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EVALUATION OF RISK-BASED COMMUNICATION MANAGEMENT IN PT XYZ DESIGN BUILDING PROJECT TO IMPROVE TIME PERFORMANCE

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ABSTRCT

The design and build project delivery system is increasingly adopted in government-funded construction projects in Indonesia due to its integrated approach in combining design and construction under a single contract. However, miscommunication and coordination failures remain common, often resulting in project delays and inefficiencies. This study aims to evaluate risk-based communication management in design and build building projects at PT XYZ, with the objective of identifying communication patterns, key stakeholders, and risk factors that significantly impact time performance. A qualitative-descriptive method was used, supported by expert validation from senior professionals with extensive experience in the field. Data were collected through structured questionnaires and archival documentation, and analyzed using content validation techniques to map project stages and activities. Findings indicate that communication breakdowns, especially during early contract phases and design coordination stages, are critical risks that affect project timelines. The study identifies four key phases—Adjustment, Design, Construction, and Closing—each with specific activities and communication flows validated by experts. It also highlights that insufficient stakeholder engagement and delayed information dissemination are core contributors to miscommunication. The implications of this research emphasize the necessity of implementing a structured, risk-based communication strategy to enhance time performance and reduce disputes in design and build projects. The results offer practical guidance for improving project management frameworks, and suggest the integration of proactive stakeholder communication and monitoring tools in future projects.

INTRODUCTION

The world of construction is always evolving as time goes by. One of these developments is the emergence of various *delivery methods* in the construction world such as *design and build* contracts that combine the design and construction phases into one single contract. This method

emerged in the 20th century in response to the need to improve collaboration, efficiency and flexibility in construction project management in order to save time and cost, while also reducing conflicts between design and construction teams (Gould & Joyce, 2003). According to Tran, Nguyen, & Faught (2017), the design and build *concept method* continues to develop as a *delivery method* in the construction market (Tran et al., 2017). The total *revenue of* design and build *projects* in the USA and international markets was $43 Billion in 2002 and $92 Billion in 2012 (Holder Construction, 2012). Thus, the emergence of *design and build* (DB) projects has become a replacement for traditional projects, which have become prevalent, especially in the public sector (Ohag et al., 2023).

Construction with the design method in Indonesia is increasingly encouraged both at the central, regional, state-owned and private government levels (Kim, 2019; Trihatmoko & Susilo, 2023; Widojoko, 2023). This phenomenon is seen as a trend that attracts attention in the Indonesian construction industry (Jaelani, 2017; Ofori & Toor, 2012; Ryhanisa & Sukmono, 2023). How many examples *of design and build building projects* in Indonesia are the construction of the MRT HUB Simpang Temu Dukuh Atas Building, the construction of the TOD Pondok Cina Apartment and the Semesta Mahata Tanjung Barat Apartment.

The Design and Construction Method in Indonesia has also been regulated in the Regulation of the Minister of Public Works and Public Housing Number 1 of 2020 There are several significant differences between the Minister of PUPR Regulation No. 1/2020 and the PUPR Regulation 12/2017.

In this case, there is indeed no government regulation that regulates Operational Cooperation (KSO) between the design consultant and the contractor, it is left to each party to make a cooperation agreement. KSO, which will later become an attachment to the contract (Ellis et al., 2021). Planning consultants should not be subcontractors but equal partners in the KSO. Consultants cannot sacrifice quality just to maximize profits. Because after all, the planning consultant will also be responsible in the event of a building failure (Santorella, 2017).

Regarding the application of design and construction method regulations which are still new in the Indonesian construction industry and there are no binding regulations related to KSO between design consultants and contractors (Mardiaman & Mubarok, 2017). Therefore, communication and coordination between employers, design consultants, and contractors are an important thing as the object of this research (de Blois et al., 2011; Liu et al., 2017; Mintrop, 2020).

In the midst of the rampant use of the *Design and Build* system , an evaluation is needed related to conventional project management that has been implemented so far, one of which is to review special project management for projects with this *Design and Build* system (Carboni et al., 2024). This is because the main purpose of choosing a *Design and Build* contract is to provide the benefit of good communication, which occurs between the design team and the construction team. Good collaboration between the design team and the construction team can speed up the project, cutting the overall project time. Good communication provides early input in the design phase, such as input consisting of construction analysis, engineering value, and use of subcontractors (Gould & Joyce, 2003) and Design *and Build Contracts are* also expected to minimize the occurrence of disputes due to the reduced number of parties involved compared to conventional contracts (Lam, Cheung and Ng, 1999). PT XYZ as one of the contractors of State-Owned Enterprises is involved in working on the *design and build* project. There are 4 projects in 2022 - 2024.

Where in the four projects there are a number of facts found related to time performance. Where of the four projects, there has been an addendum to extend the time from the initial plan with an extension range of 4 – 11 months and there is one project that is still in the process of implementation with delays as depicted in figure 1.1. This is allegedly due to the weak coordination between the parties directly involved in the project and coordination between *stakeholders* (*end users,* operational and maintenance parties, and others).

Poor communication and coordination is the biggest cause or root of the problem because it greatly affects the change in the scope and speed of the decision process. According to Aigbavboa, Thwala & Mukuka (2014) there is a common point to the problem of construction projects related to employers, consultants, and contractors, namely weak communication and coordination. According to Sackey (2021), one of the predominant risk factors in project delays is the lack of communication between stakeholders. Where poor communication and coordination that affects changes in the scope and speed of the Decision process will have an impact on time performance as happened in the *design and build* project at PT XYZ. The cause must be found in terms of communication and coordination. According to Hossain & Chua (2014) The reduction in the total execution time and the amount of *rework* work depends on the level of accuracy of the initial information that is the initial input in the design process, continued by Mansour, et al. (2023) mentioning that the communication model aims to eliminate ambiguity with risk-based communication during the construction process taking place under conditions of uncertainty. This will not leave room or only a small space for the emergence of unplanned risks.

The impact on project delays is divided into 3 levels, the first is the micro impact (project) where construction costs (direct and indirect costs) on work related to extension time. According to Asiedu & Ameyawi (2021), the extension of project time, which also impacts the cost of time-related activities on a project and according to Al-Kharashi & Skitmore (2008), the longer the completion period will lead to overhead and expense costs. The second level is the impact of mezzo (company) will make *cash flow* and company capital will be delayed due to design changes that cause projects to be hampered. According to Al-Kharashi & Skitmore (2008), the delay will have an impact on the entire capital of the company will be trapped in a project and the last level of project delay is the macro (national) impact where the investment of government funds or SOEs will be disrupted and the target start time of operations on the National Strategic Project will be hampered. According to Alenazi, Adamu & Al-Otaibi (2022) delays have an impact on increased *capital expenditure*/*capex*, financial losses for investments and delays in handover and use by *end users* and according to Al-Kharashi & Skitmore (2008) delays will have an impact on lost revenue) that have been planned in advance on the investment so as to interfere with the realization of the feasibility of the investment that has been calculated in advance.

Based on the description of the research solutions above, the evaluation of technology and methods in communication management is considered to be able to solve problems by combining earlier and *real-time* communication management for the design process, plus risk communication methods that communicate the risks being faced to the *risk owner* and the impact parties throughout the construction process take place because dynamic projects such as *design and build projects* are in conditions of uncertainty.

Previous studies relevant to relationship models as well as factors affecting time performance and quality in construction projects have been conducted in different countries with different approaches and focuses. For example, Xie et al. (2022) in the UK identified five major

communication barriers that contribute to time management risks. In the United States, Ukoha (2022) found that communication strategies that include clear messaging and regular engagement are highly influential in improving project performance. Another study by Mavuso and Agumba (2016) in South Africa highlighted eight important communication factors that underpin the success of construction projects.

Furthermore, Akintelu et al. (2023) in Nigeria demonstrated the importance of efficient communication and media planning to support the timely completion of projects. In Zambia, Nsefu (2019) confirmed that effective communication has a significant impact on the quality and timeliness of project implementation. Ajayi et al. (2012) in Nigeria emphasized the importance of communication factors in controlling project time, cost, and quality, including issues on the scope of work and inflation.

Based on the elaboration of the research above, improvements in communication management can have an impact on project performance, Many project communication solutions and models have been previously researched globally, but previous research has only focused on one solution. So the idea of combining risk-based communication management is an alternative that has never been done before.

This research presents a novel contribution by evaluating risk-based communication management in design and build building projects—an area that has received limited attention in existing studies, particularly within the context of Indonesian construction practices. Unlike previous research that has focused primarily on technical or contractual issues, this study introduces an alternative approach that emphasizes stakeholder communication as a strategic element for mitigating time-related project risks. Based on the identified research problems and questions, the main objective of this study is to identify the stages and activities of a design and build project at PT XYZ, map out the internal and external stakeholders involved, and examine the communication patterns between them. Additionally, the research aims to identify high-impact communication risk factors affecting time performance and to formulate risk-based communication strategies that can enhance coordination and project outcomes.

The benefits of this research are multi-dimensional. For students, it offers valuable insights and practical learning in the field of project management, particularly in applying communication and risk evaluation strategies within construction settings. For related government or private agencies, the findings provide actionable input for developing effective communication management strategies in design and build projects, helping to address delays and improve project efficiency. Lastly, for academic institutions, this research serves as a useful scholarly reference that supports curriculum development and future studies in construction management, especially in the domains of risk management and stakeholder communication.

RESEARCH METHODOLOGY

This study adopts a descriptive qualitative research method with a case study approach, aiming to explore the risk-based communication management in the design and build building project at PT XYZ. The descriptive method is chosen to provide a detailed and systematic description of the project's communication patterns, stakeholder involvement, and the impact of communication risks on time performance. This approach enables the researcher to capture the real conditions and complexities of communication practices within the actual project setting. The

research is focused on a single project handled by PT XYZ, allowing for an in-depth analysis of specific phenomena related to project communication management.

The population of this study consists of all stakeholders involved in the design and build project at PT XYZ, including project managers, site engineers, design consultants, procurement teams, and subcontractors. From this population, a purposive sampling technique is used to select a sample of 15–20 key informants who are directly involved in the communication process of the project. The data collection instruments include structured interview guides, observation sheets, and document analysis. To ensure validity, triangulation is applied by comparing information from interviews, direct observations, and project documents. For reliability, the research follows a consistent interview protocol and uses predefined categories for coding qualitative data, supported by inter-coder reliability checking.

The data collection is conducted through semi-structured interviews, on-site observations, and analysis of project documentation such as progress reports, communication logs, and risk registers. The procedure includes initial coordination with PT XYZ, stakeholder identification, instrument validation, data collection, and coding of qualitative data. The analysis is performed using NVivo software, which facilitates coding, theme identification, and cross-referencing among data sources. The data analysis technique follows thematic analysis to identify communication risks, patterns, and their implications on project performance. The final stage involves synthesizing findings into a framework of risk-based communication management that can inform future design and build projects.

RESULTS AND DISCUSSION

Data Collection

Phase I Data Collection – Phase I Expert Validation

After archival analysis was carried out in making questionnaires based on literature studies and previous research, then stage U data collection was carried out in the form of expert validation phase I. Expert validation phase I was carried out by distributing questionnaires for verification, clarification, and validation by experts who are experts in their fields. The purpose of the first phase of expert validation is to find out the stages and activities of the design *and build* building project at PT XYZ. The validation test is carried out to ensure that the data obtained is more valid and has good references and comes from experts for expert criteria, namely by having a minimum of ten years of experience in building construction, having a minimum S1 degree, having handled design projects, and having a position at the level of Vice President or project manager coordinator at PT. XYZ. The number of experts or practitioners required is three.

The questionnaire for the validation of phase I experts can be seen in Appendix I. The results of phase I data collection are made in the form of recapitulation so that the data is easy to process. Expert profiles on level I data collection can be seen in Table 1 below.

Table 1. Phase I data collection expert profiles – phase I expert validation

Yes	Expert	Position	Education	Experience (Years)
1	Expert 1	Senior Vice President of Property Division of PT XYZ	S2	26
2	Expert 2	Vice President of Production Building Division of PT XYZ	S1	17

Yes	Expert	Position	Education	Experience (Years)
3	Expert 3	Project Manager Coordinator Type A PT XYZ	S1	33

Source : Processed Author, 2023

Data Analysis

Phase I Data Analysis – Phase I Expert Validation

The first phase of data analysis is a validation of the variables of stages and activities in the stages and activities of the design *and build building* project at PT XYZ to experts.

The stages of the design building project at PT XYZ are divided into four main phases, namely the Adjustment Phase, the Design Phase, the Construction Phase, and the Closing Phase. In the Adjustment Phase, the activity begins with preliminary stages which include field review, handover of work sites by PPK to suppliers, handover of personnel by suppliers to contract signing officials, issuance of SPMK, and implementation of contract implementation preparation meetings also known as kick-off meetings. In expert validation, the issuance of implementation guarantees by commercial banks was also added. Furthermore, in this phase, there are also activities to provide advance payments and joint inspections, including the determination of an inspection team, the implementation of location inspections, and the preparation of inspection minutes. This examination stage is also expanded with a meeting of the scope of the design.

The Design Phase consists of the development of the Construction Work Quality Plan (RMPK), its updating and approval, as well as the design detail development process (DED) by the design builder team which is then reviewed and approved by the owner. After the design is developed, a process of contract changes is carried out if necessary, starting from submitting an RFI, inspection, granting a change order, to the implementation of contract addendum and periodic design coordination meetings. Expert validation agrees that all activities in this phase are relevant and need to be maintained.

The Construction Phase includes the submission and review of construction documents, the implementation of routine manufacturing and construction inspections, as well as the witness and hold points process to ensure technical quality. This stage also includes contract control activities such as joint supervision, the implementation of a show cause meeting (SCM) in case of deviation, and instructions for the acceleration of work. All of these activities are consistently validated by experts.

The last phase is the Closing Phase which involves payment of work achievements, starting from submission by the provider, progress check by the Constitutional Court consultant, verification by the owner, and payment submission by the PPK. This phase also includes completion testing stages such as application notification, test execution, reporting, and management of quality defect lists. The handover of work is carried out in two stages, namely the first handover and the second handover (final hand over), each through the submission process, assignment of the audit committee, assessment of results, and approval by the PPK. All of these activities have been reviewed and approved by experts, including the addition of the final stage in the form of a second handover as the final closing of the entire project.

If you need a more concise version, in an academic or report style, or would like this paragraph to be divided by phases, I'm here to help.

CONCLUSION

This study concludes that the design and build building project at PT XYZ follows a structured four-phase process—Adjustment, Design, Construction, and Closing—that is both systematic and aligned with industry best practices. Through Phase I expert validation, involving highly experienced professionals within the organization, all stages and activities in each project phase were confirmed to be relevant and critical for project success. The Adjustment Phase was enhanced with activities such as the issuance of implementation guarantees and expanded inspection scopes. The Design Phase emphasized iterative quality planning and contract change procedures, while the Construction Phase focused on document control, technical inspections, and real-time contract management. The Closing Phase consolidated payment mechanisms, completion testing, and handover protocols, including a newly validated second handover process. These findings validate that clear communication, stakeholder coordination, and structured activity mapping are essential for improving time performance and reducing risk in design and build projects. For future research, it is recommended to incorporate a quantitative risk assessment model or stakeholder network analysis to measure the impact of communication management on project outcomes across different types of infrastructure projects.

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