Examining the challenges associated with the implementation of project scope management in telecommunication projects in Somaliland [1]

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Abstract

This paper presents the results of an investigation that provides insights on the challenges encountered when implementing project scope management in telecommunication projects in Somaliland. Prior to the questionnaire design, a detailed literature review was carried out to identify 11 possible factors that affecting the adoption of project scope management practices in telecommunication projects. A total of 75 structured questionnaires were administered to obtain the opinions of the stakeholders in the Somaliland telecommunication industry, regarding the identified challenges. SPSS Statistics Software and Microsoft Excel Packages was then used to analyze the collected data. This was achieved by computing the Cronbach's Alpha, mean values and Relative Importance Index (RII), respectively, for reliability check and ranking purposes. The results from the analysis indicate that poor communication/miscommunication (RII = 0.694), scope creep (RII = 0.651), unrealistic timeline (RII = 0.643) and unsettled technical uncertainties (RII = 0.605) are the four most ranked challenges associated with the implementation of project scope management in the telecommunication industry, respectively. The implications of the results obtained from this study are also discussed before providing recommendations on the appropriate scope management procedures required to manage the identified key challenges when executing future telecommunication projects.

Keywords: Application of Scope Management, Project Management, Challenges hindering Project Scope Management Practices, Telecommunication Projects, Somaliland

Introduction

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In recent years, successful project managers are aware that a careful scope control is vital to time and cost delivery of projects (Charvat, 2003). Consequently, they now pay adequate attention to project scope management (Dexter, 2010; Frame, 2003). This is because, it has been established in prior work that the failure to appropriately define or productively manage the scope of a project would lead to total project breakdown, late delivery or over budget (Chua, Kog, & Loh, 1999; Keivanpour, Kadi, & Mascle, 2015; Khan, 2006; Nath & Momin, 2014). Furthermore, with a vast competitiveness in the telecommunication industry, project managers are now faced with the task of successfully executing assigned projects based on a well-defined project scope that can help accomplish the overall projects goals and objectives (Khan, 2006). This implies that the success or failure of projects, particularly in the telecommunication industry, is dependent on how productive the scope management is. In addition, scope management ensures that a project's scope is accurately defined and mapped, and enables project managers to allocate the proper labor and costs necessary to complete the project.

Project scope management is about planning and controlling (Dumont, Gibson, & Fish, 1997). Managing the expectations of clients and stakeholders can be one of the most difficult tasks a project manager can be faced with. Basically, a distinct scope helps all parties involved in a project to stay on the same page throughout the lifecycle of the project. Thus, effective scope management can ensure that some of these issues are avoided by clearly defining and communicating the scope to all parties involved in the project. Project scope can help differentiate between what is and what is not involved in a project and controls what is allowed or removed as it is implemented (Bingham & Gibson, 2017; Cho & Gibson, 2001; Dumont et al., 1997). Scope management also creates control factors, that can be utilized when addressing elements that are the consequences of changes during the lifecycle of the project. Project scope is therefore critical, and without it, project managers would have no clue of what time, cost or labor involved in a project. Moreover, scope management serves as the basis for every decision a project manager will make on a job and when it is required to be changed (Bingham & Gibson, 2017; Cho & Gibson, 2001; Dumont et al., 1997).

However, managing project scope is largely concerned with defining and controlling what is and is not included in the project. According to Dekkers and Forselius (2007), scope management plays a central role in an information technology project like in the telecommunication industry. They further established that scope management has strong relations to several of the project management knowledge areas, of which they identify time, cost, quality, and risk management (Atkinson, 1999; Dekkers & Forselius, 2007). The authors believe that scope management is more important than any other of the individual knowledge areas and processes in projects. In an effort to support this argument, the authors present information that explained why 60-99 percent of all defects latent in production software could be attributed back to the requirements phase (Atkinson, 1999; Dekkers & Forselius, 2007).

Taking a closer look, the problem with project scope in telecommunication projects may arise from a number of factors (Gutierrez & Berg, 2000; Ogunberu et al., 2018). First, ambiguity in scope mostly leads to misunderstanding and redundant work in telecommunication projects. This is sometimes experienced during the installation or expansion of fiber optic technology. Another problem associated with scope management in telecommunication projects is the incompleteness and inaccuracy of project scope (Ogunberu et al., 2016). This often causes unnecessary schedule

mistakes and cost overrun in telecommunication projects. The third challenge that can be related to scope management is having a transient project scope. This is the root cause of lateness in project deliveries and sometime an unending project (Young, 2007). Lastly, when a project scope is not collaborated, it is seen as a great issue in telecommunication projects because it often leads to misinterpretation of the project requirements and design.

In spite of the increasing implementation and development of information and communication technology projects across Africa (including Somaliland) particularly, in the telecommunication sector (Ogunberu et al., 2018), quite a number of these projects have recorded high failure rates, perhaps, as a result of poor project scope, design and management (Gutierrez & Berg, 2000). This is why the telecommunication industry and their project managers/teams are exploring ways, processes and methods involved in managing projects in order to improve the success rates (Gutierrez & Berg, 2000). Within this context, the telecommunication companies in least developing countries need to pay additional attention to project scope management practice in order to sustain market share and safeguard return on investment, profitability and client demands. There is therefore a need to explore the challenges encountered in the course of implementing project scope management in telecommunication projects in Somaliland.

To fill in the identified gaps and contribute to knowledge in this regard, this study investigates the challenges hindering project scope management practices in the telecommunication industry. This study also attempts to provide noteworthy information that can guide the future project managers on the identified challenges encountered when executing telecommunication projects and how to successfully overcome them. Moreover, the current paper further provides new insights that could guide telecommunication stakeholders, decision-makers and policy-makers in the development and formulation of future strategies and measures on the application of project scope management in telecommunication projects.

Theory

Phases of Project Management Lifecycle

In order to deliver adequate products and services or reach the expected project outcomes, projects undergo certain processes known as the "phases" of such projects. In general, the project phases are referred to as the project lifecycle (Project Management Institute, 2008). The lifecycle of a project can be seen as the sequence of activities that occur from the start to the end of a project. Moreover, the Project Management Institute has pinpointed five phases of a project that shape the constituents of any project lifespan irrespective of its size, nature or location (Project Management Institute, 2008). Consequently, organizations executing projects now take initiative to divide each project into numerous project phases in order to improve management control on such projects. The lifecycle of these projects thus includes:

Initiation Process

This is the first stage of every project, once a client or organization has identified the need to implement a project for a desired objective. This stage involves initiating and answering questions such "what do you need to do" (Charvat, 2003; Project Management Institute, 2008). In the initiating processes of a project, the project/business needs, problems or opportunities are figured

out, before brainstorming the ways that the needs can be met (Fageha & Aibinu, 2013). During this phase, the project objective is identified to know if the project is feasible and the key deliverable are also identified for the project (Kerzner, 2014; Liu & Walker, 1998).

Planning Process

The second phase of a project is quite significant. This is because it provides guidance for procuring resources, obtaining financing and acquiring required materials (Charvat, 2003). The project plan also provides the required team direction for making quality outputs, managing risk, creating acceptance, communicating benefits to stakeholders and handling suppliers (Charvat, 2003; Frame, 2003). The project planning further helps the teams to understand the cost, scope and time frame of the project (Charvat, 2003; Kerzner, 2014).

Executing Process

This phase of a project is typically associated with project management. The executing stage is obviously the lengthiest in the project management process. This is because the execution stage is the actual work period. At this stage of the project, the project teams collaboratively review and present work to stakeholders. This stage also involves building deliverables that satisfy the client (Charvat, 2003). This is achieved through the team leaders by allotting resources and keeping team members engrossed in their assigned duties or tasks. However, it is important to note that the success of this stage is highly dependent on the planning phase and determine if a project will succeed or fail (Charvat, 2003; Project Management Institute, 2008).

Monitoring and Control Process

This is the fourth stage of a project. It is a critical stage that ensures the smooth running of the project according to set plans. As part of the project monitoring phase, a project manager is expected to keep an eye on the "budget", "timeline", "project goal", "quality of deliverable" and "team performance". This stage is combined with the execution phase since they occur at the same time. It is thus important for project teams to continually monitor their own progress when executing their project plan to prevent scope creep, calculate key performance indicators and track variations from allotted cost and time (Atkinson, 1999; Charvat, 2003). This assists the project to prevent project failure, and review why projects are possibly going to fail.

Closing Process

The closing process is the last stage of a project. It refers to the process that formally terminate or conclude all tasks, activities, and component parts of a particular project or phase of a project (Atkinson, 1999; Charvat, 2003; Frame, 2003; Kerzner, 2014). This is the final but vital step in the project lifecycle that allows the team to assess and document the project. This involves the handing over of all works that had been assigned to the contractor base on the contractual agreement in case a contractor was employed on the project.

Constraints of Project Scope management

Project constraints are anything that can either limit the actions of project team or commands their actions (Atkinson, Crawford, & Ward, 2006). The project triple constraints are mainly scope, time

and cost while the enhanced constraints include time, cost, risk, scope, quality, resources, and customer satisfaction (Khan, 2006). The triple constraints work collectively with each other meaning that a change in one directly affects the other two. Time constraint is typically offered in the form of obligatory deadline within which the project is expected to be finished (Atkinson et al., 2006; Khan, 2006). This is enforced by the senior management.

Furthermore, budget or cost constraint restricts the project's capability to use funds on the project. It thus has the potential of limiting the project scope. It is the scope elements that define the deliverables and the boundaries within which the project will be executed (Atkinson et al., 2006). For quality constraints, restrictions are determined by the specifications of the product or service and also the anticipated standards that are essential. Resource constraint deals with availability of internal and external resources for project implementation in terms of needed skills, quantity, experience and so on (Atkinson et al., 2006; Khan, 2006).

Research methodology

This study adopts a questionnaire survey method to explore the significant challenges encountered during the implementation of project scope management practices in telecommunication projects in Somaliland. A quantitative research was utilized to obtain information and data from the target population via field sources. The sample size of 75 respondents from a population of 90 was used in the study. This was determined using the Krejcie and Morgan's table for determining small-sample size from a given population. The full information concerning the table can be explored in (Krejcie & Morgan, 1970). In an effort to directly acquire actual information from the respondents, structured questionnaires were utilized to obtain primary data in this study via self-administration. A total of 11 possible challenges associate with the implementation of project scope management practices were investigated in this study. Also, these challenges were rated in this study based on the Likert's scale of 5 ordinal measures from 1 to 5 according to the level of contribution (Allen & Seaman, 2007).

In order to confirm that a right level of quality in the research instrument is accomplished in terms of its consistency and steadiness, a pilot survey was carried out. This was attained using a convenience sample of experts in the telecommunication industry to individually review the questionnaire. Prior to the distribution of the questionnaires, three soft copies of the questionnaire were provided to three telecommunication practicing experts, one in Nigeria and two in Hargeisa to the validate the contents of the questionnaire and to ensure that the sentences are precise and concise, accordingly.

The reliability of the collected data was tested using the Cronbach's Alpha method (Cronbach, 1951). This is achieved by employing SPSS Statistics Software (version 25) to compute the Cronbach's Alpha, and the reliability coefficient was determined to show the internal consistency of the data using Equation 1 (Cronbach, 1951):

$$\textbf{Cronbach's alpha, } \alpha = \frac{K}{K-1}\left[1 - \frac{\sum V_i^2}{V_x^2}\right] \qquad (1)$$

where K, represents the number of items; V_i represents the variance of scores on each item; and V_x, represents the variance of the observed total test scores.

Before the analysis of the collected data, the information provided through the questionnaire was filtered, and entered into Microsoft Excel spreadsheets. The processing of the data into the required information was geared toward reading and understanding the answer provided in the filled-out/completed questionnaires. Relative Importance Index (RII) was selected as a suitable analytical method (Doloi et al., 2012) used to analyze the ratings received through the questionnaires and establish a mean rating point. Each calculation was carried out using RII formula in Equation 2 (Doloi et al., 2012):

$$\textbf{Relative importance index, RII} = \frac{\sum W}{A \times N} \qquad \textbf{(2)}$$

where W, represents the rating given to each factor by the respondents. For instance, 5 is for very high contributing factor, 4 is for high contributing factor, 3 is for average contributing factor, 2 is for low contributing factor and 1 is for very low contributing factor. A is the highest weight (5 for this study) and N represents the total number of samples (50 for this study).

In addition, the study was carried out according to standard ethical practices required of any reputable academic research. Respondents were informed both orally and in writing regarding the goal of the study and their consents was established before completing the questionnaires. Respondents were also assured of confidentiality.

Results and discussion

Survey results

Out of the 75 questionnaires randomly distributed among the target respondents, 59 questionnaires were returned, 16 respondents were unable to make available the questionnaires. However, of the 78.7% responses received from the participating professionals, 9 questionnaires were recorded invalid, and 50 questionnaires were deemed valid (See Figure 1).

Concerning the respondents' educational background, Figure 2 shows the respondents with bachelor's degree have the highest percentage (50%). The respondents with Master's degree are found to have the second highest percentage (34%.) The respondents with technical school certificate are found to have the third highest percentage (8%). Meanwhile, the respondents with diploma and PhD degree are found to have the least percentage (4% each). This implies that out of the 50 valid respondents, 4 are technical school holders, 2 are diploma holders, 2 are PhD holders, 17 are master's degree holders, while the remaining 25 are bachelor degree holders.

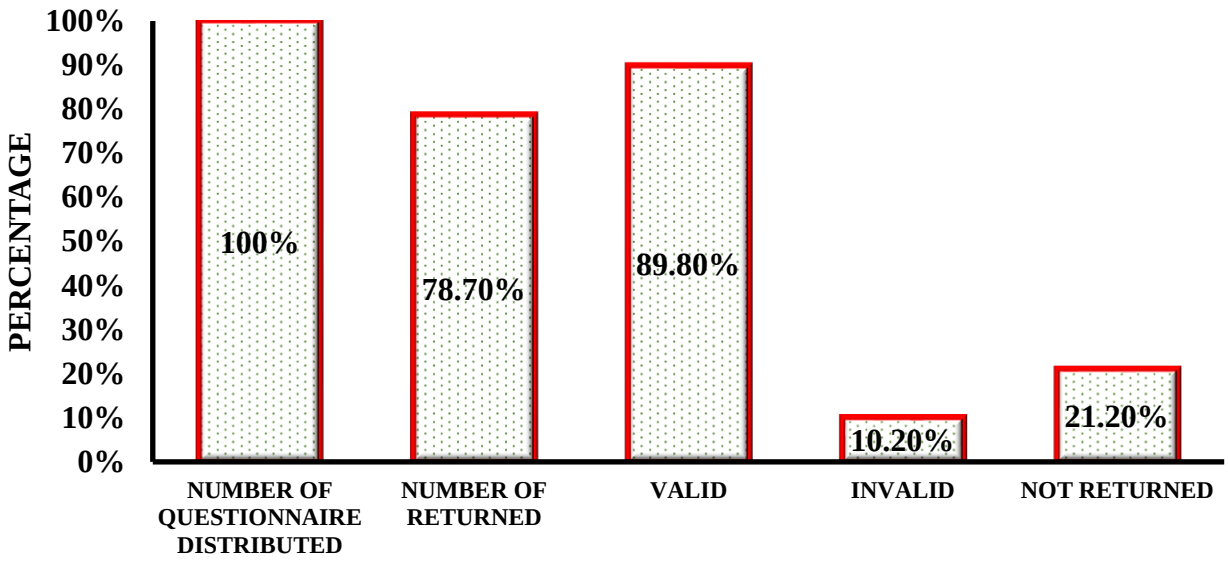

Figure 1: Response rate of target respondents (%)

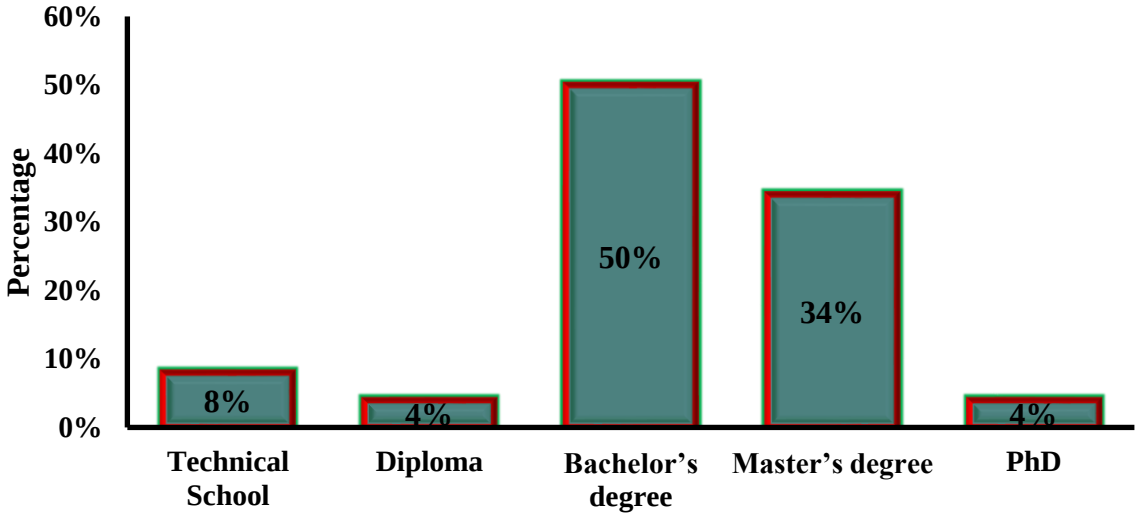

Figure 2: The percentage distribution of respondents' level of education

It can be observed from Figure 3 that the respondents' experience in telecommunication projects are not evenly distributed. This is because 80 % of the respondents have been involved in 1 to 6 telecommunication projects i.e. 40% have experience with 1-3 projects and another 40% have been involved in 4 to 6 telecommunication projects. Nevertheless, the other 20% of the respondents have been involved in 7-10 projects (4%) or over 10 projects (16%).

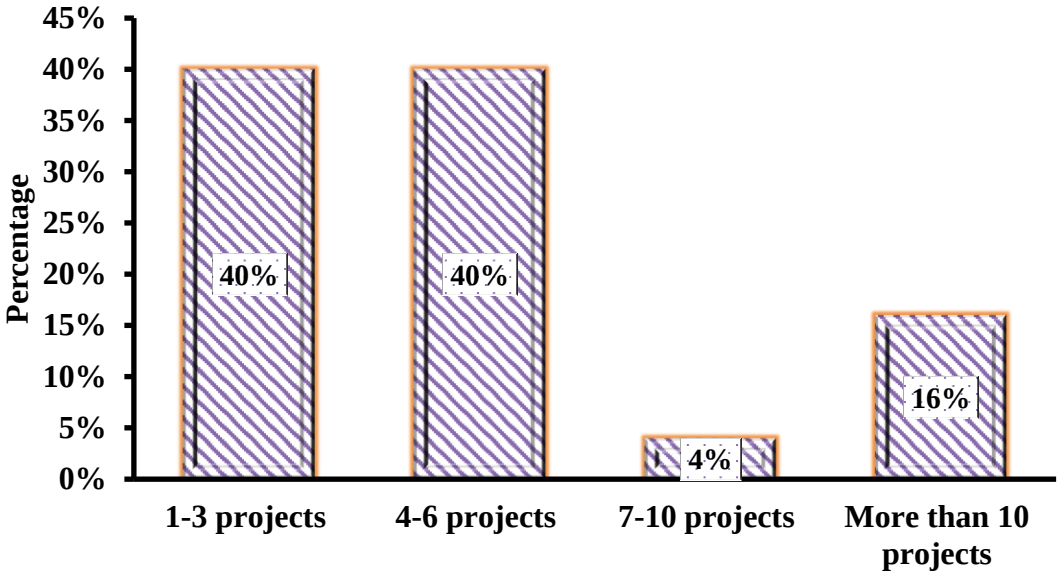

Figure 3: The number of telecommunication projects that the respondents have been involved in

Cronbach's alpha data reliability test

The results of the Cronbach's Alpha data reliability test were acquired prior to the data analysis in order to measure the internal consistency of the answers provided by the respondents, using the Likert's scale. Also, the internal consistency of the answers provided by respondents was determined based on the Cronbach coefficient obtained, using Table 1 (Gliem & Gliem, 2003).

The results of the Cronbach's Alpha reliability test conducted for the answers received with respect to the 11 challenges examined in this study show that the Cronbach's Alpha values is 0.898, indicating that the internal consistency of the questions in this study is excellent. This means that the answers provided by the respondents, concerning the identified challenges has an excellent reliability of 89.8%.

Table 1: Internal consistency of Cronbach's Alpha

S/N	Cronbach's alpha, α	Internal consistency
1	$\alpha \geq 0.8$	Excellent
2	$0.8 > \alpha \geq 0.7$	Good
3	$0.7 > \alpha \geq 0.5$	Satisfactory
4	$\alpha < 0.5$	Poor

Analysis of the challenges encountered when implementing project scope management

The 11 identified challenges have been ranked based on Relative Importance Index (RII) and Mean Value. To establish the level of significance of the different challenges encountered when implementing project scope management in telecommunication projects, the RII and Mean Value rankings are classified based on the RII classification table presented in Table 2.

Table 2: Classification of RII

Scale	Level of contribution	RII
1	Very low	$0.0 \leq RII \leq 0.2$
2	Low	$0.8 < RII \leq 0.4$
3	Average	$0.4 < RII \leq 0.6$
4	High	$0.6 < RII \leq 0.8$
5	Very high	$0.8 < RII \leq 1.0$

The analysis of the challenges confronted when implementing project scope management in the telecommunication industry is presented in Table 3. According to the perception of the respondents, Table 3 revealed that poor communication/miscommunication (RII = 0.694) is the most ranked challenge confronted when implementing project scope management in the telecommunication industry. In addition, scope creep (RII = 0.651) is ranked second, unrealistic timeline (RII = 0.643) is ranked third, unsettled technical uncertainties (RII = 0.605) is ranked fourth, scope change (RII = 0.600) is ranked fifth, insufficient technical skills (RII = 0.591) is ranked sixth, inadequate understanding of project and product scope (RII = 0.571) is ranked seventh while insufficient customer needs assessment (RII = 0.563) is ranked eighth, The level of contribution of the top five challenges faced when implementing project scope management is found to be high. Moreover, the failure to appropriately link business value to technical functionality at the requirement gathering stage (RII = 0.525), unclear definition of project and product scope statement (RII = 0.543), and complex project scope statement (RII = 0.557) are the three least important challenges.

The implications of the results obtained in this research work are of high importance. First, they show that there exist some challenges that hinders the implementation of project scope management in telecommunication projects which in turn affects the overall project success. The results of the study further signify that project scope management can play a central role in telecommunication projects, in terms of needed skills, quantity, and experience. In addition, the results of the current work disclose that poor communication or miscommunication and scope creep are the top two most common challenges faced when implementing project scope management in telecommunication projects in Somaliland. On one hand, this isn't surprising though, since it is a well-known fact that scope creep is majorly instigated by internal miscommunication and disagreements among the main project stakeholders regarding changing requirements (Khan, 2006). However, one can thus trace the challenges related the scope creep change, scope change and poor communication/miscommunication among the stakeholders (the three most significant challenges) to poor understanding of project and product scope, as depicted

in Table 3. On the other hand, this is contrary to the work by Ogunberu et al. (2018) that revealed that the top two most significant factors that affect the adoption of project scope management practices in the telecommunication firms in Nigeria are competitive advantage and complex project scope statement. This implies that the perception in Nigeria is different from that of Somaliland.

On can also argue that although the respondents selected unsettled technical uncertainties and insufficient technical skills as the fourth and sixth most significant challenges encounter, the project managers in the telecommunication companies in Somaliland seem to understand the importance of scope management in telecommunication projects (Samset & Haavaldsen, 1999). This is because the findings in Table 3 indicate that failure to appropriately link business value to technical functionality at the requirement gathering stage, unclear definition of project and product scope statement, and complex project scope statement are the three least challenges encountered when implementing project scope management. However, we can also say that these project managers are mostly surrounded with inexperience personal (Samset & Haavaldsen, 1999).

Table 3: The Mean Score Value and RII ranking for challenges encountered when implementing project scope management in telecommunication sector

S/N	Challenges encountered when implementing project scope management	RII	Mean value	RII & Mean value ranking	Level of contribution
1	Unclear definition of project and product scope statement	0.543	2.714	10	Average
2	Complex project scope statement	0.557	2.783	9	Average
3	Inadequate understanding of project and product scope	0.571	2.857	7	Average
4	Insufficient technical skills	0.591	2.956	6	Average
5	Failure to appropriately link business value to technical functionality at the requirement gathering stage	0.525	2.623	11	Average
6	Unsettled technical uncertainties	0.605	3.023	4	High
7	Insufficient customer needs assessment	0.563	2.813	8	Average
8	Scope change	0.600	3.000	5	High
9	Scope creep	0.651	3.255	2	High
10	Unrealistic timeline	0.643	3.217	3	High
11	Poor communication/Miscommunication	0.694	3.468	1	High

Conclusions

In conclusion, this research work has examined the significant challenges encountered when implementing project scope management in telecommunication project. A total of 11 of these challenges have been identified and analyzed to successfully reach the objective of this research work. Of the 11 challenges investigated in this study, the following are the top five most significant 11 challenges faced when implementing project scope management in the telecommunication industry: poor communication/miscommunication (1st); scope creep (2nd); unrealistic timeline (3rd); unsettled technical uncertainties (4th) and; scope change (5th), as depicted in Table 3. The two least important challenges are found to be failure to appropriately link business value to technical functionality at the requirement gathering stage and unclear definition of project and product scope statement, respectively.

Furthermore, the main contribution of this study is providing an improved understanding on the challenges encountered in the course of implementing project scope management practices in telecommunication projects. The findings from this study will also provide evidence-based insights that could guide the development of new measures or strategies needed for future implementation of project scope management in the telecommunication industry. This is however vital to the success of any telecommunication project.

Moreover, in an effort to ensure profitability, continued market share and better return on investment, and to avoid the major identified challenges hindering the implementation of project scope management practices in telecommunication projects, telecommunication companies should continuously organize training activities that will update the knowledge of their staff to become familiar with the necessary project management skills.

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