

Effectiveness of Electronic Media in Project Communication

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Abstract—Electronic media was assessed to identify the most effective means to communicate project information during the Transnet (South African parastatal responsible for rail, port and pipelines) Capital Projects lifecycle. A quantitative study, in the form of a survey questionnaire targeting Transnet Executives, Senior Managers, Specialists and Operational staff based in 4 different locations (Johannesburg, Vryhurd, Ermelo and Richards Bay) was applied as a data collection instrument. The stratified random sampling technique was used to ensure that respondents were fairly selected across positions and geographical locations.

Old ways of communication that included email and telephone facilities were perceived to be highly effective in communicating project information to management at Transnet Capital Projects. On the other hand, intranet, video-conferencing, online notice board and facsimile were perceived to be poor in communicating project information to management. Similarly, the email and telephone electronic channels of communication were perceived to be highly effective in sharing project information among project teams. Likewise, the email and telephone electronic modes of communication were also perceived to be highly effective in communicating project information with clients and suppliers. Facsimile was ranked third after the email and telephone when communicating project information with clients and suppliers, though its effectiveness was still perceived to be low.

Therefore, in order to effectively communicate Transnet Capital Project information with stakeholders, Transnet leadership should ensure that all its sites (both remote and accessible) have adequate infrastructure to support email and telephone facilities, which are perceived to be relevant and cost effective.

I. INTRODUCTION

Communication is an important integral tool within any project but it is often neglected. The success of the project is determined by a set of crucial communication skills and techniques. Communication is defined as the process that enables people to co-orient their behaviours and empowers them to establish functional interpersonal relationships that allow them to work together towards goal attainment [8].

Project communication refers to information that flows between stakeholders [6]. Project communication starts with gathering all required information (for example: scope statement, schedule plan, resource plan, communication plan, project execution plan, drawing, construction management plan and specifications) before interpreting and then distributing the information as efficiently as possible to the affected stakeholders. According to [5], project communication management helps to sustain strong relationships among project sponsors and stakeholders and it facilitates team support and participation by providing the right information in the right format, delivered at the right time to the right person. The project manager as the leading person has to ensure that the right information gets to the

right people when required. The project manager needs to fully develop listening skills and effectively receive information through listening to opinions, questions and being able to understand and interpret communications from all project stakeholders. Further discussion by [13] suggest that effective communication is required to ensure that delivery of service is timely and efficient.

Fourie [4] states that communication system is created by different role players such as telephone companies (e.g. Telkom, Vodacom etc.), internet service providers, publishers, cable operators and cable operators. The continuous improvement on the communication system creates innovation through interaction and networking and adaptation to the fast changing socio-economic environment.

Sosa at al. [15] allude to the fact that the use of electronic media communication has influenced how the project teams communicate.

A. Problem Statement

Transnet Capital Projects is involved in a number of infrastructural projects that are scattered across provinces in South Africa. A number of such projects are failing to meet expectations in terms of time, cost and quality due to various reasons, some of which include funding, skills shortages and politics among other things. One main element that is critical and posing a lot of challenges to the capital projects' success at Transnet is project communication which coordinates all project activities. This study aims to assess the effectiveness of electronic communication media used in the project environment.

The main research question for this study is: How do the fragmented teams effectively communicate to ensure the project information is shared adequately using modern day communication tools (e-communication)?

The associated sub-question is: What are the preferred electronic communication channels that enhance project communication effectiveness?

B. Research Objectives

In order to address this problem, the following objectives are proposed:

- Identify the communication channels that are preferred to integrate and dissipate information among project teams.
- Determine the level of effectiveness of electronic media in projects across stakeholders.
- Identify barriers to information flow with the use of electronic communication channels during project deployment.
- Develop strategies to improve effectiveness of project communication through electronic communication media.

C. Research questions

- Q1: What are the most effective electronic media to communicate project information to managers during Transnet Capital Projects lifecycle?
- Q2: What are the effective electronic media that are used to communicate project information amongst project teams during Transnet Capital Projects lifecycle?
- Q3: What are the most effective electronic media that are utilized to communicate project information to suppliers and clients during Transnet Capital Projects lifecycle?

D. Limitations and Assumptions of the Study

The following parameters are some of the research study limitations:

- The study is limited solely to the Transnet's projects conducted in Gauteng, Vryhurd, Ermelo and Richards Bay.
- The organisation earmarked for this study is Transnet. Therefore only Transnet's project managers, project support service employees and operational employees participated in the survey by responding to questionnaires.

The research assumptions are:

- Transnet projects on the database are managed by the project managers who will be interviewed and the project managers will provide honest/reliable feedback.
- Project shareholders are using electronic communication media in projects.

II. PROPOSED MODEL OR CONCEPTUAL METHOD

This study is aimed at assessing the effectiveness of electronic media in project communication. [11] states that there is a need for businesses to embrace the new modes of communication in order to improve project performance. He believes that the electronic communication systems enable business to exchange information quicker and effectively to support their activities.

The implementation of the electronic communication system has helped organisation to transform from a function structure to a matrix, project-oriented form of organisation [3]. [3] conclude by saying that these changes would not have been possible, had it not been for the electronic communication systems.

A. Electronic media communication frameworks

1. Communication Styles and Tools

Mohamed and Stewart [10] state that electronic data interchange permits the information system to communicate directly with other computers, strengthening joint operations among organisations.

Koivula [7] defines project communication as an informative tool which is used for communication amongst project team members. Koivula [7] further states that the project manager should focus on information distribution (who should receive information and how the information is transmitted), in order for the communication to be regarded

as effective. There are three channels to communicate information among project team members. These are upward channel, downward channel and lateral channel.

The upward channel is about sharing the information with senior management which highlights risks, issues and exceptions. The preferred communication models are listed as emails, e communication documentation (weekly, monthly report etc.), video-conferencing and telecommunication. This channel mainly involves people who are readers, listeners and exchangers.

The downward channel is about sharing project information (scope of work, progress of work, meetings) particularly with project teams. Koivula [7] states that the downward channel requires delegation skills. Downward channel also applies to the end users. The preferred communication models in this channel are listed as emails, e-communication documentation (weekly, monthly report etc.), video-conferencing and telecommunication. This channel represents people who are exchangers, manipulators and viewers.

The lateral channel is mainly directed at the suppliers, vendors, clients and functional managers to communicate deals of the resources, time and budget allocation. It requires interaction and diplomacy. The Communication plan links all three channels together [7] in order to implement project communication. The preferred communication models in the lateral channel are listed as intranet, email, web browser and telephone. This channel represents people who are readers and exchangers. Communication channels, styles and tools are illustrated in Figure 2-1.

2. Other electronic Communication Channels

Ruuska [12] argues that communication is both a tool and resource in a project and should be compared to any other resources such as people, equipment, money and time. Ruuska [12] continues to argue that the communication should be planned for, like any other resources and it is an important tool to utilise other project resources effectively. McCauley [14] states that poor communication planning, implementation and divergent priorities of the stakeholders are one of the major contributors to failed projects.

According to Ruuska [12], a framework indicating communication styles, tools and channels in a project setup is shown in Figure 2.2. What is common between the theories above is that the flow of information between stakeholders is achieved successfully although there might be a delay in project information distribution. Ruuska [12] indicates that the project managers communicates with the Client through project electronic bulletins and follow up reports which can be sent via email. The project manager shares the same information with the end-users. The integration between these stakeholders is very crucial in ensuring that the exchange of information is flowing continuously. Ruuska [12] states that collaboration between these three groups (projects, clients and end users) can be taken as an official project communication channel.

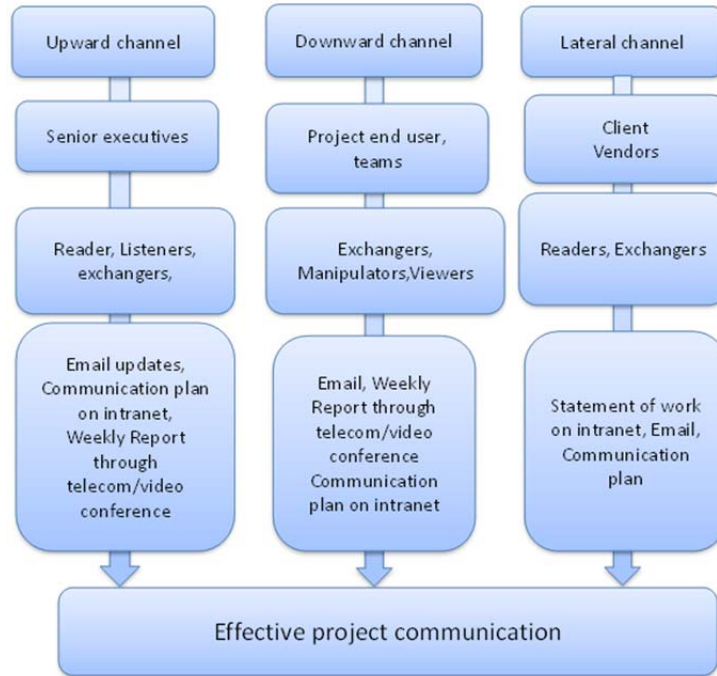


Figure 2-1: Communication styles, tools and channels [7]

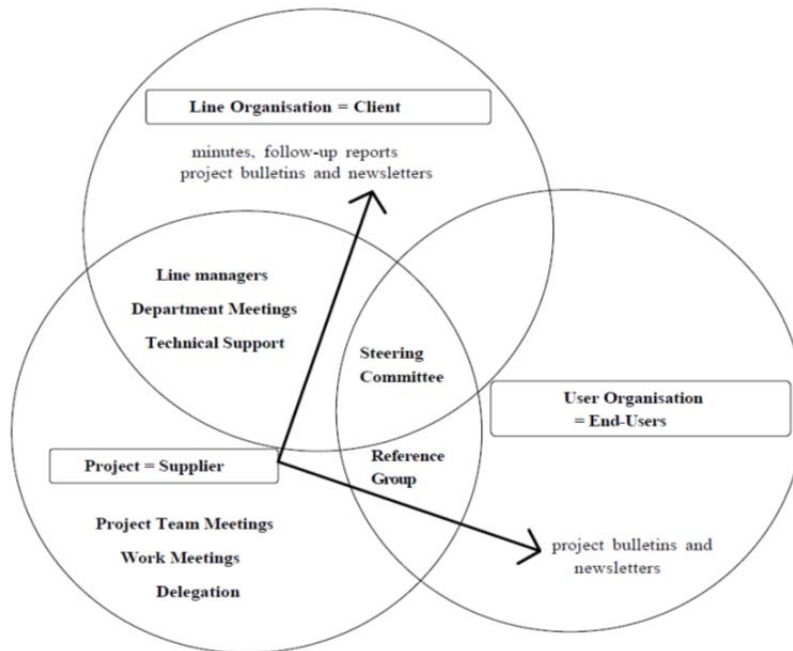


Figure 2-2: Communication styles, tools and channels [12]

Figure 2-2 illustrates that there are different channels, methods and styles of communication which are influenced by the organisation's objectives.

Koivula's communication model[7] was preferred over Ruuska's model[12] to analyse the effectiveness of electronic media in project as it is comprehensive and uses different methods and channels (top-down approach).

III. RESEARCH METHOD

Quantitative research studies are deeply rooted in numbers and statistics, and have the ability to effectively translate data into easily quantifiable charts and graphs in order to help understand the underlying issues and concepts. However, in order to make meaningful deductions, quantitative studies need sufficiently large sample sizes which are usually

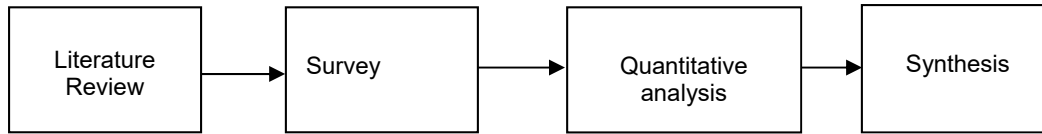


Figure 3-1: Research process

difficult to obtain and are expensive in terms of time and cost [9]. According to [2], qualitative studies are rich, in-depth and are laden with insightful thoughts.

Based on the merits given above, the researcher applied mainly a quantitative research method. However there were some qualitative questions in the questionnaire to get deep opinions on the issues posed. In order to assess the effectiveness of electronic media in project communication, quantitative method was chosen as the main method because it has the ability to translate the data into easily quantifiable charts and helps to understand underlying issues and concepts.

Figure 3-1 illustrates the detailed research details and process followed to complete the research study. The research study was conducted based on the literature reviewed, theories, models and methods identified. The questionnaires were drawn based on the pre-interview completed with six project managers based in Johannesburg. The survey questionnaires were distributed to participants for completion who were based in different regions. The data was collected and analysed as per the participant response. The conclusions and recommendations were drawn.

Stratified random sampling is a method in statistics that is used for sampling from a population that consists of subpopulations that vary considerably [16]. Stratified random sampling technique was applied in the study to ensure that respondents were fairly selected across positions and geographical locations.

IV. RESULTS

According to [9], data analysis processes raw data so that useful information can be extracted to support decision making. It is important to use the correct data analysis tools

in order to be able to meet the objective of the study. The effectiveness of electronic media to communicate project information during the Transnet Capital Projects lifecycle was assessed based on [7]’s model. This study was aimed at a confidence level of 90% and at confidence interval of 10%. With these tolerance levels, a minimum of 41 eligible responses is required [1, 17].

Out of a total of 70 questionnaires that were dispatched, 35 responses were received. This represents a response rate of 50%. The reliability of the instrument (questionnaire survey) was tested using Cronbach’s Alpha as shown in Table 5.1. A Cronbach’s Alpha of 94% was achieved. This is way above the 70% threshold. Therefore it can be concluded that the measuring instrument is able to give consistent results in repeated use.

A. Effectiveness of electronic communication channels to management

Table 4.2 shows the perceptions of participants on the effectiveness of channels to communicate project information to management. Participants were of the view that email facility is the most effective channel to communicate project information to management. About 74% of the participants rated the effectiveness of email as high while about 17% rated it as medium. The effectiveness of the email channel to communicate project information to management recorded a mean score of 2.8 out of a possible maximum of 3.

The telephone communication channel was in the second slot with a mean score of 2.2 out of a possible maximum of 3. About 57% of the participants rated the effectiveness of the telephone channel to communicate project information to management as high. Video-conferencing, Intranet and Online notice board were ranked third, fourth and fifth respectively.

TABLE 4-1: MEASURING RELIABILITY OF THE INSTRUMENT USING CRONBACH’S ALPHA.

Reliability statistics		
Cronbach' Alpha	Cronbach' Alpha (Standardised items)	No. of items
93.80%	94.10%	82

TABLE 4-2: PERCEPTION OF PARTICIPANTS ON THE EFFECTIVENESS OF CHANNELS TO COMMUNICATE PROJECT INFORMATION TO MANAGEMENT

Medium	%Low (1)	%Medium(2)	%High(3)	Modal preference	Mean score	Ranking
Email	0.0	17.1	74.3	3	2.8	1
Telephone	5.7	11.4	57.1	3	2.2	2
Video-conferencing	22.9	25.7	11.4	0	1.2	3
Intranet	25.7	17.1	14.3	0	1.1	4
Online notice board	28.6	11.4	5.7	0	0.8	5
Fax	42.9	0.0	0.0	0	0.5	6
Other	5.7	5.7	5.7	0	0.4	7

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TABLE 4-3: PERCEPTION OF PARTICIPANTS ON THE COMMONLY USED ELECTRONIC COMMUNICATION CHANNEL THAT TRANSNET USES TO SHARE INFORMATION AMONGST PROJECT TEAMS

Medium	%Low (1)	%Medium(2)	%High(3)	Modal preference	Mean score	Ranking
Email	0.0	8.6	71.4	3	2.7	1
Telephone	11.4	25.7	51.4	3	2.5	2
Intranet	28.6	14.3	20.0	0	1.3	3
Video-conferencing	28.6	11.4	11.4	0	0.9	4
Online notice board	28.6	5.7	2.9	0	0.5	5
Other	8.6	0.0	8.6	0	0.4	6
Fax	31.4	0.0	0.0	0	0.3	7

TABLE 4-4: PERCEPTIONS OF PARTICIPANTS ON THE EFFECTIVENESS OF ELECTRONIC COMMUNICATION CHANNEL TO COMMUNICATE WITH CLIENTS AND SUPPLIERS.

Medium	%Low(1)	%Medium(2)	%High(3)	Mode	Mean score	Ranking
Email	2.9	8.6	71.4	3	2.6	1
Telephone	8.6	14.3	54.3	3	2.3	2
Intranet	28.6	2.9	17.1	0	1.0	3
Video-conferencing	31.4	5.7	5.7	0	0.7	4
Fax	28.6		8.6	0	0.6	5
Online notice board	20.0	5.7	5.7	0	0.5	6
Other	8.6		8.6	0	0.4	7

B. Determining effective electronic media to communicate project information amongst project teams

1. Establishing commonly used electronic communication channel to share information amongst project teams

Table 4.3 shows the perceptions of the participants on the commonly used electronic communication channel that Transnet uses to share information amongst project teams. About 71% of the participants were of the view that email facility is highly used in sharing information amongst project teams. Email channel was ranked first with a mean score of 2.7 against a maximum possible of 3. In the second spot was the telephone communication channel where about 51% of the participants were of the idea that this communication channel (telephone) is also commonly used to share information amongst project teams. The telephone communication channel recorded a mean score of 2.5 on this aspect. Intranet, Video-conferencing and Online notice board communication channels occupied third, fourth and fifth positions respectively with mean scores that are lower than the half way mark of 1.5.

C. Determination of the degree of effectiveness of selected electronic communication channel to communicate with clients and suppliers

Perceptions of participants on the effectiveness of selected electronic communication channel to communicate with clients and suppliers are illustrated in Table 4.4 Based on the participants' perceptions, a significant 71% were of the idea that email electronic communication channel is the most effective channel to communicate with clients and suppliers at Transnet. About 54% of them were of the view that telephone communication channel is also effective to communicate with clients and suppliers. Email and telephone were perceived to be the most effective communication channels when sharing information with clients and suppliers with mean scores of 2.6 and 2.3 respectively against a maximum possible score of 3. On the other hand intranet,

video conferencing and facsimile were ranked third, fourth and fifth respectively with mean scores of at most 1. Telephone was preferred channel of communicating with clients and suppliers at Transnet as it was perceived to be quick, readily available and reliable. Email was preferred for the reason that it is cost effective, possible to trace and is reliable depending on the network coverage.

V. CONCLUSIONS AND RECOMMENDATIONS

The results of the study revealed that even though the world of communication has changed so much in the last few years, old ways to communicate such as email and telephone are still the most used and preferred electronic communication channels to communicate project information to different stakeholders that include Transnet project team players, management, suppliers and clients. Email and telephone electronic communication channels were mostly ranked number 1 and 2 respectively. Email electronic communication channel was preferred as it is traceable (audit trail), is easy to use and is cost effective. However, any report sent by e-mail needs a follow-up to assure that the person even looked at it.

Telephone facility was preferred as it is easy to use, readily available, relevant and a quick response is often obtained. Email and telephone electronic communication channels were particularly identified as effective in ensuring that daily sharing of information is accomplished among project stakeholders at Transnet while video conferencing and intranet were ideal for sharing information monthly. On line notice board and facsimile were seen to be ineffective in sharing project information amongst stakeholders at Transnet. Respondents were of the view that despite differences in infrastructural developments in Johannesburg and Richards Bay Transnet offices, only email and telephone channels were effective in communicating project information amongst various stakeholders in both of these offices. Email and

telephone channels are an alternative to face to face communication which is not cost effective considering the distance to be covered to reach some projects that are located in remote sites with unreliable basic telecommunications infrastructure.

In order for Transnet to achieve effective communication (using alternative ways of communication other than face to face, which is not cost effective) with stakeholders during project implementation, the following recommendations can be considered:

- Transnet management should ensure that all its sites (both remote and accessible) have adequate infrastructure to support email and telephone facilities, which are preferred for their effectiveness in communicating Transnet Capital projects information,
- For remote sites, the use of a combination of email and telephone facilities to relay project information to decision makers at Transnet is recommended. These communication channels are usually supported with basic infrastructural requirements. However, the use of these channels is also dependent on the urgency and the nature of the information to be shared,
- Email, telephone and video conferencing can be used in accessible areas (such as urban areas) that have adequate infrastructure to provide support. The application of each of these channels or a combination is dependent on the nature of the information, urgency and cost issues.

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