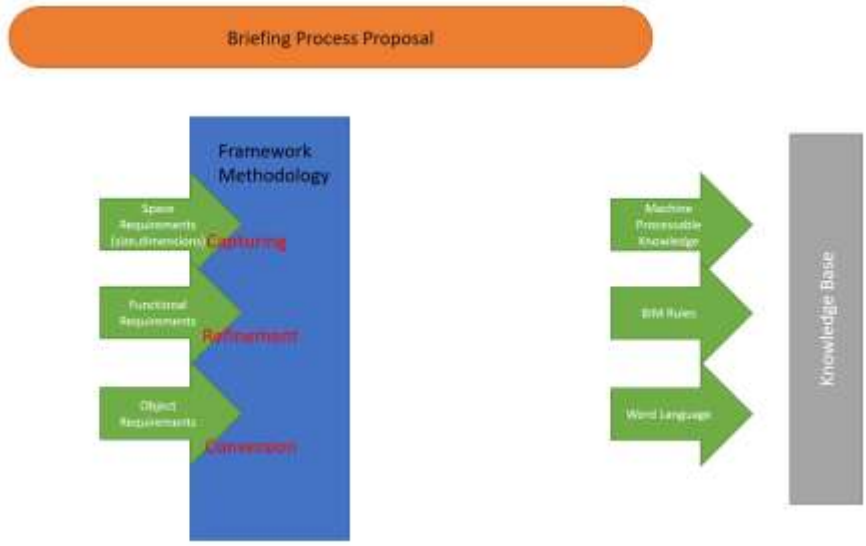

Figure 8. Screenshot 2 (produced by authors)

Figure 9. Screenshot 3 (produced by authors)

Records of the Interview

The comments, thoughts, and recommendations were directly noted during the interviews without any decoding and analysis, and they are presented under three headings below;

Benefits and Possible Contribution of Framework Proposal

- It is a control and tracking system for inexperienced clients.
- Reworks of analyzing requirements and tracking change orders can be reduced dramatically.

- With a knowledge library, dependency to individuals for knowledge will be decreased.
- It may help with the work of inexperienced designers.
- The processes and calculations are done more easily and rapidly by computer.
- If the system can work independently from the designers' experience and time, it significantly contributes to managing the requirements.
- Mistakes, misunderstandings, and differences of interpretation originated by people will be reduced to a minimum level.

Possible Problems of Framework Proposal

- Compatibility problems of IFC and data loss on BIM.
- Every piece of knowledge cannot be coded or transferred into a computer format.
- Hard to change the available procedures and trends in the construction industry.
- There needs to be a level of experience for initiating the system.
- The experience and vision of the designer will always stay for managing the requirements.
- It can only deal with quantitative data with no analysis or inference process.
- There will be needed labour work and experience to execute the system.
- It creates bureaucracy and makes it obligatory in terms of the procedure of project execution. This situation is also considered as a benefit of the system.
- The system needs a high detail level of input, resulting in profit loss due to time.

Comments and Suggestions on the Development of the System

- It is a system for converting the requirements documents into a format that the computer and BIM environment can work
- It is hard to collect data in the project process. The system can be used for refining and storing knowledge after project completion.
- It is a system for analyzing and converting data from the legislation.
- It should have a module for similarity and typology checking
- The designer should have the option to change and interfere in the system due to his/her intentions and approaches.
- The system may be considered in communities and the construction industry with institutional procedures and knowledge.
- There is no situation that a computer cannot solve. There is only a time issue to wait for development.
- Execution of the system differs according to the client and project typology.

Discussions

This section builds up on the outputs of the interviews, reflecting the wisdom of the interviewees on the subject. Benefits and possible contributions of the proposed framework are stated under the section. The tracking and control capability of the system reduce the effects of knowledge level

of individuals. Client experience level and the knowledge of project stakeholders significantly affect requirement elicitation and validation in briefing. A knowledge base that is established as a guide and evaluation information source can reduce the problems related to experience. In this respect, the briefing process can be close to independent of individuals' knowledge level. The experience level of client was also underlined by several researchers for briefing process (Blyth & Worthigton, 2010; E. O. Olatokun, 2017; Pegoraroa & Carísio, 2017), that the proposed framework may contribution for reducing the effect of experience level. Also, inexperienced designers or designers who have lack of knowledge can benefit from a knowledge base. However, it does not mean that all the processes can be done without the involvement of users and designers. Project unique context is related to human perception and actions from experience and knowledge. Machines' computing and learning capabilities can contribute to the process by inferences resulting from complex calculations. The contribution of computer-based system is an important issue that Barrett (1999) stated almost 25 years ago. These calculations are hard to manage by humans in terms of time and mental capacity. Additionally, a ruled system with computer integration can decrease mistakes and misunderstandings between project stakeholders. Misunderstanding or wrong identifications of client needs are prior problems (Blyth & Worthigton, 2010; Pegoraroa & Carísio, 2017), and they result in lacks for clear communication. The capability of computer for identification, representations and management has a important role for knowledge transfer between project stakeholders.

Possible problems of the system were stated by the interviewees under three important headings: compatibility problem of BIM files (machine environment), limits of the knowledge processes, and needed experience level for the usage of the system. The first one is also a contemporary problem in the BIM world: data and meaning loss between different software. Building Smart Community has developed a common file system called IFC and continues to develop and release it for compatibility with different companies' BIM-capable tools (buildingSMART, 2022). The second is related to the dimension of knowledge, and all knowledge cannot be coded or transferred into machine readable format. Humans may need other techniques to understand knowledge and communicate during the project process. Thus, text-based recordings, visual mediums, or some methods like scenario analysis or workshops will stay in the briefing process. The third problem is the need for an experience level of project stakeholders. The experience is related to methodology, not the construction industry directly. Every stakeholder should accept this situation to run the framework. Generally, the client is a decision maker for consideration of the briefing process. So, with the acceptance, a level of bureaucracy will be inserted. It may be a problem or undesired progress for designers or clients.

Comments and suggestions on the proposed system were enlightening the researchers by pointing at some important deficiencies and improvement areas of requirement management. Being industry practitioners, interviewees (architects) have an important role in the issues that are central to this study and can help develop these with their experience. One of the important approaches for briefing is to make it possible to convert the written requirements to a computer-processable format that can be transferred to BIM rules. The studies, development of ontologies and executions of some software continue on this subject. Also, interviewees noted that converting and transferring the knowledge from legislation to BIM environment is important. The compatibility

problems for converting information into computer formats needs more attention (Baldauf et al., 2020; Narayanswamy et al., 2019). The proposed framework is not at the point of development of ontology or method for the improvement of this issue, however it should be noted that some countries use this approach for project evaluations and submissions; researchers try to develop automated systems. Another important comment by the interviewees on the system was related to designers' decision boundary. Whether the system state proper or not, designers should have the option or right to revise the knowledge according to his/her intentions and approaches. Machine or ruled systems may have calculations and recommendations; however, this stays within a boundary that the designer can change and make decisions. Also, the building typology, client type, and project delivery system have a significant impact on the effectiveness of the system. Execution of briefing and systems part should differentiate due to these conditions.

CONCLUSION

The briefing process has diverse functions in the construction process, from the pre-project stage to the completion of construction and facilitation. Requirement management in elicitation and validation with process and progress for the execution is one of the significant objectives of briefing. A comprehensive framework that is designed and developed, and compatible with project typologies between project stakeholders in an intended business environment has a dramatic value for vocational progress. Reaching the ultimate system is difficult; however, process improvements bring some opportunities. With the development of machine environments like BIM, architects and clients can manage project requirements better, in a shorter time, and more collaboratively.

Potential capabilities of the proposed system were stated by industry practitioners, such as independence from individuals, decreased duration and workload with the implementation of machine-based methods, and advantages resulting from the established process of managing requirements by executing a well-defined framework. However, significant possible problems may also originate from similar contexts. Firstly, the experience and knowledge of designers are emphasized. Intervention capability of designers to the system should be provided. Due to design and project's unique situation, architects do not work on the design and their relation via a strict method or quantitative information; activities come from their specific decisions. Secondly, converting and transferring all knowledge into machine processable format is nearly impossible. Dimension of the knowledge affects this process in which some stay text based or not semantic-coded. It is a problem not only unique for construction industry but also evident in other fields. Lastly, using a fixed framework sometimes obstructs the contribution of the individuals. Thus, until a stage where individuals receive benefits, they want the possibility to change, revise or correct the proposed process. These bottlenecks of the study lie in the context of the knowledge and architectural design process. Even if the possible contributions of the proposed framework cannot be neglected, for further development of the briefing framework, the following issues should be considered: (1) the implementation of the experience level of the user to the system should be sustained, (2) a knowledge converting mechanism should be developed due to dimension of the knowledge and performance should be tracked, and (3) the system should allow the users for customizations. These remarks will be reconsidered for the improvement of the briefing proposal. While evaluating and validating the future completed version of briefing proposals, a structured

survey and analysis method should be used for any method like interview or focus group experiment.

This paper states the briefing process and its importance in industry and knowledge dimensions in construction and proposes an initial briefing process framework for requirement management. The framework is evaluated through interviews with industry experts, and discussions on interviews' records is presented. Further work on the development of the system will be done by considering the evaluation of architects and reflecting the research against comments. This evaluation process is also thought to be a briefing process for developing a system with the involvement of users.

Acknowledgements | Teşekkür Beyanı

Thanks to architects for sparing their valuable time and comments.

Conflict of Interest Statement | Çıkar Çatışması Beyanı

Araştırmanın yürütülmesi ve/veya makalenin hazırlanması hususunda herhangi bir çıkar çatışması bulunmamaktadır.

There is no conflict of interest for conducting the research and/or for the preparation of the article.

Financial Statement | Finansman Beyanı

Bu araştırmanın yürütülmesi ve/veya makalenin hazırlanması için herhangi bir mali destek alınmamıştır

No financial support has been received for conducting the research and/or for the preparation of the article.

Ethical Statement | Etik Beyanı

Araştırma etik standartlara uygun olarak yapılmıştır.

All procedures followed were in accordance with the ethical standards.

Copyright Statement for Intellectual and Artistic Works | Fikir ve Sanat Eserleri Hakkında Telif Hakkı Beyanı

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Author Contribution Statement | Yazar Katkı Beyanı

A. Fikir / Idea, Concept	B. Çalışma Tasarısı, Yöntemi / Study Design, Methodology	C. Literatür Taraması / Literature Review
D. Danışmanlık / Supervision	E. Malzeme, Kaynak Sağlama / Material, Resource Supply	F. Veri Toplama, İşleme / Data Collection, Processing
G. Analiz, Yorum / Analyses, Interpretation	H. Metin Yazma / Writing Text	I. Eleştirel İnceleme / Critical Review

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Vol. 7, No. 2, 2024, 341-362 / Cilt 7, Sayı 2, 2024, 341-362 / DOI: 10.37246/grid.1278725

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