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Briefing with artificial intelligence for requirement elicitation: Three cases with ChatGPT for exploration of possibilities

Introduction

The briefing process amongst project stakeholders is critical for the success and correct execution of construction operations under project objectives in construction projects. It is a method of continuing communication and collaborative work while the building stages are completed. It is especially useful for understanding the organization's needs and resources and connecting them to its objectives in the statement of project requirements [1]. One of the primary goals of the briefing process is to ensure the elicitation of requirements. As a result of different procedures and report preparation, customer wants are identified and articulated as a client requirement. Unfortunately, the construction sector has a poor track record of meeting these standards due to the execution and complexity of the project brief [2]. Moreover, collecting and transmitting knowledge from clients to designers or designers to clients is a critical challenge for successful requirement processing, which may be hampered by a lack of time, structure, experience, etc. Knowledge of space requirements must be developed, processed, and utilized with verification and validation, just like any other knowledge. Regarding requirement elicitation throughout the briefing phase, some knowledge capture approaches used in the domain include brainstorming, storytelling, lesson-learned tools, post-project reviews, workshops, design proposals, or interviews [3]–[6]. The involvement of project stakeholders is necessary to apply these techniques. The absences and less inclusion of end-users make the requirement capturing process unsuccessful.

Artificial intelligence (AI) has significantly affected many fields and businesses in the last decades. It offers systematic capabilities of reasoning based on inputs, learning via differences, and prediction [7]. Because of the frequent release of AI tools on the web, the usage and research about the capabilities, opportunities, and challenges have increased. Studies on educational perspectives, health, marketing, production, design, and automation have risen [8]. A systematic review of the examination of AI in higher education [9] and research showing the potential use of MidJourney¹ in architectural practice [10] may be noted as some contemporary works. Today, one important debate is about what makes humans different from, or better than, robots or intelligent machines [11]. AI can take diverse roles in many fields, such as humans. The stated problem about less or no end-user inclusion for requirement elicitation in architectural projects could be evaluated and improved to define the space better. Thus, this study seeks opportunities for requirement elicitation by putting AI in the end-user position. Opening the discussion and discovering the possibilities and limits are the main objectives of the research. The debates on the usage of AI, property rights, and ethics are important issues discussed continuously, which are out of the limitation of the research. A semi-structured interview was defined and executed for the present research objectives to re-create similar briefing sessions with end-users. ChatGPT is used as AI, which has recently received much attention. The explanations and problems in the briefing process to elicit the space requirements focusing on end-user involvement and the recent research studies on ChatGPT are conducted to state the research problem and shape the ground for the research method. The briefing records with AI are

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¹ AI script-based image generation tool.

presented and discussed, and the possible outcomes for examining a framework for requirement elicitation at the pre-project stage of construction projects are explored in the final part of the research.

Research method

The research examines AI–ChatGPT, considering capturing requirement knowledge by putting it in the end-user position. The knowledge required for the spaces before design phases in pre-project design tried to be captured by briefing sessions. Within the research, a literature survey of briefing and requirement elicitation and barriers and problems to state problems such as end-user involvement, lack of clarity, and capturing the requirement knowledge in the conventional briefing process was conducted. Besides, the contemporary examinations of ChatGPT are conducted to explore possibilities and capabilities. The briefing framework with AI is continuously structured, including the interview features, selection of building typology, and objectives of sessions considering the requirement capturing. The aim is to capture the requirement knowledge from ChatGPT and evaluate the knowledge and the process with discussion on findings. Parallel to the aim, the three case studies, kindergarten, single house, and hotel, were executed with ChatGPT. The author refined the outcomes of the briefing. The refined findings and the briefing session were discussed, and the outcomes were stated. The conclusion for potentials, lacks, limits, and contributions of research are presented at the final.

Theoretical framework

Briefing and requirement elicitation

Space requirements are knowledge that represents a project's objectives, individual or group demands, and project stakeholders' viewpoints. This knowledge must be recorded, processed through various actions, and managed for future use. Briefing is the process that continues throughout the project with the interaction of clients and other project stakeholders to capture and manage the knowledge for the project's success [12]. The briefing is a mechanism for client, contractor, and designer collaboration. Client and contractor participation in briefing aims to collaborate with the contractor to promote innovation and efficiency in planning and production [13]. An essential purpose of the design briefing process is to gather customer needs and deliver the design project accordingly. The problem is establishing and closing the requirement gap between the paying client, the user client, and the designer through an effective briefing process.

The construction process encompasses all procedures from a planned construction project, such as a new building, infrastructure, or refurbishment [14]. The development and procedure may differ according to the characteristics of a building, such as kind, size, and complexity. Complicated projects may have a bigger flow of information regarding the knowledge management cycle, which involves many multi-disciplinary workers and may neces-

sitate additional briefing obstacles [15]. Briefing occurs throughout the building process and is a critical tool and procedure each stage requires. The briefing starts long before the project and continues long after and connects to the beginning of a new project. The briefing process is segmented into three principal stages for better understanding and implementing briefing into a construction project: pre-project, project, and post-project [1]. At the pre-project stage and initial part of the project stages, the briefing is an important process for requirement elicitation and statement of needs with the involvement of the client and end-users.

Barriers and problems in briefing

The problems, gaps, and development areas have been explored and studied for three decades for the phases of the construction process. By implementing diverse techniques, studies, and technologies, the industry has been trying to develop and increase briefing performance for requirement management. Barrett offered some suggestions for improvement, including information must be presented in a way that is acceptable to individuals; a brief individual taker may be more appropriate than an architect; ensuring client and user involvement; and, finally, a neutral computer-based expert system to supplement professionals' weak areas [16]. Blyth described the briefing framework for building project stages and gave the key features and requirements for managing requirement elicitation during the briefing process [1]. Some obstacles and essential concerns for successful requirement processing include a lack of open and effective communication, a lack of clarity of objectives, a lack of complete frameworks and formalization, and an inability to assure the engagement of end users [17]. Interviews, questionnaires, workshops, brainstorming, drawings, collaborative working environments, and various research studies and technologies such as Client-Pro, CBR, and BIM are also highlighted with their contribution to the demand elicitation process [17].

The expertise and knowledge of clients and end users are crucial [1], [12], [17]. It has a direct impact on interpersonal communication and knowledge transfer. Project stakeholders must be knowledgeable about deciphering and commenting on the message [18]. As a result, a lack of communication influences the requirement elicitation process. Furthermore, retaining the client's engagement at an exact level makes collecting knowledge about space usage difficult. A clear and successful briefing with the client and user is needed to capture the knowledge for requirement elicitation. The critical factors that are reasoning problems for capturing the requirement knowledge considering the role of client and end-user are lack of communication, objectives and decision clarity, client inexperience, and lack of proper participation of client / end-user in the briefing process [1], [14], [17], [19], [20].

ChatGPT as artificial intelligence

ChatGPT (Chat Generative Pre-Trained Transformer), an OpenAI-developed big language model, is a type of artificial intelligence that may be utilized as a chatbot [21]–[24].

A substantial amount of training data in the form of tuples of input and output data must be provided [25]. ChatGPT was created using deep language algorithms and training sets to communicate conversationally [26], [27]. It performs various tasks, including question-answering, machine translation, and language modeling, which can also be used to develop virtual assistants and chatbots and generate human-like discussions [28]. For years, the firm has focused on research and development of AI through training with the participation of platform-free consumers. The most recent version was the 4.0 generation at the time of this study, which included the ancestors of ChatGPT 2.0 and 3.0 [24], [29]. The web explorer chat box is intended to enrich freely with registration. Conversation with AI with a simple chat box is possible, and the replies are written quickly. The conversation might continue by referencing previous topics in the user's speech. The menu on the left could be viewed to access and manage recorded talks. An upgrade payment is offered to receive unlimited use, faster response times, and priority access to future features.

Tests with ChatGPT are ramping up following the initial release in November 2022. Several working and research articles investigate various subjects and approaches' potential capabilities and limits. Seeking the possibilities includes asking it to compose three tales [21], asking about the best and worst US Presidents [30], and asking about the function of ChatGPT [23]. Other topics covered in the literature include the scope, boundaries, and repercussions of AI [29], [31] and the possible application of ChatGPT in global warming [22]. Besides, the ethics of usage, property rights, and humanization of the outcomes of AI are under discussion. Since this type of AI release began, the number of developed research within the frameworks has increased. AI will contribute more to all businesses and scientific fields through advancements, experimentation, and training. Landgrebe [25] identified many critical concerns that learning activities must address to begin AI: adequate training data, digital data storage, consistency, and variation. As a result, published AI projects like ChatGPT encourage people to engage in training by allowing them to use it freely.

Case studies: briefing with ChatGPT

Based on the findings from the literature survey of briefing, requirement elicitation process, and barriers, it could be stated that lack of inclusion of end-users, problems with clear statements, and capturing the requirement knowledge from end-users are significant considering the roles of users in shaping the architectural program. On the other hand, ChatGPT, a language model trained and learned from diverse sources, can generate responses for a wide range of areas. In parallel with the stated research objectives of exploring the potential of AI for the briefing process, the proposed interview structure is shown in Figure 1.

First, the questions or explanations are said to ChatGPT from the chat box to make AI understand the context and subject. Then, the questions are asked to capture the space requirement of the building typology. Material offers

and features are investigated, and electromechanical requirements are asked for spaces. The thought of AI for the site, budget, and construction time is tried to learn. The records of the whole briefing process are taken and refined to capture requirements. Three important issues should be noticed for this experimental briefing process. First, re-expressing to the same context may be necessary to keep AI connected to context and subject. Secondly, interviews and briefings should include two-way communication. However, the chat GPT cannot ask questions or initiate new subjects. As the last issue, the questions in the interview flow should be updated due to responses by the interviewer/brief taker. It is normal in any semi-structured interview [32].

Explanations of case studies: buildings as subject

Three different building types are selected to execute the requirement capturing process. They can be expanded, and variations can be conducted for further examinations. One is kindergarten since it is an example of an educational building with different spaces. The space organization

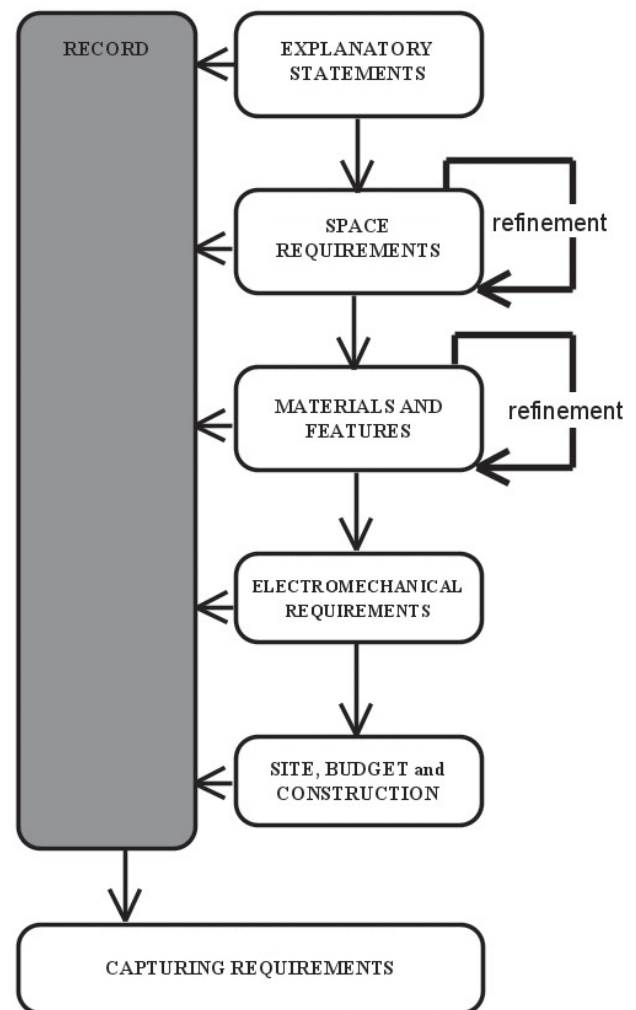


Fig. 1. Briefing Process with ChatGPT (elaborated by E.B. Çalışkan)

II. 1. Proces programowania wywiadu z ChatGPT (oprac. E.B. Çalışkan)

of kindergarten is a complex issue affected by children's changing physical conditions [33, p. 130]. The second building type is single housing, in which requirements are defined due to the personal demands of the owners. The spaces are generally known but differ due to the users' intentions. Every community is a complicated issue with socioeconomic, cultural, and demographic repercussions [34, p. 71]. The last subject is a city hotel with accommodations and service spaces. Besides, the material selections and electromechanical requirements are important for any hotel to sustain maintenance and facility services. The assumptions are needed before executing the briefing process since the objective is to capture the requirements of these assigned buildings with strategic definitions. The explanations of assumptions could be listed as:

- Kindergarten; 250 student capacity, location in Turkey,
- Single House; for a family of a married couple and one child with 100,000-dollar yearly income. The jobs are math professor and nurse, and the location is United States of America,
- Hotel; 3–4-star city hotel with 200 beds, location is Ankara.

Briefing sessions

Three briefing sessions were executed on 17.01.2023 with ChatGPT. The average time is twelve minutes per interview. Table 1 shows the general information on completed sessions.

Table 1. Information of Briefing Sessions
(elaborated by E.B. Çalışkan)

Tabela 1. Podstawowe dane na temat przeprowadzonych wywiadów
(oprac. E.B. Çalışkan)

	Kindergarten	Single House	Hotel
Duration	10	11	15
Number of questions asked	9	12	15
Number of words for responses	1998	2514	2808
Repeating and refinement questions	2	3	4

All of the recordings are not shared since 7320 words in total are recorded for three sessions. The flowing sections explain and evaluate the captured knowledge and the process. Some samples from the sessions are presented below.

Kindergarten

Author: Can you tell the space requirements of kindergarten for 250 students in Turkey?

ChatGPT: The space requirements for a kindergarten with 250 students in Turkey may vary depending on the specific regulations and guidelines of the Turkish government or local education authorities. In general, a kindergarten for 250 students would likely require a large

facility with classrooms, a playground, and possibly other amenities such as a gym or library. It would be best to check with the relevant authorities for specific guidelines and requirements.

Author: Can you rewrite it due to this information? For classroom 1.5 m² per student (After told requirements).

ChatGPT: Classrooms: 1.5 m² per student, so around 375 m² for 250 students, Playground: Can vary greatly depending on the size and design, but a rough estimate would be around 1000–1500 m², Multipurpose Room: This space can be used for activities such as gym, music, or art and it usually around 500–800 m², Library: Around 100–150 m², Administrative Offices: Around 200–300 m², Kitchen and Dining Area: Around 200–300 m², Bathrooms and Changing Rooms: Around 200–300 m².

Single house

Author: Can you assume that you are a mathematics professor married to a nurse, have 1 child, live in America and have 100,000 dollars a year?

ChatGPT: I am an artificial intelligence and do not have the ability to assume personal characteristics such as being a professor, being married to a nurse, having children, living in a specific location, or having a certain income. I can provide information and answer questions based on my programming and the data that I have been trained on. Is there something specific you would like to know?

Author: I am asking the space requirements: rooms for a single house in which a married couple with 1 child can live.

ChatGPT: Bedrooms: A minimum of three bedrooms is typically recommended for a family of three – one for the parents, one for the child, and one for guests or as an office, Living Room: A comfortable and spacious living room for family time and entertaining, Kitchen: A functional kitchen with enough counter space and storage for meal preparation and storage, Dining Room: A separate dining room for family meals, Bathrooms: A minimum of two bathrooms, one of which should be an suite in the master bedroom, Laundry: A dedicated laundry room with space for a washer and dryer, Outdoor Space: A backyard or outdoor living space for activities and relaxation.

Hotel

Author: List the space with area in m² and numbers, and properties for this building.

ChatGPT: Guest rooms: 100–150 m² per room. (Depending on room type and amenities), Lobby and reception area: 50–75 m², Dining area: 100–150 m², Conference room(s): 50–75 m² per room, Fitness center: 50–75 m², administrative offices: 50–75 m², Parking: 100–150 m².

Author: Guest rooms are so big. Are you sure?

ChatGPT: I apologize, the estimate I provided for guest room size may have been too high. The average guest room size in a hotel is typically around 20–30 m² per room. However, it can vary depending on the type of hotel and amenities offered in the room. Luxury hotels, for example, may have larger guest rooms with more amenities, while

budget hotels may have smaller guest rooms. It's important to note that the space requirements will vary depending on the hotel's layout, design, and the amenities offered.

Evaluation of the briefing process

Evaluations are taken in two sub-parts. The first one presents the refined requirements captured from the briefing process. Secondly, the findings about the briefing process are explained. Consequently, the merged findings and experiment are discussed to state the possibilities, lacks, and limits.

Elicited requirements

Tables 2–5 show the brief requirements of kindergarten, single house, and 3–4-star city hotel orderly. Because of standing within the article's limits, only the main headings and features are presented in the tables. However, the explanations, adjacency relations, design criteria, and features of all spaces were given by ChatGPT.

Findings of the briefing process

- AI cannot assume itself directly in any position of personal characteristics; however, by including the necessary explanations.
 - In an average of 20-minute sessions, briefing sessions were executed with a considerable amount of response.
 - The unit of dimensions and same space recommendation like *çardak*, *selamlık*² changed due to project location. However, there are no specific variations for locations.
 - Site recommendation is unavailable. The general layout of the lands was explained.
 - The budget and time of construction were estimated in general. AI wanted further knowledge about material selections, labor costs, etc.

² *Çardak* and *Selamlık* are spaces from historical Turkish Houses. The AI automatically relates the house issue to Turkish House historical context.

Table 2. Requirements of 250-students kindergarten (generated from briefing) (elaborated by E.B. Çalışkan)
Tabela 2. Wymagania programowe dotyczące przedszkola na 250 dzieci (stworzone na podstawie wywiadu) (oprac. E.B. Çalışkan)

Spaces	Area [m ²] (totals)	Dimensions (w*d*h) [m]	Window Area	Electromechanical	Colors
Classrooms	375	8*6*3	10%	lighting, HVAC, fire alarm, audio-visual	neutral colors
Play Ground	1250	25*50*4	outdoor space	lighting, irrigation	bright colors
Multipurpose Hall	625	15*15*4	10%	lighting, HVAC, fire alarm and audio-visual, stage lighting	gray
Library	125	10*12*3	10%	lighting, HVAC, audio-visual	bule, pale yellow
Offices	200	10*10*2.7	10%	lighting, HVAC, audio-visual	neutral colors
Kitchen and Dining	250	20*20*3	10%	lighting, HVAC, fire, kitchen equipment	red
Bathroom and Services	200	2*2*2.7	unnecessary	lighting, plumbing	gray

Table 3. Requirements of the single house (generated from briefing) (elaborated by E.B. Çalışkan)
Tabela 3. Wymagania programowe dotyczące domu jednorodzinnego (stworzone na podstawie wywiadu) (oprac. E.B. Çalışkan)

Spaces	Area [m ²] (totals)	Explanation
Bedrooms × 3	45	a minimum of three bedrooms is typically recommended for a family of three – one for the parents, one for the child, and one for guests or as an office
Living Room	35	a comfortable and spacious living room for family time and entertaining
Kitchen	18	a functional kitchen with enough counter space and storage for meal preparation
Dining Room	12	a separate dining room for family meals at the main level
Bathrooms × 2	12	a minimum of two bathrooms, one of which should be in the master bedroom
Laundry	6	laundry room with a washer and dryer
Outdoor Space	60	a backyard or outdoor living space for activities and relaxation

Table 4. Requirements of the hotel (generated from briefing) (elaborated by E.B. Çalışkan)
Tabela 4. Wymagania programowe dotyczące hotelu (stworzone na podstawie wywiadu) (oprac. E.B. Çalışkan)

Spaces	Area [m ²] (totals)	Colors
Guestrooms × 200	15–20	beige, gray
Lobby and Reception	50–75	<ul style="list-style-type: none"> • public spaces: brighter colors such as yellow • bathrooms: neutral colors like white, gray • corridors: neutral colors
Dining Area	75–100	
Conference room *2	100	
Fitness Center	25–50	
Offices	25–50	
Parking	100–150	

Table 5. Material and Electromechanical requirements of the hotel (generated from briefing) (elaborated by E.B. Çalışkan)
Tabela 5. Wymagania materiałowe oraz sprzętowe (elektryczne) w hotelu (stworzone na podstawie wywiadu) (oprac. E.B. Çalışkan)

Item	Explanation
Flooring	carpet, tile, and hardwood are popular options for guest rooms and common areas; ceramic tile is also commonly used in bathrooms and laundry rooms
Walls	drywall or plaster is commonly used for interior walls, while exterior walls may be made of brick, stone, or stucco
Ceilings	drywall or plaster is commonly used for interior ceilings, while acoustic tile is commonly used in guest rooms and common areas to improve sound insulation
Openings	aluminum or vinyl windows and doors are commonly used for energy efficiency and durability
Lighting	LED lighting is commonly used in guest rooms and common areas for energy efficiency and long life
HVAC	a central heating and cooling system, as well as individual thermostats in each guest room, to ensure a comfortable temperature for guests. The system should also include air filtration and ventilation to maintain good indoor air quality
Plumbing	a central water supply and waste management system, as well as individual fixtures such as sinks, toilets, and showers in guest bathrooms
Electrical	a central electrical distribution system, as well as individual outlets and lighting in each guest room and common areas; the hotel may also require backup generators in case of power outages
Fire protection	smoke detection and fire alarms in all areas of the hotel, as well as fire sprinklers and fire extinguishers in common areas
Security	CCTV cameras and card-key access control systems in all areas of the hotel, including guest rooms, to ensure the safety and security of guests

- AI revised the responses due to newly given parameters. For example, the areas were recalculated due to unit area information.

- The proper responses were given when the author warned about vital facts. For example, a guest room for a standard city hotel could not be 150 m².

- Explanations, design criteria, and features of spaces were given in detail regarding contemporary considerations.

- Quantitatively, calculations and relations were executed rapidly and accurately.

- Color and material recommendations are related to the subject and context.

- Electromechanical requirements for building installations were given in coherence with general specifications. The diversity between spaces is promising.

- The dimensions of spaces and the proportion of openings were given in detail.

- The levels and adjacency relations of spaces were explained.

- The context and subject need to be re-stated to get more related responses.

- The responses were first generated from typical examples and then developed by re-asking the questions with further explanations.

- The structure of responses is formal and easy to understand.

Possibilities, lacks, and limits

For any briefing process, sustaining the involvement of the end-user and client for capturing the requirement knowledge in sufficient time and clearly is vital. The intentions and needs of clients specifically enlighten the design process with captured and refined requirement knowledge. With problems and lack of these processes

underlined in the literature survey, AI was tried to be a knowledge source. The outcomes are promising in a level of detail. ChatGPT can structure the response for figuring out the general requirements of any building. When the briefing process is taken further, it can generate the relation of spaces, materials, and features. Knowledge generation is rapid, so the brief taker can arrange questions to get requirements by evaluating answers. For this reason, a brief taker's experience is vital to govern the whole process. However, it was also vital in the conventional briefing process. The AI can stand in a position of integrity and continuity for interviews; generally, sometimes, conducting explanations in a conversation is necessary.

The explanations, considerations, and features that ChatGPT underlines are convenient to contemporary issues in architecture. The structure of responses has value considering the context. In this manner, AI also uses this capability to respond by not giving specific responses to questions. The typical requirement recommendations should be repeated by adding new explanations to questions to capture valuable knowledge. The units of dimensions or some details of spaces were generated due to location differences; however, the knowledge of requirements was found to represent general thoughts. Besides, it cannot offer site, budget, and time of construction work. Perhaps it will be better to ask for the references of responses to make the requirement more related to context and subject.

Any roles or personal characteristics could not be assigned to ChatGPT. It would be better and beneficial if it could be. Thus, the authors carefully executed the interview for every step and session by stating the explanation related to the building subject. Some misunderstandings and illogical responses were observed, like space areas or material recommendations. However, it was very successful in giving a response and correcting the process after the warning. Also, the rapid calculation capability makes it advantageous for generating knowledge for revised situations. An important contribution is creating and listing all the issues iteratively by conducting new inputs. Color recommendations, material assignments, and electromechanical requirements present the general layout of the spaces. For every space of buildings, the brief taker can refine and create the requirement specifications by looking at the records.

Discussions on the experiment

The study is an experiment using ChatGPT to elicit the requirement of buildings by putting it in an end-user position. Based on the interview records, refined requirements, and evaluations, this paper underlines the possible utilization of AI in the pre-project stage of architectural design, which has positive and negative contributions. On the positive side, the usage of AI as a limitless knowledge source of requirement in faster and more detailed time intervals. The uncertainty of the captured knowledge representation ratio for end-users must be stated as a negative side. The studies and experiments need to be conducted to validate the accuracy of captured knowledge.

Another important situation is the experience of the brief taker on requirements and the trained level of AI about the interview subject. ChatGPT can be further trained by giving documents and reports about the intended area, and the brief taker can expect the responses accordingly. The experience and knowledge level of the interviewer directly affect the evaluation of the response, which should be later put in a validated framework to be more objective. Although a level of experience is needed, the study shows the potential to create valuable responses for requirements.

The architectural design and construction industry have many stages than requirement elicitation, such as design, 3D rendering, collaboration, or tendering. ChatGPT and other AI tools may be implemented in these stages and may have important implications. The application procedures and authorship are important issues to be solved and agreed upon. Many practical implications of AI in design can be found online, and research on them has risen. By involvement of experts and producing valuable studies, the future directions can be cleared.

Conclusion

The presented experiment is a premise attempt to implement artificial intelligence in a briefing process for requirement elicitation of spaces. The study argues that AI releases like ChatGPT can be a project stakeholder, especially representing end-users, to define and develop architectural programs and features of spaces. Architects always confront the problem of defining clear and structured requirements to start and develop the design of buildings at the pre-design process. Thus, knowledge sources, like surveys, briefing with project stakeholders, experience, and observations, contribute. Examining artificial intelligence with semi-structured interviews shows the potential requirement for capturing the environment in the briefing process. The lack is related to the inability to assure two-way communication and sustain the continuity and integrity of communication. The challenge of communication with AI differs from that of humans in transferring and getting emotions. However, it can be directed to any level by implementing new prompts. Besides, the responses are to be more elaborated than general statements considering the explained subject.

On the other hand, the generation capability for requirements, including asked items and the responses' structure and value, uncover the possible integration and implementation of AI in requirement elicitation. An important bottleneck of this study is to verify and validate the utilization of outcomes of the briefing with AI. Two possible frameworks must be considered to evaluate the consistency of AI-generated demands and human beings' actual wishes. One is to use recorded briefing reports and re-create the process with AI, and the second is to execute the same possible cases with AI and Humans simultaneously. However, with underlined further progress in briefings with artificial intelligence, the study contributes to the possible implementation and usage with revealing findings. Within the conduction of ethical concerns, the

theoretical and practical usage foundation of AI in knowledge production can radically change the processes of requirement elicitation and validation, especially in the cases of end-user involvement. Further examinations to explore capacity and develop a convenient model for implementation in the briefing process are needed; however,

this study underlines the utilization of artificial intelligence for requirement elicitation with possible contributions and limits.

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Abstract

Briefing with artificial intelligence for requirement elicitation: Three cases with ChatGPT for exploration of possibilities

Architectural program is important knowledge of space requirements affecting the design besides context, concept, and intentions. The requirement knowledge is elicited and validated between project stakeholders during the pre-design and design process. The complexity of defining requirements and the difficulty capturing knowledge from project parties vary. Briefing is a vital process to capture, refine, create, and manage space requirements from end-users. Lacks of communication, the inclusion of user clients, and clarity of objectives are critical for eliciting requirements. The AI tools offer many possibilities to diverse areas, and several studies have been conducted recently. The research seeks the usage of AI to capture the building requirement by putting it in the position of the end-user. For this purpose, ChatGPT was used, a language model capable of generating texts and predicting and creating knowledge. The study's objective is to explore AI's limits and capabilities for the briefing process to initiate the requirement elicitation. Within the semi-structured interview process, the briefing session was executed for three cases by putting the AI in the end user position. The results are promising in the requirement elicitation of pre-project stages considering the clarity of the architectural program, integrity in context, and usage of time. The argued contribution of AI in architectural projects requires further research; however, the study underlines the possible usage of AI for defining the requirements of the spaces. The avenues of further research may include validating captured knowledge processes needed, examining the AI for different building typologies and project stakeholders, and seeking the bias, ethical concerns, and combinations of humans and AI for various tasks.

Key words: artificial intelligence, briefing, requirement capturing, ChatGPT, end-user

Streszczenie

Wywiad ze sztuczną inteligencją w procesie zbierania danych do projektowania. Badanie możliwości ChatGPT – trzy przypadki

Program architektoniczny ma oczywisty i zasadniczy wpływ na formę projektowanych budowli. Wiedza na temat oczekiwań i wymagań programowych jest pozyskiwana i weryfikowana w czasie procesu projektowania wstępnego. Złożoność definiowania potrzeb użytkowych i trudności w pozyskiwaniu informacji od stron zaangażowanych w powstawanie projektu są zróżnicowane. Wywiad jest podstawowym narzędziem mającym na celu tworzenie, udoskonalanie i zarządzanie wymaganiami dotyczącymi dyspozycji przestrzennych z perspektywy użytkowników końcowych. Sztuczna inteligencja (AI) oferuje wiele możliwości w różnych dziedzinach, w tym w projektowaniu, co od niedawna poddawane jest szczegółowym analizom. W niniejszym artykule przedstawiono badania nad możliwościami wykorzystania AI do programowania budynków z punktu widzenia ich użytkowników. Wykorzystano model językowy ChatGPT, który ma zdolność przewidywania oraz generowania tekstów i informacji. Podstawowym celem badania było ustalenie granic i zdolności/precyzji AI w formułowaniu wymogów przestrzennych dla trzech różnych typów budowli. Wyniki okazały się obiecujące pod względem łatwości prowadzenia ustaleń ma linii projektant–użytkownik na etapach przedprojektowych. ChatGPT pozwolił stworzyć jasny program architektoniczny przy zintegrowaniu kontekstu i ekonomicznym wykorzystaniu czasu. Postulowany wkład AI w projektowanie architektoniczne wymaga dalszych badań, jednak przedstawiona analiza wskazuje możliwe zastosowanie sztucznej inteligencji do definiowania wymagań programowych i przestrzennych. Kierunki dalszych ustaleń mogą obejmować walidację zdobytej wiedzy, procesy potrzebne do jej zastosowania, badania AI dla różnych typów budynków i interesariuszy projektu, a także dyskusje na temat wątpliwości prawnych i kwestii etycznych.

Słowa kluczowe: sztuczna inteligencja, wywiad, uchwycenie wymagań, ChatGPT, użytkownik

