

# The Framework of Information Distribution in Project Communication System of Quality Culture in Construction Companies to Reduce Construction Failure Levels

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## Abstract

Development in Indonesia is increasing every year which affects to Construction Companies. There were more than 17 incidents of construction failure in national companies since the 2016 - 2020. One of the causes of construction failure was the information distribution. The aim is to get the variables that impact the for improving the information distribution strategy in project communication system to reduce the construction failure rate. This study conducted data analysis from 8 experts who work in the construction companies using quantitative methods and questionnaire. the results, there are 11 variables and 44 indicators that impact for improving strategies the information distribution in project communication system at quality culture to reduce the construction failure rate.

**Keyword :** Construction Service Company, Information Distribution, Quality Culture, Construction Failure.

## 1. Introduction

Development in Indonesia is increasing from year by year in terms of settlements, offices, industry and transportation facilities that support and increase the distribution of goods and services. The government also supports and accelerates development in Indonesia to improve the country's economy by determining many National Strategic Projects (PSN). A total of 248 National Strategic Projects (PSN) spread throughout Indonesia, in which the development is accelerated by the government, which is stated in the Presidential Regulation of the Republic of Indonesia Number 58 of 2017. However, the construction service industry often experiences many obstacles in the process of planning, implementation and completion of construction. This is because in its implementation dealing with parties both from internal and external as well as the lack of application of ISO 9001 which has an impact on the success of a project. The success of a project carried out by a construction service company is influenced by good or bad quality in the planning process, implementation to completion of construction. The majority of construction failures that occurred during this period were carried out by large contractors, one of which was a contractor from a national construction service company. This is due to the lack of implementing a quality culture in the development process until completion and not having an ISO 9001 certificate.

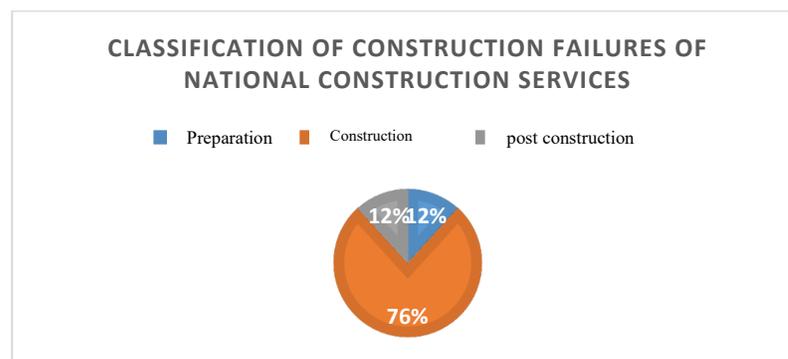


Figure 1.1. Construction failure classification chart

Based on figure 1.1. There can be failures that occur in national construction companies as much as 76% occur at the implementation stage which is caused by a lack of communication in the system, method and scope of work, which is included in the critical and important category of communication systems, with effective work methods and procedures, can produce good planning document information (Thomas 1998). Based on other research, the causes of construction failure are caused by three things, namely inadequate knowledge of quality, construction methodology and supervisory supervision (Love, Ackermann, Carey, and Marrison 2016). When viewed from a project and company perspective, one of the main factors that are fundamental to the success of a project and a company is the communication system. Without it, stakeholders and the project team can be left wondering where things stand and what the decisions have been made. Communication includes effective exchange and understanding of information between parties. Effective communication is very important for project success, information must be distributed to the right and relevant parties, accurately and consistently to meet the objectives (Ćulo and Skendrović 2012). Based on the theory of complexity in communication management in the context of crisis response, the interactive patterns between individuals and organizations that underline the shift in social aggregation can be better understood. Failure in construction quality is only partly caused by technical factors (Ashford 1989). Management and organizational factors, such as poor communication flow, are more often mentioned as the root of the problem (Cornick 1991). Communication skills and leadership styles influence project success in the construction industry in South Africa (Gewanlal and Bekker, 2015). Indicators of project success and failure are project understanding, effective project team, good project communication, achievable project schedules, realistic cost estimates and effective project control and are responsible for achieving project success (Poon, Potts, and Cooper 2001).

Based on the literature description, the information distribution in the project communication system needs to be studied more deeply and becomes the focus of this research and will be the variables to be assessed and evaluated. There is a strategy to increase the information distribution in the project communication system to determine the factors that influence the quality culture that causes construction failure, by knowing these factors, the strategies for improvement can be found in the communication system so as to improve the quality culture of the national private construction service company and able to reduce the construction failures in Indonesia.

### **1.1 Objectives**

Determining indicators in the construction project communication system that affect the success of national private construction service companies in reducing construction failure rates for generate strategies to improve the information distribution in construction project communication systems that need to be applied to national private construction service companies.

## **2. Literature Review**

### **2.1 Quality culture**

According to the Regulation of the Minister of PUPR No.2 of 2017 regarding quality management requirements, it is regulated that one of the requirements for Construction Operators to participate in tenders is "Having a Quality Management Certificate, Environmental Management Certificate, and Occupational Safety and Health Certificate; (only required for Construction Work that is Complex / High Risk in nature and / or designated for Large Business Qualifications)". In line with the Minister of Public Works and Housing Regulation No.2 of 2017 according to LPJK Regulation No. 12 / LPJK 2009 in connection with the re-registration of construction company certificates in 2010. that every Class 7 construction company (the highest qualification class of construction companies in Indonesia) must have a valid ISO 9001 certification in order to be eligible to undertake a construction project (Willar, Coffey, and Trigunarsyah 2015). So it can be concluded that there is already a quality management system in Indonesia. However, with the construction failure phenomenon, the problem of Quality Culture in Indonesia is not the absence of a quality management system, but the implementation of the system. Hardjosoedarmo (1999) defines a quality culture (quality culture) as a pattern of values, beliefs, and expectations that are embedded and developed among organizational members regarding their work to produce quality products and services.

In construction companies, quality culture is an activity that must be developed to support the quality process or maintain the company's existing quality system. (Pamulu and Husni 2005). Gryna (2007) defined a quality culture as a pattern of habits, beliefs and behavior regarding quality (Mahmood and Mohammed, 2008). There are a variety of cultural influences on individuals and stakeholders who shape their expectations, which include national culture,

vocational culture (industry, institutional and professional culture) and organizational culture (Mahmood and Mohammed, 2008).

## 2.2 Failure in construction

Construction failure can be interpreted as a failure that occurs during construction, which can be a collapse, or distress, of a structural system in such a way that it cannot safely meet the expected objectives (Janet and Lockley 2002) Based on previous research, it indicates that structural construction failure occurs due to several variations of human error, which is caused by not updating knowledge and not avoiding construction accidents, delays in communication from acquired knowledge, indifference to new knowledge, misunderstanding in applying knowledge, falsification of application and not. correct procedure. (Levy and Salvadori 1992), quoted from (Janet and Lockley 2002). A study conducted showed that a 32% project success rate was completed on time and on budget, as well as meeting basic requirements, for the projects surveyed, 44% faced project challenges such as late delivery, over-budgeting and meeting some basic project requirements, as well as 24% failed because they did not finish (Amoah, Shakantu, and Schalkwyk 2020). Failure in construction quality is only partly caused by technical factors (Ashford, 1989). Management and organizational factors, such as poor communication flows, are more often cited as the root of the problem (Cornick, 1991). While the causes of its occurrence are divided into five main areas, namely (Yates and Locker 2002): (1) Design flaws; (2) Lack of construction; (3) Lack of materials; (4) Lack of administration; and (5) Maintenance deficiency.

Josephson and Hammarlund (1999) state that the direct causes of construction errors are mainly due to individuals who are affected by conditions. Based on the studies conducted, it was identified that about 50% of the stated cost of errors was derived from what they called motivation defects. Motivation defects are categorized as defects caused by "people's desire to contribute, through their own actions, to the resultant organizational action". Of the 50% defects caused by this motivation, the results of their research stated that most of them were due to forgetfulness or carelessness, only a few were due to intention, and about 29% were due to lack of knowledge, while a small proportion was due to lack of communication, due to pressure, and also risk factors (Josephson and Hammarlung 1999). Although workmanship and unfinished work are also the cause of defects, the lack of skills of workers is not the main problem, the main problem is the lack of concern of these workers (Forcana , MacArulla, Gangoellis, and Casals 2014).

## 2.3 Information Distribution Of Quality Culture

The success of the project implementation will be determined by how well the project is achieved. Two important factors to determine the success of a project are field management and the relationship between contractor and owner (Oberlender 1993 in Frista 2006). Based on PMBOK 6th edition 2017 in project communication management, it discusses the information distribution contained in input, tools and techniques and output. Where the distribution of information itself based on PMBOK 4th edition 2008 has its own details which are now combined in manage communication in PMBOK 6th edition 2017. The information distribution stage is carried out after communication planning is carried out, communication planning is the stage of determining the information and communication needed by stakeholders, who needs what information, when they will need it, and how information will be given or conveyed to them (Project Management Institute 2008).

At this stage, the information distribution includes making the information needed and available to project stakeholders on time (Project Management Institute 2008). The project plan is an approved official document that is used to manage and control the project, the document is expected to provide contractual provisions that help reduce delays, confusion, and orders or duplicate work (Guide on construction site communication). Lack of good communication skills significantly affects the quality and work coordination. (Wang 2000). Communication in the project can be done by meeting which is a forum / media for communication and coordination between members of the project management team consisting of project owners, supervisory consultants, and contractors or other parties in order to complete project implementation. The project manager himself holds meetings for several purposes, each of which is needed to solve problems with different objectives and carried out in different ways. According to their frequency, meeting events in communication can be classified as follows: daily meetings, weekly or monthly meetings, occasional meetings or special project meetings.

The information distribution stage includes making the information needed and available to project stakeholders in a timely manner (Hofstede 2011). The project plan is an approved official document that is used to manage and control the project, the document is expected to provide contractual provisions that help reduce delays, confusion, and

duplicate orders or work. Lack of good communication skills significantly affects the quality and work coordination. (Wang 2000).

The information distribution process, namely the required input for communication management planning, is processed by using techniques and methods: (1) Communication skills; (2) Collect and retrieve information systems; (3) Information distribution methods; and (4) Learning process.

### 3. Methods

The process is a series of systematic steps in order to solve a problem or get an answer from a particular study. (Sumadi 2013). Based on the literature, there are phases of research stages to answer the formulation of the problem (Prasetyo and Miftahul, 2007), namely research design, preparation of research framework and theory, and collection, processing, and presentation. The research design is the initial phase to design research, namely by identifying the problem, problem formulation, research objectives and significance. The preparation of a research framework and theory is a phase in which the researcher conducts a literature review, construction of theoretical models, analysis models, hypotheses and operational concepts. While the collection, processing, and presentation stages are the phases where the research formulation that has been prepared previously can be answered by determining the research instrument needed so that the research variables can be measured and achieve the objectives of the research and hypothesis testing. The following Figure 2 is a flow chart of the stages in the research.



Figure 2. Research stages

### 4. Data Collection

The research instrument used to answer Research question is a questionnaire. Data collection is done by validating the variables that have been obtained from the literature study. Variable validation is carried out by several experts in the construction field for at least 10 years from practitioners, both government and academics.

### 5. Results and Discussion

There are 11 variables obtained from previous literature studies and PMBOK from the distribution of information in the project communication system. This variable can be used as a reference for strategies to improve the distribution of information in the project communication system on a quality culture to reduce the rate of construction failure. Based on literature study and also validation from experts, 11 variables can be identified that can be used to describe the implementation of culture in construction companies. The fifth variable and subvariables.

#### 5.1 Numerical Results

By conducting a literature study from previous research and PMBOK on the distribution of information, the authors obtain the variables and sub-variables of the distribution of information in project communication. The author validated the variables and sub-variables (Table 1) with 8 experts and obtained the results that found fifth identified variables are:

1. Information Distribution Planning
2. Information Reporting
3. Organizational Asset Management Planning
4. Information Credibility
5. Information Distribution Method
6. Information Technology
7. Effective Leadership In Communication
8. Understanding Of Information Between Parties
9. Interpersonal Communication Skills
10. Project Information System
11. Final Document Of Work Results Containing The Entire Work Execution Process

Table 1. Variable and sub – variable information distribution

No.	Variable
X.1	Information Distribution Planning
X1.1	The company is able to collect important information in optimal information management to identify project performance and assist in organizational decision-making processes.
X.1.2	The company prepares a plan schedule at the stages of collecting, distributing, storing, retrieving and final disposition of project information for short-term and long-term goals.
X.1.3	The company has an analysis of the requirements of the project's information needs from the type, delivery format and limitations of the distribution of information to all parties who submit or receive information.
X.1.4	The company is able to plan and determine the methods that will be used to carry out the communication needed by the project team members.
X.1.5	The company has the right information distribution technology plan to produce project information in a timely manner.
X.1.6	The company has the right information distribution technology plan to produce project information in a timely manner.
X.1.7	The company has a priority scale for those who receive or convey information.
X.2	Information Reporting
X.2.1	Reporting Company information has a good accuracy and suitability of information from the amount of information and information collection.
X.3	Organizational Asset Management Planning
X.3.1	The company is able to make the process of transforming the distribution of information before it reaches the intended recipient of the information.
X.3.2	The company is able to make organizational management so that each department or section in the organization is responsible for disseminating complete information and controlling the communication process.
X.3.3	The company is able to standardize or establish communication standards/ specifications and plan documents for information delivery needs so as to create regularity in the delivery of information to all parties.
X.4	Information Credibility
X.4.1	The organization is able to respond and convey information well.
X.4.2	The organization employs recognized and trusted human resources to deliver a consistent message.
X.4.3	Organizations are able to interpret information effectively and disseminate information to interested parties.
X.4.4	Organizations are able to integrate information to project success.
X.4.5	The organization is able to ensure that the recipient of the information has received the information correctly and is acknowledged.
X.5	Information Distribution Method
X.5.1	The company was able to optimize available distribution methods such as face-to-face meetings, telephone calls, exchange of images and documents by involving various professionals and organizational fields.
X.5.2	Companies are able to use field documentation to send picture messages and to record updated information or if any changes or expansions are made in the field.
X.5.3	The company is able to optimize the method of information, namely written communication that is short, accurate and free from ambiguity to improve communication during project management.
X.5.4	The company is able to optimize electronic communication for the delivery of information.
X.5.5	The company is able to optimize oral communication involving face-to-face and telephone communication.
X.5.6	The company is able to optimize interactive communication for the multidirectional exchange of information to ensure mutual understanding by all parties.
X.5.7	The company is able to optimize the push communication method to ensure that the information is distributed or understood by the intended party.

No.	Variable
X.5.8	The company is able to optimize the pull communication method for delivering information.
X.6	Information Technology
X.6.1	The company uses updated/relevant information distribution technology to achieve its information distribution objectives.
X.6.2	The company is able to determine the type of sophisticated and relevant information distribution technology for design information and to support multi-team construction design alignment.
X.7	Effective Leadership in Communication
X.7.1	Leaders have good communication skills and strong leadership to deliver projects on time and within budget and effectively manage communication between team and organization.
X.7.2	Leaders are able to perform vertical communication based on hierarchical relationships;
X.7.3	Leaders are able to carry out diagonal communication between internal and external parties.
X.7.4	Leaders are able to communicate horizontally.
X.7.5	In addition to technical and cognitive abilities, leaders possess communication skills, interpersonal skills and emotional skills.
X.7.6	Leaders have the ability to adopt appropriate communication methods to convey information between the team and the organization.
X.7.7	Leaders have the ability to communicate vision and convey change plans and appropriate strategies to achieve project goals.
X.8	Understanding Of Information Between Parties
X.8.1	The parties involved in the organization have the ability to exchange information effectively and understand information between teams.
X.8.2	The parties involved in the organization have the understanding and ability to convey information accurately and consistently to other parties who need to receive messages.
X.8.3	The parties involved in the organization are able to monitor, review and evaluate the ongoing communication process for learning communication as an ongoing process to get ideas/improvements in the future.
X.9	Interpersonal Communication Skills
X.9.1	Personnel involved in the organization are able to make adjustments to vocal and speech patterns to accommodate the needs of the recipient of the message.
X.9.2	personnel involved in the organization are able to diagnose and fix unexpected problems between parties.
X.10	Project Information System
X.10.1	The company is able to optimize the dissemination of project information among stakeholders using relevant information systems such as information systems for meetings, virtual offices, web portals, etc.
X.10.2	The company is able to optimize the ease of communication accessibility between parties or other groups in the process of distributing information.
X.11	Final Document of Work Results Containing the Entire Work Execution Process
X.11.1	The company has a final document of the work that contains the entire process from start to finish in the form of a drawing document.
X.11.2	The company has a final document that contains the results of the work that contains the entire process from start to finish in the form of contract documents or documents during construction, document exchange contracts that include changes/variations, architect's instructions, appraisals and measurements, etc.
X.11.3	The company has a final document of the work that contains the entire process from start to finish in the form of a construction activity schedule, material delivery schedule, detailed program, etc.
X.11.4	The company has a final document that contains the entire process from start to finish in the form of memos, minutes of field meetings, faxes, telephone calls, call records, etc.

## 5.2 Proposed Improvements

From analysis and collection data, the results show that the existing 11 variables and 44 sub-variables in the project communication system in a quality culture that affect construction failures and can be used to make strategies to

improve the distribution of information in project communication systems at construction service companies in Indonesia to reduce construction failure rates. However, it is necessary to pay attention to the things that most influence the 11 variables of each construction service company which will be reviewed to ensure the accuracy of making strategies to improve the distribution of information in its quality culture so as to reduce the rate of construction failure.

### 5.3 Validation

The distribution of information in information systems needs to be studied to reduce the rate of construction failure, where the results of the study obtained 11 variables that influence and in each of them there are sub-variables that can help assist research so as to reduce the failure rate, in place and research respectively. Only a small part of construction quality failures are caused by technical factors (Ashford 1989). Management and organization of organizations, such as poor distribution of communication, are more often cited as root causes (Cornick 1991).

### 6. Conclusion

It can be concluded that the quality management system already exists in Indonesia. Where the problem lies in discipline in its application, especially in construction service companies. Information distribution in the project communication system in the quality culture is one of the important points in the quality culture that needs to be reviewed and improved to improve. Therefore, in an effort to create a strategy to increase the distribution of information in project communication in a quality culture to reduce the failure rate of construction, it is necessary to have information distribution variables that describe the application of the quality culture. Based on the literature study and expert validation in this study, it appears that there are fifteen information distribution variables that can be used to measure the application of quality culture in construction companies.

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