An exploratory study on expectations from AI-based automated scheduling

AN EXPLORATORY STUDY ON EXPECTATIONS FROM AI-BASED AUTOMATED SCHEDULING

Irem Dikmen[1] and Murat Cevikbas

[1] *School of Built Environment, University of Reading, Whiteknights, Reading, RG6 6AB, UK*

[2] *Isparta Applied Science University, Faculty of Technology, Block E12, 32260 Isparta, Turkey*

Scheduling is a complex process that requires information from several sources, coordination between teams, and experience of using various methods and tools. Automated scheduling (AS) may facilitate the process and provide a potential solution for the skills gap experienced in the construction industry. In this paper, we will present initial findings from a funded research project about development of an AI-based AS tool for building projects. As a part of the needs analysis, semi-structured interviews were conducted with 12 construction professionals to identify challenges with the traditional scheduling process, requirements from, and potential concerns about an AI-based AS tool. Unavailability of data, procedural difficulties such as extracting information from several documents and poor communication between different disciplines were highlighted as the current challenges. Major expectations from the tool are primarily about automated analysis of various documents and better coordination of information exchange. Judgemental reasoning required for scheduling tasks and limited explainability of AI raise concerns about the performance of a fully automated tool and decreases trust.

Keywords: Artificial intelligence; construction planning; digital technology; time

INTRODUCTION

Scheduling is a data-driven process that requires information retrieval from different sources and communication within the company as well as project stakeholders (Soman and Molina-Solana, 2021). Standards, technical specifications, project reports and company guidelines are among the several documents that are used in developing baseline schedules. Information extraction, interpretation and categorisation process requires significant amount of time. Due to fast-track projects increasingly seen in the construction industry, preparation of a baseline schedule that effectively reflects the project scope and meets stakeholder expectations is challenging, often leading to planners overlooking critical project details and input from different disciplines. Project disciplines are often reluctant to contribute to the planning process due to their workload (Winch and Kelsey, 2005). Project planners are expected to manage the complex information gathering process, utilise effective methods and tools for scheduling, and ensure effective collaboration between project teams despite time related and organisational challenges (Abou-Ibrahim *et al.,* 2019). Scheduling involves development of a work breakdown structure (WBS), identification of

[1] i.dikmen@reading.ac.uk

Dikmen, I and Cevikbas, M (2025) An Exploratory Study on Expectations from AI-Based Automated Scheduling, *In:* Thomson, C and Neilson, C J (Eds) *Proceedings of the 41st Annual ARCOM Conference,* 1-3 September 2025, Abertay University, Dundee, UK, Association of Researchers in Construction Management, 69-78.

activities, estimation of durations, defining relations and constraints, resources levelling and carrying out network calculations using methods such as Critical Path Method (CPM). Processes are iterative, require different types of data and knowledge and optimisation. Scheduling is an exercise under uncertainty which requires forecasting and incorporating risk impacts into time plans. Forecasting is another knowledge-intensive process that requires information gathering about project, company and external factors and collaborative efforts to make sense of uncertainty. Artificial intelligence (AI) may provide a possible solution to deal with complexity and uncertainty in projects, increase efficiency and effectiveness of scheduling tasks.

AI is defined as systems that display intelligent behaviour by analysing their environment and taking actions with some degree of autonomy to achieve specific goals. AI provides a solution for automating data-intensive tasks such as scheduling because it can handle large amounts of data with speed, accuracy and consistency. It can process thousands of documents in seconds, analyse and learn from data. For example, for scheduling purposes, AI can carry out document analysis to understand scheduling requirements and be trained on labelled data where experts have previously applied preferred scheduling principles. If optimisation is required, AI can balance trade-offs by using constraint-based optimisation models. Based on their findings from a Delphi study with a panel of 52 project management experts who reflected on future potential AI applications in project management, Holzmann *et al. (*2022) argue that top-ranked functions for AI integration are mainly about scheduling such as creating a Work Breakdown Structure (WBS), project budget, updating project progress, identification of scope deviations, and allocation of tasks to project teams. Pan and Zhang (2021) also demonstrate through empirical research that AI can handle operational challenges of scheduling. Felicetti *et al. (*2024) suggests that AI is moving beyond solely enhancing operational efficiency to changing the cognitive tasks in project management.

Müller *et al. (*2024) argue that integration of AI into project management is a transformative trend that is reshaping the industry by referring to findings of a questionnaire that 76% of the participating professionals agree that AI will reshape project management. According to this study, project scheduling is one of the primary areas through which AI impacts efficiency, accuracy, and decision-making. Although there are several studies reported in the project management literature about AI applications for scheduling, majority is technology oriented and demonstrate how an AI method or algorithm can be used for a specific scheduling task. One popular area of research is duration prediction by AI. Among these studies are artificial neural networks (Pewdum *et al.,* 2009), and hybrid AI models (Yaseen *et al.,* 2020). Another research area is using AI methods to support a single scheduling task, such as WBS development. Amer *et al. (*2022) developed a deep learning-based natural language processing (NLP) tool to learn relations between activities. NLP that enables computers to understand, interpret, generate and respond to human language is a widely used AI method to extract key information from reports, topic detection and classification, understanding trends and detection of contradictions and similarities. The requirement of considering several reports at different stages of the scheduling process makes NLP an appropriate method to for scheduling purposes. Several researchers demonstrated how NLP can be used for scheduling such as Wang *et al. (*2022) for information extraction from BIM, Hassan *et al. (*2023) to digitise scope of work requirements and Dikmen *et al. (*2025) for automated contract analysis to estimate risk in projects.

Although there are individual applications of AI using specific documents for a given scheduling task, research on expectations of schedulers from an AI-based automated tool, and perceptions on its potential challenges and benefits are missing. An AI based tool can analyze and interpret project documentation, extract information from relevant databases to estimate scheduling variables, can be trained to identify patterns/rules, and facilitate collaboration between project stakeholders. However, identification of which "documents", "information" sources, scheduling "variables", "rules of thumb" and "processes" that can be facilitated by AI and perceptions on risk and benefits of project schedulers, require further research, which is the aim of this paper. AI-based models that are not just adding to the body of academic knowledge but can also be applied in real-world practice are needed (Darko *et al.,* 2020). Within this context, this research was designed using a design science paradigm that aims to understand needs of potential users to develop an AI-based tool that would provide value for practitioners.

METHOD

Initial findings of an on-going research project that aims to develop an AI-based automated scheduling tool are presented. Design science paradigm that is extensively employed in information systems research (Hevner *et al.,* 2004) serves as the methodological framework for the project to develop a tool through iterative steps guided by practice. Using the practice theory, the research investigates the actuality of project-based working as proposed by Cicmil *et al. (*2006), particularly project schedulers' tasks, context-specific routines and rules of thumb. The research process unfolded across three steps: problem identification and goal setting, development of the tool and evaluation. In the initial step, needs assessment was conducted via interviews with 12 construction professionals experienced in scheduling. The findings from needs assessment are used to determine required functions of the tool and AI methods appropriate for these functions. Research questions at this step are R1. What are the processes, data/documents, and principles used by schedulers? R2. What are the current challenges of scheduling process? R3. What are the expectations of users from an AI-based automated scheduling tool? R4. What are the perceptions of users on benefits and challenges of an AI-based tool?

Experts were selected based on their experience in scheduling, particularly in international projects. The criteria used were minimum bachelor's degree in construction engineering and management related fields, minimum of 5 years of hands-on experience in scheduling, and minimum of 3 years of experience in international markets where the experts were selected by non-probability sampling. 25 experts who meet these criteria that have either existing professional relations with the research team or those identified from professional social networking platforms were invited. The profile of 12 scheduling experts who accepted to participate in this study is given in Table 1.

Semi-structured interviews were conducted online with participants who are in different parts of the world (in English). Initially, a definition of AI is given with a couple of examples of AI methods such as NLP, ML and GenAI. The questions were directed to experts in three different sections. Section 1 requested demographic information, Section 2 asked about current practices of scheduling, utilisation of data and documents, and challenges of the scheduling process. Section 3 explored their expectations from an AI-based automated scheduling tool, as well as possible concerns. On average, an interview took approximately 90 minutes. Interviews were

conducted till the data saturation was reached, recorded and converted to text. A manual thematic analysis was conducted. Spreadsheets are developed to organise quotes according to the identified “process/task”, “documents and data” and “requirements” as “themes”.

Table 1: Profile of the experts participating in semi-structured interview (IC: Experience in the International Construction, PE: Experience in Planning)

Expert ID	Personal profession	Education	Years of experience	Location
E1	Executive manager	Civil Engineer	IC: 30, PE: 25	Turkey
E2	Project manager	Civil Engineer	IC: 28. PE: 25	Turkey
E3	Technical office manager	Civil Engineer	IC: 10, PE: 12	Turkey
E4	Planning manager	Civil Engineer	IC: 12, PE: 20	United Kingdom
E5	Senior associate	Civil Engineer	IC: 26, PE: 22	USA
E6	Contract manager	Civil Engineer	IC: 22, PE: 12	Saudi Arabia
E7	Planning manager	Civil Engineer	IC: 08. PE: 03	Saudi Arabia
E8	Senior planning engineer	Civil Engineer	IC: 06. PE: 03	Turkey
E9	Program Controls Director	Civil Engineer	IC: 14, PE: 14	Saudi Arabia
E10	Senior consultant	Civil Engineer	IC: 13. PE: 13	United Kingdom
E11	Director	Mechanical Engineer	IC: 15, PE: 45	United Kindom
E12	Cost control manager	Civil Engineer	IC: 15. PE: 12	Qatar

FINDINGS

Documents and information sources used for scheduling

Table 2 depicts findings structured in a way that it summarises the "processes", "documents and data" and "principles/requirements" as stated by the participants. It demonstrates that different types of information sources and documents are used for each scheduling task. There are fundamental documents as well as others that provide useful information on requirements, preferences and control points. For example, for WBS development, Bill of Quantities (BoQ) is the core source of information. However, if a BoQ is not prepared according to standards such as the Master Code or the New Rules of Measurement (NRM), WBS development becomes challenging. Laws and regulations, tender schedule and previous project data are used to develop WBS. Use of contract documents are mentioned by all the interviewees at almost every phase of baseline scheduling, mainly General Conditions of Contract (GCC), Particular Conditions of Contract (PCC), Questions and Answers at the tendering stage, BoQ, Specifications, Drawings, Tender Schedule, Method Statements (MSs) and Scope of Work (SoW). Reports prepared for the project, such as the Lenders’ Report, cash flow analysis and estimated budget, Environmental Impact Assessment Report are also among the documents used to develop the baseline schedule. Company procedures and guidelines for scheduling (if they exist), scheduling standards and principles (e.g., Society of Construction Law), laws and regulations such as Labour Law and Customs Law are mentioned as critical documents that are used by the schedulers while preparing the baseline schedule, especially during duration estimation and defining constraints and activity relations. Minutes of Meetings (MoMs) between project stakeholders, especially with the Client are also used to extract critical information about constraints and preferences. Majority of the interviewees referred to company databases and historical records to estimate durations and contingency. Expectations from an AI-powered tool is primarily to analyse and interpret several documents to facilitate project understanding.

Use of BIM for scheduling

11 out of 12 interviewees mentioned that usually BIM is not ready at the baseline preparation stage, and it is not used. Schedulers also pointed out that using 4DBIM

software capability is limited, it requires more data and not practical. Specific software, such as Primavera, is usually defined in the contract, thus must be used as a contractual obligation.

Table 2: Requirements for scheduling tasks

Tasks	Requirements
Developing the Work Breakdown Structure (WBS)	• Use WBS – if standard formats are used. • Optimise level of detail – neither too detailed nor too broad • Check any contradictions between Bill of Quantities (BoQ) and other documents • Ensure that WBS and CBS are similar for better cash flow management • Learn from previous projects that are similar • Support collaboration between different project disciplines and stakeholders • Take consent of the owner • Check consistency of WBS with tender schedule, laws and regulations
Identification of activities	• Use Technical Specifications for activity names • Use minutes of meetings (MoM) for owner requirements • Consider all relevant laws and regulations
Activity milestones and constraints	• Use contractual documents to identify any constraints • Use the tender schedule for milestones • Use MoMs to identify constraints imposed by the owner
Allocation of resources	• Calculate the quantities and check consistency of measurements • Refer to method statements (MS) for resource requirements
Assignment of costs	• Check the type of payment method (unit price or lump-sum) • Check with the cash flow submitted to owner and financer
Calculation of duration (using productivity rates and based on time constraints)	• Use local laws and regulations (E.g. Labour Law) • Use company procedures and guidelines for constraints • Rules of thumb • Use of historical data to estimate productivity rates and adjust according to current project
Risk assessment and contingency estimation	• Check method statements to identify risks • Use laws and regulations to identify specific risks such as environmental, health and safety and social risk • Add contingency due to weather conditions. • Use previous project data to estimate delay. • Use risk register to incorporate risk impacts on durations.
Identification of relationships (hard and soft logic)	• Identify relations using contract documents and technical specifications • Use company procedures about scheduling principles • Use MoMs with owner and other project stakeholders • Check standards (eg. Society of Construction Law) • Use data/input from different disciplines • Refer to regulations (such as safety permits) and laws
Setting the calendar	• Use the labour law (working days and holidays) • Understand owner requirements from MoMs
Adjustments considering the contractual completion date and milestones	• Take the milestones and completions dates from contractual documents • Carry on iterations to meet the contractual completion date and milestones
Resource levelling	• Learn resource limits and preferences for different project disciplines using MoMs • Check the capacity and resource availability in the company • Check with allocated budget and cash flow in pre-project documents

Requirements and expectations from AI for different scheduling tasks

Automated WBS development require using several documents including BoQ, technical specifications and coordination between different project disciplines to check its relevance. It also requires input from users for optimum results such as level of detail. "Determining the level of detail in the work schedule is a critical issue. If it is too detailed, the work schedule becomes unmanageable in a very short time. However, if the level of detail is too low, the critical path loses its significance. Therefore, WBS levels should be optimised to ensure that the project can be effectively controlled and monitored." (Expert 2)

> Expert 5 highlighted that they try to create a WBS that closely resembles CBS for better project control and management. Consistency of WBS with other contract documents such as the tender schedule should be also checked (Expert 3).

Some companies use historical project data to develop the WBS and then organise coordination meetings to check whether it reflects requirements of different disciplines and stakeholders.

> "We take advantage of similar projects we have undertaken to develop the WBS levels. WBS of a similar project, if exists is a good source for understanding the nature of a project. Then, we conduct workshops with different project disciplines in the company and meetings with project stakeholders before we finalise the WBS. This is a must to maintain alignment, coordination, and commitment throughout the project execution." (Expert 9).

The importance of the role of coordination and communication was mentioned by all of the experts almost for all steps of scheduling, which is also found as one of the challenges. Experts agree that the biggest challenge they face is to bring the project disciplines together and hold Baseline Schedule Meetings. Expert 5 also mentioned that even if they manage to organise these meetings, meetings are not productive as "divisions are reluctant to take responsibility, and they do not have enough knowledge of the project." The same kind of problem is expressed by another interviewee as follows:

> "It is very difficult to bring people together in meetings and discuss the baseline schedule efficiently because of lack of expertise, communication skills, sometimes conflict of interests between divisions and stakeholders exacerbate this problem. As the project grows, these problems increase geometrically, not linearly." (Expert 6)

Experts agree that relevant laws and method statements play an important role in defining the project scope, but due to time challenges, sometimes these are ignored.

> "Method statements include details of materials and equipment such as mobile cranes and drills to be used, which are critical for duration estimation and resource planning, however, these documents are usually overlooked due to time limitations." (Expert 3)

Estimation of durations using productivity rates is an exercise that requires several types of data. The expectation from the automated tool as mentioned by most of the interviewees is to learn from similar projects. However, data is limited.

> "A project in Algeria may not have the same man-hours as a project in England. Moreover, even in the same location, we may not be able to pour a cubic meter of concrete at the same productivity rate during different external factors. Unit man-hours vary depending on the region, the type of job, local worker productivity and site constraints. I believe that an AI-based tool that can learn from data and analyse the factors affecting productivity rates to identify patterns can provide much more reliable estimates to be used in baseline schedules." (Expert 3)

Experts also mentioned about different company guidelines and procedures, such as procurement procedures (Experts 3, 4) and scheduling handbook (Experts 10,12) that are used while assigning durations, as well as rules of thumb, as given below:

> "Activity durations should be manageable. Long-duration activities are difficult to monitor and control. I avoid using long durations for activities, such as no longer than two weeks." (Expert 9)

As indicated by Expert 10, "if the company does not have a database, the scheduler's experience becomes extremely important". An expectation mentioned by Expert 10 is a rule-based system where the rules are either learned by AI or set by experienced schedulers themselves.

Another data-driven process is risk assessment. Following are some quotes from the interviewees about documents containing relevant risk information.

> "Method statements should be referred to identify risks and add contingencies. e.g., if a method statement indicates that work is to be carried out with a crane, windy weather can be a risk." (Expert 2)

> "In the UK, law and the EIA regulate the protection of wildlife and nature during the construction process, number of badgers, water voles, etc constitute a source of delay risk." (Expert 10)

Expert 6 mentioned about challenges of organising risk workshops to assess project risks considering different aspects of the project such as technical, contractual and economic to provide useful input to estimate buffer.

Assigning relationships between the activities require consideration of several documents, as Expert 3 explains as below:

> "Contract documents and company scheduling procedures determine the relationship types to be used in scheduling. Additionally, meetings conducted with the owner may establish rules for relationship types. We use specific standards such as the Society of Construction Law, … In most of our projects, the use of the Start-to-Finish (SF) relationship is prohibited, as stated in the IMP/IMS Guide, as well as by the Society of Construction Law. (Expert 3)"

Soft logic, also known as preferential logic or discretionary dependencies, is based on best practices, preferences, expert judgment and usually decided by a consensus between different project teams. Setting the soft logic requires consensus between members.

> "Technical specifications may regulate mandatory relationships among activities. For example, fire alarm system and CCTV tests cannot be performed without permanent energy. While the planning department assigns mandatory physical relationships between activities using technical specifications, discretionary relationships (soft logic) are usually set through meetings with project disciplines." (Expert 2)

All interviewees explained scheduling as an iterative process that involves teams coming together to discuss resource allocation options, which cannot be done effectively due to time limitations. Checking the integrity of baseline schedule includes review of several issues as well as experience, judgemental reasoning.

> "As a common practice, schedulers check the project longest path, near critical paths, activities without predecessors, activities without successors, activities with constraints, negative lags, etc. to check whether the schedule makes sense given the project nature before finalising it." (Expert 10)

Benefits and concerns about using AI for scheduling

All the interviewees mentioned about "automated document analysis" as the major benefit. Expert 8's comment shows that even the whole scheduling process is not automated, there can be some time and cost savings valued by the scheduler by some level of automation.

> "We spend enormous amount of time for discussing the activity relationship in meetings with other departments. The meetings are not result-oriented sometimes departments try to establish dominance over other teams. Even if only relationships like hard logic can be linked automatically by the AI-based tool, time and money lost in meetings can be reduced and more consistent work programs can be created." (Expert 8)

One of the interesting discussions in interviews was about availability of data and whether an automated tool can be ever possible without enough data to train the AI. Four of the interviewees raised their concerns about lack of data in construction, unreliability of AI trained with limited data leading to lack of trust. Concerns were about whether AI can mimic human decisions that require judgmental reasoning. This

group of experts including Expert 4 and Expert 5 raised serious concerns about a fully automated scheduling tool.

> "There are several documents in construction projects, significant or less important, and sometimes maybe conflicting that are used to develop the work schedule. For example, if we want artificial intelligence to use every file to determine the constraints, AI can assign constraints to jobs that should not be there. Human input will be needed to prioritise factors and make reasonable adjustments" (Expert 4)

Another concern was about lack of explainability and uncontrollability of the tool leading to serious consequences, which have been reported by other researchers (Kumar *et al.,* 2023). The "black box" nature of AI makes it a possible source of unpredictable errors.

> "As a disadvantage, the schedule created by this type of tool may not be sufficiently checked, errors may be noticed too late, potentially leading to problems, cost increases and conflicts between the parties. For example, a purchase item that has a wrong date may result in serious cost and time implications" (Expert 3)

The other group of experts, smaller in number including Expert 6 and Expert 8, were very positive about AI. This group trusts that AI can interpret the information, identify patterns and relations that could not be done by humans due to complexity, thus positive about an AI tool with minimum human input. This aligns with a previous study by Dacre and Kockum (2022) that as the complexity in projects increases, perceived benefits of using AI gets higher as it is assumed that AI reduces some of the unknowns.

DISCUSSIONS AND CONCLUSIONS

Based on the findings from interviews, the major processes that can be supported by the AI-based tool are identified as; retrieval of documents and other information sources needed for a given scheduling task, automated document and data analysis to estimate scheduling variables such WBS, activities, durations, relations, constraints and buffer, carry out iterations to optimise time and resources, check consistency with documents such as standards and company procedures and also rules of thumb learnt by AI and/or set by the users to make necessary adjustments (R1). Major challenges are document analysis and collaboration (R2). Findings summarised in Table 2 provide the information required for the forthcoming steps of the research project (R3). For example, selecting the AI methods to be used for different purposes, such as NLP for document analysis, a rule-based system and/or deep learning methods to understand scheduling patterns from previous projects. Concerns such as lack of transparency mentioned by the schedulers highlight Explainable AI as a possible solution. Use of GenAI and chatbots to facilitate task automation, information retrieval and team communication will be considered. Findings from this study can be used by other researchers aiming to develop similar tools. However, it should be mentioned that findings reflect opinions of only limited number of project schedulers and cannot be generalised. We are planning to conduct action research in a construction company to understand how schedulers act and learn in practice and the role of institutional, cultural and behavioural factors in the next steps of the artifact development.

As a summary, AI is considered as a powerful technology to automate some of the critical tasks of scheduling with reasonable or no human input leading to significant time savings and increased efficiency. However, there is a considerable distrust among project schedulers in AI mainly because they suspect that AI may not perform well as it lacks judgmental reasoning and cannot be trained due to limited amount of

data (R4). Our findings highlight that human intervention is still needed for scheduling where AI is conceptualised as a collaborator for increased productivity rather than a manager with full automation. As Lavagnon and Pinto (2025) highlights future research is needed for deeper understanding of the "complementary" role of AI, which is also demonstrated by our findings. Other research avenues about use of AI in scheduling could be exploring cultural and organisational contexts for AI adoption, alternative models of human-AI teaming in projects, possible change in project management roles and demonstrating actual benefits and challenges of using AI in practice.

ACKNOWLEDGEMENTS

The financial support provided by Turkish Scientific and Technological Research Council is kindly acknowledged.

REFERENCES

Abou-Ibrahim, H, Hamzeh F, Zankoul, E, Lindhard, S M and Rizk L (2019) Understanding the planner's role in lookahead construction planning, *Production Planning and Control*, **30**(4), 271-284.

Amer, F, Hockenmaier, J and Golparvar-Fard, M (2022) Learning and critiquing pairwise activity relationships for schedule quality control via deep learning-based natural language processing, *Automation in Construction*, **134**, 1-24.

Cicmil, S, Williams, T, Thomas, J and Hodgson, D (2006) Rethinking Project Management: Researching the actuality of projects, *International Journal of Project Management*, **24**(8), 675-686.

Dacre, N and Kockum, F (2022) *AI for Project Management*, Association of Project Managers, Available from: http://www.apm.org.uk/v2/media/44idgo5i/apmaiinproject-management-final.pdf [Accessed 26th July].

Darko, A, Chan, A P C, Adabre, M A, Edwards, D J, Hosseini, M Z and Ameyaw, E E (2020) Artificial intelligence in the AEC industry: Scientometric analysis and visualisation of research activities, *Automation in Construction*, **112**.

Dikmen, I, Eken, G, Erol, H and Birgonul M T (2025) Automated construction contract analysis for risk and responsibility assessment using NLP and machine learning, *Computers in Industry*, **166**.

Felicetti, A M, Cimino, A, Mazzoleni, A and Ammirato, S (2024) AI and project management: An empirical investigation on the appropriation of generative Chatbots by project managers, *Journal of Innovation and Knowledge*, **9**(3).

Hassan, F, Le, T and Le, C (2023) Automated approach for digitalising scope of work requirements to support contract management, *Journal of Construction Engineering Management*, **149**(4), 1-9.

Hevner, A R, March, S T, Park, J and Ram, S (2004) Design science in information systems research, *Mis Quarterly*, **28**(1), 75-105.

Holzmann, V, Zitter, D and Peshkess, S (2022) The expectations of project managers from artificial intelligence: A Delphi study, *Project Management Journal*, **53**(5), 438-455.

Lavagnon A I and Pinto, J K (2025) Casting a long shadow: On the death and abiding influence of Daniel Kahneman in shaping project management theory and practice, *International Journal of Project Management*, 102681.

Kumar, D D, Pal, S C, Sri Manoj Bonam, V, Katari, P and Thota, S (2023) AI-assisted project management: Enhancing decision-making and forecasting, *Journal of Artificial Intelligence Research*, **3**(2,) 146-171.

Müller, R, Locatelli, G, Holzmann, V, Nilsson, M and Sagay, T (2024) AI and project management: Empirical overview, state of the art and guidelines for future research, *Project Management Journal*, **55**(1).

Pan, Y and Zhang, L (2021) Roles of artificial intelligence in construction engineering and management: A critical review and future trends, *Automation in Construction*, **122**.

Pewdum, W, Rujirayanyong, T and Sooksatra, V (2009) Forecasting final budget and duration of highway construction projects, *Engineering, Construction and Architectural Management*, **16**(6), 544-557.

Soman, R K and Molina-Solana, M (2021) Automating look-ahead schedule generation for construction using linked-data based constraint checking and reinforcement learning, *Automation in Construction*, **134**.

Wang, N, Issa, R R A and Anumba, C J (2022) NLP-based query-answering system for information extraction from building information models, *Journal of Computing in Civil Engineering*, **36**(3).

Winch, G M and Kelsey, J (2005) What do construction project planners do? *International Journal of Project Management*, **23**(2), 141-149.

Yaseen, Z M, Zainab, H A, Salih, S Q and Al-Ansari, N (2020) Prediction of risk delay in construction projects using a hybrid artificial intelligence model, *Sustainability*, **12**(4), 1-14.