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The Needs for Standardization of Document Towards an Efficient Communication in the Construction Industry

Vasanthi R. Perumal and Abu Hassan Abu Bakar

School of Housing, Building and Planning Universiti Sains Malaysia, Pulau Pinang, Malaysia

Abstract: The objective of this paper is to establish a standardization concept that enhances the communication process and facilitates better document management as a management tool. The study is conducted by a literature review on communication planning, flow and structure. A questionnaire survey was distributed to the stakeholders in the construction industry. The respondents in this study are stakeholders from the city of Ipoh, which is located in the state of Perak, Malaysia. A total of 45 respondents were involved in the current research. The result indicates that standardization and standard communication instruments play an important role in effective communication. Improvements in these standard documentation and communication instruments are required. An implication of the current study is that the improvement of project communication processes and technologies at different functional levels may change the organization of future projects and how their business activities and work routines are designed, planned and performed.

Key words: Planning · Concept · Flow · Structure · Instrument

INTRODUCTION

Nowadays, people have better understanding of the need to practice good communication in the society to deliver meaningful communication. Construction is a fragmented and dynamic sector with a project-based nature. Thus, many stakeholders operate in frequently changing relationships, which are contractually driven [1]. There are different communication instruments, such as contracts, specifications, reports, manuals, schedules, calculations, drawings, computer files, disks, print-outs, photographs, agenda and minutes of meetings [2]. The management of documentation and communication in a project, as well as the storage and retrieval thereof for further use, is conducted by a number of subcontractors. These documents describe different ranges of usages at different project life cycles. Without a proper and standard document and communication structure, the development of a project could be delayed. The purpose of this research paper is to improve communication in the structure, flow and planning in the construction industry for better documentation management. The importance of a process-oriented approach to the success of any business is well documented [3, 4, 5]. The management process in every organization, especially in documentation, is very important because it is used as a tool for analyzing and enhancing business processes.

Research Objective: The objective of this research is to identify the requirements of a better organization standardization, which leads to a good communication process to remain competitive and to provide a more effective communication tool and standardization. This standardization is very important to foster an improved understanding of what the organization needs while considering time, cost and quality in the construction industry. Good document standardization is required to increase communication efficiency among the stakeholders and different parties in the industry. Documentation control enables effective information sharing among team workspaces, leading to cooperation among the members involved in the project. In sum, the current paper discusses the importance of standardization for excellent communication in the organization and in the construction industry.

Definition of Standardization: Standardization is an important benefit of process documentation. Well-defined process documents can be used to develop standard operating procedures [6, 7]. Document standardization helps achieve consistency in operations. Proper document standardization improves management procedure while reducing conflict among current employees and providing an overall idea on how a management system should be conducted.

Corresponding Author: Vasanthi R. Perumal, 7, Jalan Pengakalan 8, Taman Pengkalan Jaya, Pasir Puteh, 31650, Ipoh. Perak, Malaysia. Tel: + 60164345906, E-mail: ashblack84@yahoo.com.

The main purpose of standardization is to develop a specific level of conformity [8].

Standardized project documentation and records help establish the baseline and the communication process in a project team. Professionally standardized documents identify the requirements to support and enhance the daily management functions, especially in delivering good communication. Through document standardization, internal communication between the various levels and functions can become effective. Standardization contributes to increased productivity because the documents and communication from one project to the next are organized similarly, creating less confusion. Thus, a better communication plan, communication flow and instrument and communication structure are crucial in obtaining good standardization [5].

Definition of Communication: Communication is the process in which information is encoded and imparted by a sender to a receiver via a channel/medium. The receiver then decodes the message and gives the sender feedback. Communication requires all parties to have an area of communication commonality. These communication commonalities include auditory means such as speaking, singing and sometimes tone voice, as well as nonverbal and physical means such as body language, sign language, paralanguage, touch, eye contact and even written communication. Communication is a process by which we assign and convey meaning in an attempt to create shared understanding. This process requires a vast repertoire of skills in intrapersonal and interpersonal processing, listening, observing, speaking, questioning, analyzing and evaluating. Collaboration and cooperation occur through communication. There are three types of communication in business: written, verbal and non-verbal. Written communication includes letters, emails, memos, reports and formal documents. Verbal communication includes chat, presentation and voicemails. Non-verbal communication uses signals to communicate and study body language [9].

Communication and Standardization: Communication is pervasive in all areas of organizational life. Communication is a process of transferring information from one source to another. It is commonly defined as "the imparting or interchange of thoughts, opinion, or information by speech, writing, or signs." Communication is a two-way process in which there is an exchange and progression of thoughts, feelings, or ideas towards a mutually accepted goal or direction [9]. The construction industry depends on external communication to deal with complex inter-organizational relationships. Project communication management tools and techniques ensure the timely and appropriate generation, collection, dissemination, storage and ultimate disposition of project information [10]. Thus, communication planning, flow, structure and document standardization in an organization are crucial in enhancing business projects.

Proper and good communication skills in terms of verbal, written and contractual are essential at all stages of a project from inception until completion. Document standardization can enhance communication skills in any organization. A proper standardization system, procedure and policy in the organization can boost communication in all aspects, such as planning, controlling, monitoring and organizing. Information flow through proper communication channels and standardized documentation are key enablers in running any project successfully [11].

Types of Communication: Verbal communication involves using speech to exchange information with others, communicating verbally in a face-to-face conversation. Meetings, interviews, conferences, speeches and phone calls are other forms of verbal communication. We communicate verbally to exchange ideas, understand diverse points of view and solve problems. Verbal skills are among those most valued by employers to improve professional work performance [12]. In verbal communication, one person sends a message to another person or group using speech. Communication is successful only when the speaker and listener understand each other. As the average person is exposed to thousands of messages every day, messages must rise above competing information to gain the listener's attention. After receiving the messages, listeners must be able to interpret or decode their meaning.

Written communication is communication by means of written symbols either printed or hand written. It also includes questions related to communicating with others through the written word like emails, notes, memos and proposals. For business purposes, managers must deliver their messages clearly, sufficiently and effectively if they want to be successful. Poorly written messages create confusion and fail to achieve the intended purpose.

Communicating through writing is essential in the modern world and is becoming ever more so as we live in the information age. Written messages do not have to be delivered immediately; instead, they can be edited and revised several times before they are sent so that the content can be formed to obtain the maximum effect.

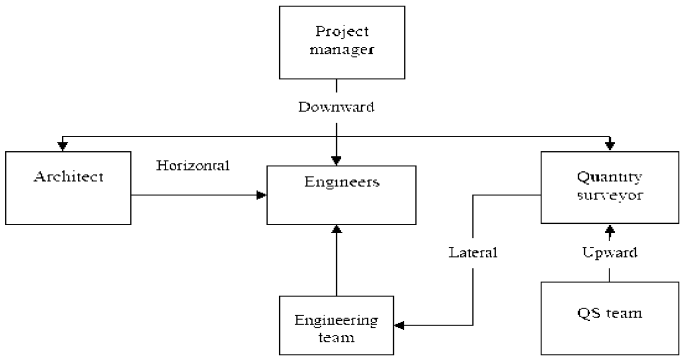

Fig. 1: Communication Flows: Source (Adapted from [8], Smit and Cronje, 2002)

Written communication is often considered more appropriate in complex business messages to increase customer/client satisfaction, improve inter-organizational efficiency and enhance image in the community and industry [13].

Contract communication process is a process of communicating contractually through several official documentations within a designated authority. Such instruction should be done in writing but may be provided orally in meetings, briefings and phone or video conferencing. A written record of the instruction should be created for such oral instructions. All formal written correspondence to the contractor should include the contract number in the subject line. Formal communication from the contractor should follow a formal contract correspondence tracking system, with the commitments appropriately assigned and tracked for timely completion. The contractor is required to communicate with other team members and staff in conjunction with the responsibilities and work scope [14].

Communication Flow and Instruments: Communication flows in four directions: downwards, upwards, horizontally and laterally. These basic communication flows are shown in Figure 1.

Communication that flows from the superior to the subordinates is known as downward communication. In an organization structure, superiors utilize their abilities to attain the desired targets. That is, they can issue commands, instructions and policy directives to the persons working under them (at the lower levels). In downward communication, superiors anticipate the instant performance of a job and is thus highly directive. Downward communication includes statements of organizational philosophy, policies, project objectives, schedules, budgets and constraints, position descriptions and other written information related to the importance, rationale and interrelationships and interactions of various department projects and jobs in an organization [8].

According to Smit and Cronje (2002) [8], upward communication is beneficial for companies because it can increase the participation of employees and reveal their issues and problems. In this type of communication, information is provided to the upper management to evaluate the overall performance of the projects for which they are responsible or to refine the organizational strategy. Horizontal communication occurs at the same level and facilitates the linking of different areas of expertise, encouraging innovation. In an organization, lateral communication works in contrast to the traditional top-down, bottom-up communication methods. Individuals participating in this non-traditional form often become aware of new events before those higher up on the communication ladder. Information that spreads through lateral communication usually moves at a faster pace than that of tradition methods and enables individuals with a diverse action.

Informal Communication: According to Gruing, informal communication takes place because of the individual needs of the members of an organization; it subsists in every organization [15]. Generally, such communication is oral and can be expressed even by a simple glance, sign, or silence. Informal communication is implicit, spontaneous, multidimensional and diverse. It usually works within a group of people. That is, when one person has some information of interest, he/she passes it on to his/her informal group and so on. Despite its many advantages, informal communication has certain disadvantages. Informal communication contains a combination of facts, deceptions, rumors and unclear data. The informal channels of communication may transmit completely imprecise information that may harm

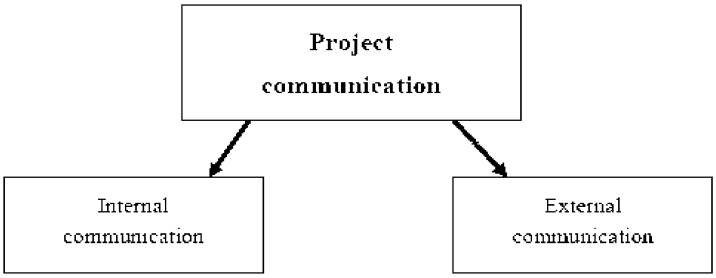

Fig. 2: Project Communication: Source: (Adopted from [16], Le Roux, 1999)

rather than help an organization. Moreover, determining who is responsible for its origin or flow of information is impossible. However, for the efficient operation of any organization, both formal and informal communication types are required.

Project Communication Instrument: Project communication, as shown in Figure 2, is the internal and external communication between members of an organization at all levels for the achievement of a mutual goal or goals.

To achieve these goals, communicating or interacting at various levels of the organization is necessary: this is known as internal communication. Members also have to communicate with individuals or groups who are not members of the project: this is referred to as external communication. The project communication instrument defines how and what the project will communicate to its stakeholders. This communication occurs within the team and between the team and external entities. The project communication instrument identifies the processes, methods and tools required to ensure timely and appropriate collection, distribution and management of project information for all project stakeholders. It also describes the team's strategy for communicating internally among team members and company personnel, as well as externally with vendors and contractors. In the construction industry, some communication instruments are used among the stakeholders. These types of communication include estimation, cost plan, payment advice, cost report, escalation costing presentation, final accounts, standard document, contract document and drawings. These instruments are given priority by the professionals from inception until the completion of a project. Standardization of documents through a rigid system used by the construction company enables professionals to work properly and deliver messages at the right time [16].

Communication Structure: Structure defines the lines of authority and communication and specifies the mechanism by which tasks and programs are accomplished. The performance depends on the coordination between the parties involved, the system of communication, the culture of the project, the staff members and the communication structure [17].

In many ways, intercultural communication is far more complicated because participants need to be aware of an increased possibility of misunderstanding. Project team members are part of different sub-cultures. In a project team, there may be communication problems because of these differences and expressions in different professions [18].

People, systems, cultures and structures may be used as communication strategies to ensure the performance of the project. Every sub-project has a set of people, systems and culture different to those of the main project. These differences strain the project, increase communication problems and make it less likely to complete a project without incidents. People in the organization use the proper system implemented by the organization to communicate effectively, whether internally or externally. This proper system also helps in improving communication within the organization. It plays a vital role among the stakeholders because it results in good understanding within the organization and among the different parties. Organization structure influences the coordination and flow of the organization system. A proper organization structure should be formed to encourage good flow of information and enhance effective communication in the organization and in the industry. A good organization structure leads to the practice of better time, quality and cost management as well as to the increase in organization performance [17].

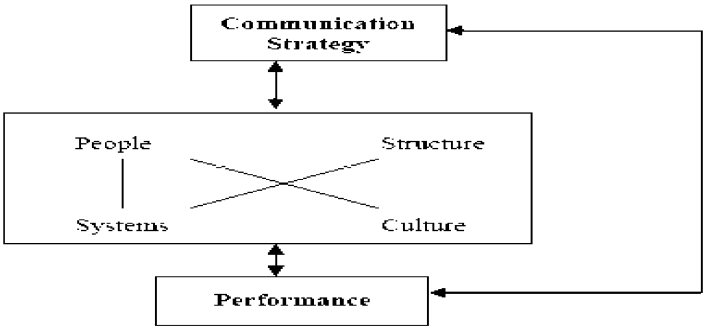

Fig. 3: The framework for analyzing projects: Source: (Adapted from [17], Aaker, 1992)

MATERIALS AND METHODS

Research was conducted on the stakeholders of the construction industry in Ipoh city in the state of Perak, Malaysia. The practice of document standardization for good communication in an organization was determined and interpreted. The efficiency of professional communication and communication instrument was established when the concept of document standardization was considered. The survey was conducted to evaluate the current performance of the stakeholders in terms of their communication and communication instruments in the construction industry. Professionals (i.e., architects, engineers, project managers and quantity surveyors) were requested to respond to the questionnaire. Around 100 questionnaires were sent out to these stakeholders, which account for 20% of the overall population. In the current study, a random sample approach was used and the result was convenient. A structured questionnaire was administered to the stakeholders face to face through a walk-in interview and postal service. Out of the 100 questionnaires, 45 were returned and useable. Before the survey administration, an interview and a pre-test of the questionnaire with a small group of respondents were conducted to validate the survey instrument.

RESULTS AND DISCUSSION

Quantitative data from the survey responses were coded and entered into an SPSS database. Mean comparison (mean) analysis was conducted on the respondents' communication skills and instrument usage. Some important findings can be concluded based on this survey. Communication is most strategic, now more than ever. In this information-driven age, communication is an integral part of the corporate strategy. Although writing is still the core skill in communication, verbal, written and contractual communication skills were rated almost the same importance. The respondent profiles were considered in this survey, including type of organization (i.e., client, contractor, consultant and others), respondent position (i.e., architect, project manager, engineers and quantity surveyor), respondent and company experience in the construction field and number of construction projects in which the respondents were involved. The following discusses the findings for the two separate types of communication information (i.e., skills and instruments) of the stakeholders.

Communication Skills: Results from the survey indicate (Table 1) that the three communication skills, namely, verbal, written and contractual, have almost the same importance in the construction industry. Usage of the verbal communication skill is higher among the quantity surveyors, with the highest mean of 3.81 and a total of 12 respondents. This finding shows that verbal communication is highly used among quantity surveyors because they communicate more often to all project team members internally and externally throughout the project. The mean is highest for written communication among engineers, which is 3.81 compared with other stakeholders. Project engineers are responsible for providing guidance, managing the project and coordinating the engineering teams, making written communication crucial in their task. Engineers hold the highest mean for contractual communication at 3.72 because they are responsible for obtaining all the necessary permits and licenses and depending on the contractual arrangements, for directing or monitoring compliance with building and safety codes, other regulations and requirements set by the project insurers. They also oversee the delivery and use of materials, tools and equipment; worker safety and productivity; and the quality of construction. Verbal communication is understandably the most vital communication skill. Overall, verbal, written and contractual communication skills were rated almost the same in importance.

Table 1: Respondents' ratings for verbal, written and contractual communication skills

Types of Position		Verbal Communication	Rank	Written Communication	Rank	Contractual Communication	Rank
Architect	Mean	3.630	4	3.630	2	3.00	4
	N	11.000		11.000		11.00	
	SD	.809		.809		1.34	
Project Manager	Mean	3.750	2	3.410	4	3.08	3
	N	12.000		12.000		12.00	
	SD	.965		.792		1.31	
Engineers	Mean	3.720	3	3.810	1	3.72	1
	N	11.000		11.000		11.00	
	SD	.904		.981		1.00	
Quantity Surveyor	Mean	3.810	1	3.540	3	3.36	2
	N	11.000		11.000		11.00	
	SD	.873		.820		1.02	
Total	Mean	3.730		3.600		3.28	
	N	45.000		45.000		45.00	
	SD	.863		.836		1.17	

Table 2: Importance of a communication instrument used by professionals

Types of Position	Architect			Project Manager			Engineer			Quantity Surveyor			Total		
Types of Communication Instruments	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank
Estimation	4.00	.894	2	3.66	.778	4	3.81	.981	3	4.18	.404	1	3.91	.792	1
Cost Plan	3.00	.774	2	2.91	.792	3	3.36	.924	1	3.00	1.000	2	3.06	.863	7
Payment Advice	3.36	1.280	2	3.16	1.114	4	3.72	1.190	1	3.35	1.361	3	3.40	1.210	2
Cost Report	3.00	.632	4	3.33	.778	3	3.54	1.128	1	3.36	1.026	2	3.31	.900	3
Escalation Costing Presentation	3.18	.404	1	3.25	.452	2	3.18	.539	1	3.09	0.404	3	3.17	.441	5
Final Account	3.18	.603	2	3.16	.577	3	3.09	.539	4	3.27	.786	1	3.17	.613	5
Standard System Documents	3.09	.831	1	3.00	.953	2	3.00	.632	2	3.00	.632	2	3.02	.753	8
Contract Condition Document	2.72	.646	4	3.25	.866	2	3.09	.831	3	3.27	.904	1	3.08	.820	6
Preliminaries Documents	3.27	.467	1	2.91	.900	2	3.27	.646	1	3.27	.786	1	3.17	.716	5
Preambles Of Trade Documents	3.09	.831	2	3.08	.514	3	2.90	1.300	4	3.37	1.190	1	3.08	.972	6
Drawing	3.45	.700	1	3,25	1.215	2	3.00	.632	4	3.09	1.128	3	3.20	.943	4

Communication Instruments: Table 2 shows the survey results of the importance of a communication instrument used by the professionals. Among the instruments used were those for estimation, cost plan, payment advice, cost report, escalation costing presentation, final accounts, standard system documents, contract condition document, preliminaries document, preambles of trade document and drawings. In estimation, quantity surveyors have the highest importance compared with the other stakeholders, with a mean of 4.18. The reason is that quantity surveyors control the construction costs by accurately measuring the work required and the application of expert knowledge on costs and prices of work, labor, materials and plant required. They also understand the implications of design decisions at an early stage to ensure that good value is obtained for the money to be used and spent appropriately.

In terms of cost plan, the engineers are rated with the highest mean at 3.36. Engineers have to control the projects with the highest degree of efficiency. Cost plan establishes the base line of the project cost at different stages of development of the project. In payment advice, engineers rank the highest, with a mean of 3.36. Payments should be verified carefully before they are conducted. The mean for cost report is 3.54, the highest among engineers. The escalation costing presentation instrument is rated the highest among the project managers, with a mean of 3.25.

In the final account, quantity surveyors hold the highest mean at 3.27. Quantity surveyors control the final accounts by accurately measuring the work required and the application of expert knowledge on costs and prices of work, labor, materials and plant required. They understand the implications of design decisions at an

early stage to ensure that good value is obtained for the money to be spent appropriately. Standard system documentation is one of the most important tools in communication instruments. Results show that architects are rated with highest mean at 3.09. The computer-aided design or computer-aided drafting (AutoCAD) is a specific standard system tool used by these professionals. Nevertheless, this instrument is also popular among other stakeholders. System documentation should be reasonably self-contained. However, it is usually a component of a wider collection of documentation and for it to refer other documents is reasonable. Results show that all stakeholders need and use this systemized standard documentation, whether verbally, written, or contractually.

In contract condition documents, quantity surveyors have the highest mean of 3.27. These professionals need to arrange final contract documents through a brief discussion with the client. In preliminary documents, architect, engineers and quantity surveyor have the same importance. They are responsible for providing best practice guidance on the content, form and preparation of construction production information throughout the project cycle. In the preamble of trade document, quantity surveyors have the highest ranking, with a mean of 3.27. Quantity surveyors ensure that the quantity of each product and materials required to complete the work are consistent in kind, size, quality and overall appearance. Products incorporated into the project should be handled, stored and organized with care.

In drawings, architects rank the highest, with a mean of 3.45. Architects articulate the architectural vision, conceptualize and experiment with alternative architectural approaches, create building models and components as well as interface specification documents and validate the architecture against requirements and assumptions. Results indicate that effective communication contributes to the success of a project.

Conclusion and Implication: In every project, project-related information should be fully documented with proper standardization to ensure that all the people involved understand what is happening throughout the project. Each project involves a great deal of communication and documentation. With many projects using the same communication instruments repeatedly, the operation of the project will be much easier and more understandable if communication instruments, plans, structures and flows are in a standard process. Standardization provides a system for effective management that is not too complex and may contribute to the effective execution and completion of a project.

The improvement of project communication processes and technologies at different functional levels may change the organization of future projects and how their business activities and work routines are designed, planned and performed. The improvement can enable just-in-time deliveries and the more industrialized and rational business processes that the construction industry strives for. On-demand access, mobility of information, enhanced communication tools and new ways of organizing and performing collaborative work can be important components of this development process. The full recognition and determination to improve collaborative communication and information exchange throughout all project phases will have considerable effects on the industrialization process of construction projects. Recently, these issues have started to become a focal point in the construction industry, which is a welcome change of attitude in a project-based industry that historically seems to have taken for granted appropriate project communication practices.

The findings of this research reveal that good document standardization and the usage of communication instruments help facilitate a better understanding among stakeholders in the industry. A good standardization process ensures timely and appropriate generation, collection, distribution, storage, retrieval and ultimate disposition of project information. The findings also indicate that the stakeholders are more likely to depend on each other through the communication process. This result is supported by the existing literature on communication instruments.

The implication of the current research on general practice is to create awareness on the importance of communication tools and instruments in the field of construction. Many organizations are offering more and more communication awareness courses that address the skills and create interactive environments. The current study suggests that involving stakeholders in the construction industry should adopt the usage of good communication tools and instruments that will ensure each team member will successfully communicate with each other to deliver a good end product. These tools provide fast, accurate and constant feedback. Clear instructions are fulfilled, which is one of the most important conditions that help stakeholders improve their work.

The managerial implication of this study is that the standardization of documentation and communication processes is important for a more effective implementation of construction contracts. Stakeholders in the construction industry should communicate efficiently and effectively during project implementations. Analyzing communication tools and instruments criteria is not enough. Examining which factors and patterns contribute to efficiency and whether they differ across different organization and environment is also crucial. Therefore, to be compatible with today's global market, appropriate communication tools and instrument are required for better communication. Moreover, communication strategies can be developed by deriving the best communication tools. Construction professionals should try to acquire new knowledge in communication skills and standardization as a whole in practice to fulfill the needs of the market.

The limitation of this research is that the data collected were limited in scope. The current study was carried out in Ipoh, Perak, a city with a population of slightly more than 600,000 people, which does not represent the whole country. Thus, further research on other parts of the country should be conducted to make generalization possible.

Future Research: The degree of acceptance of communication skills in the construction industry is still very low. Thus, we present some recommendation to improve the awareness and usage of communication skills and standardization in the construction industry. Related organizations can facilitate in advance more seminars or training programs on the usage of communication skills to introduce communication, its importance in standardization and its application in the construction industry. Organizations need to encourage and promote the use of better communication skills in the construction industry, where the top management is required to exhibit, support and apply good communication skills in their organizations. Educating their employees and their partner organizations about good communication skills is important. Organizations should have a proper standard as a guideline, procedures and policies on the work process to encourage good communication implementation in project planning.

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