

Influence Of Information Communication Technology On Project Completion In Small And Medium Enterprises, In Juba County, South Sudan

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Abstract

The purpose of this research was investigating the influence of Information Communication Technology (ICT) on the completion of project of Small and Medium Enterprises in Juba County, South Sudan. The independent variable for the study was information communication Technology as measured by digital communication tools, project management systems, and automated document management systems. The dependent variable of the study was successful project completion, which is defined as completing the project on time and on budget while attaining the goals and objectives of the project. To ascertain the impact of ICT on project completion in Small and Medium Enterprises, In Juba County, South Sudan. The Diffusion Theory and the Technological Acceptance Theory serve as the study's main theoretical pillars. This study applied a descriptive research design. The target population consisted of 13,348 licensed SMEs in Juba County, South Sudan. The sample size was determined using simple random sampling technique and stratified sampling techniques. The sample size was computed using Cochran's formula. There were 96 SMEs in the sample. Self-administered questionnaires were utilized to gather the data. The study yielded a response rate of 52%, and the data gathered was analyzed with the help of the Statistical Package for the Social Sciences (SPSS) Version 22. This analysis encompassed both descriptive and inferential statistical methods. Descriptive statistics, exemplified by frequencies, percentages, means, and standard deviations, were used for data summarization and presentation. Furthermore, inferential statistical techniques, for instance correlation and regression analysis, were employed to investigate relationships and make predictions based on the acquired data. Most of the respondents agreed, based on the descriptive statistics, that information communication Technology as measure by project management systems, automated document management system and digital communication tools) has a positive influence on project completion in SMEs in Juba County South Sudan. The calculated mean of 4.404 indicates that a significant proportion of respondents expressed a strong agreement regarding the influence of the project management system on project completion. The results of correlation study demonstrated a high positive correlation between the use of Digital Communication Tools and Project Completion ($r = 0.983$, $p < 0.01$). There is no significant correlation between the use of Automated Document Management System and Project Completion ($r = -0.019$, $p > 0.05$). A strong positive correlation exists between the use of Project Management System and Project Completion ($r = 0.986$, $p < 0.01$). Regression analysis showed that 98.2% of the variation in project completion are due to the changes in the three variables project management System, automated document management system and digital communication tools. According to regression analysis, increasing the use of digital communication tools by one unit will increase project completion by 0.421 units, increasing the use of automated document management systems by one unit will increase project completion by 0.111 units, and increasing the use of project management systems by one unit will increase project completion by 0.554 units. The researcher concluded that while automated document management systems have an insignificant influence on project completion in SMEs in Juba County, South Sudan, digital communication tools and project management systems have a strong positive and significant relationship with project completion in SMEs in Juba County, South Sudan. The researcher gave recommendation that management and other stakeholders should foster a culture of technology adoption and innovation within SMEs because it has been observed to positively influence project completion. Further studies have been recommended of a similar study but covering a different geographical area

Keywords: Digital communication tools, automated document management systems, Information Communication Technology, project management system Project Completion

Date of Submission: 22-01-2024

Date of Acceptance: 02-02-2024

I. Introduction

Small and Medium Enterprises (SMEs) form more than half of all business globally as well as more than half of all employment in Australia and United Kingdom; and in Europe is around 99 per cent for all the employment (Alam & Noor, 2009). South Sudan's SMEs sector remain at its beginnings, rising from the

consequences of a long civil conflict that ruined the whole nations physical infrastructure, social-economic, socio-cultural, and financial institutions, and relocating and depriving almost the all population (Arok, 2019). Small and Medium Enterprises (SMEs) represent crucial economic pillars in various nations, exemplified by their substantial contributions to GDP and employment. In Kenya, they contribute an estimated 25% to the Gross Domestic Product (GDP) and employ over 80% of the workforce, serving as vital engines for job creation, income generation, and poverty reduction (MIED, 2015; Kiveu & Ofafa, 2013). Similarly, in South Sudan, SMEs form the backbone of the economy, constituting approximately 93% of registered businesses (Abbass Ali, 2022).

Throughout history, a number of huge projects have been completed successfully. Today's project, however, are more challenging and complex in comparison to the earlier times because they involve huge cost, time limited, standard quality among other factors. Owing to this forthcoming, Information Communication Technology (ICT) has been found to perform a major factor in influencing project management practice. Recent technological advancements and management tools have contributed to numerous benefits of ICT adoption, such as increased efficiency, reduced costs, improved communication, and enhanced decision-making (Wang, Chen, & Liang, 2022; Zhang, Xiong, & Wang, 2021).

Matambalya and Wolf (2010) conducted a study in Kenya and Tanzania aimed on assessing the effect of ICT on the performance of SMEs. A total number of 3000 SMES were sample from both Tanzania and Kenya. The survey found that SMEs in Kenya and Tanzania had been using ICT more often over time. Even while it was still lower in Kenya than Tanzania, fixed line phone usage had peaked. The usage of mobile phones was rising, though it was more common in Kenya than Tanzania. The usage of ICT by businesses led to superior performance than that of non-ICT businesses, it was found. The survey's results showed that 88% of users who utilized ICT improved management efficiency and 76% increased corporate competitiveness. Following fixed phones and fax machines, most businesses claimed that mobile phones made a notable contribution to the growth of the regional market.

Statement of the Problem

Small and medium Size enterprises in South Sudan are the backbone of the economy contributing to 93% of the registered businesses (Abbass Ali, 2022). They are key drivers of employment creation, economic growth and poverty reduction. However, the management and performance of SMEs in South Sudan the management and performance of SMEs have been mixed, with up to 45% of them not making it past their 5th anniversary (Omer, 2018). Understanding the reasons behind their failure is crucial, particularly in Juba City, South Sudan. Studies on SME performance in Juba, South Sudan, have identified several causes contributing to high failure rates. Arok, Kirimi, and Munga (2019) highlight resource allocation and management innovation as potential causes of this failure. Concurrently, Bauer (2010) emphasizes critical success factors such as customer satisfaction, timely project delivery within budget constraints, and maintaining quality standards. Leveraging Information Communication Technology (ICT), known for its cost reduction and efficiency improvement, holds promise for enhancing project success in SMEs in Juba County. Previous research substantiates the positive impact of ICT on project completion. Despite the extensive studies globally, regionally, and locally on the impact of ICT on project completion, none have specifically targeted SMEs in Juba County, South Sudan. Consequently, this study aims to bridge this gap by examining the influence of ICT on project completion within SMEs specifically situated in Juba City, South Sudan.

Objective of the Study

The general study objective was to determine the impact of Information Communication Technology on project completion in Small and Medium Enterprises, In Juba County, South Sudan.

The specific objectives were;

1. To determine the extent to which digital communication tools influence project completion in Small and Medium Enterprises in Juba County, South Sudan.
2. To establish the extent to which automated document management systems influence project completion in Small and Medium Enterprises in Juba County, South Sudan.
3. To determine the influence of project management System on project completion in Small and Medium Enterprises in Juba County, South Sudan.

Research Question

1. How does digital communication tools influence project completion in Small and Medium Enterprises in Juba County, South Sudan?
2. What extent does automate document management system influence project completion in Small and Medium Enterprises in Juba County, South Sudan?

3. How does project management System influence project completion in Small and Medium Enterprises in Juba County, South Sudan?

II. Literature Review

In this chapter, the theories which are relevant to the study are discussed. The theories include the diffusion theory and the Technological Acceptance Model (TAM) and are further detailed below.

Diffusion Theory

This theory was pioneered by Rogers (1983). It views the dissemination of innovation as being governed by the way potential adopters behave when faced with uncertainty during the introduction of technical breakthroughs. Although innovations provide novel methods for resolving issues, the adoption process is hampered by ambiguity about whether the new approaches will be superior to those now in use. Potential adopters are compelled to seek out more information to allay this concern, especially from their co-workers (Niederman, Brancheau & Wetherbe, 1991). Many inventions take a while to spread from the time they are first made available until they are really adopted; this is a typical issue that both individuals and organizations face (Rogers, 1983).

According to Sahin (2006) there are four factors which affects the new technologies adoption and they are, relative advantage, compatibility, and complexity and trial ability. In addition, Moore and Benbasat (1991) state that image and visibility are in addition important aspects of innovation.

Business decides to finance in Project Management System (PMS) for a variety of reasons. These reasons include making the project managers work more efficient and easier, giving chance to help in planning, controlling project budgets, tracking activities, and monitoring project schedules are some of the reasons (Marti & O'Brien, 2005). According to Davis (1989), the advantages of adopting IT may be damaged by consumers' unwillingness to adopt and employ novel technologies that they have been offered. The benefits of a project management system will solely be realized if the expected users use the systems in a manner that allows for effective project completion and thereby contributes to the organization's strategic and operational goals. The first research objective is addressed by the innovation diffusion hypothesis, which examined to what extent the usage of PMS in project management influences project completion.

Technological Acceptance Model (TAM)

This theory was founded by Davis (1989). As indicated in this theory, consumers' acceptance of a technology is determined by their anticipated gain (perceived usefulness and perceived ease of work) from using the technology. Owing to the already founded association amongst technology acceptance and organization performance, the study of technology acceptance or ICT has been at the forefront of the research agenda from the inception of the TAM (Goodhue & Thompson, 1995; Davis, Bagozzi & Warshaw, 1992).

Despite TAM's widespread implementation verified the theory's robustness (on average it explained about 40% of the changes in technology acceptance), the model's developers still wished to increase the model's predictive power even more. The reason for expanding the model was a lack of understanding of the conditions behind consumers' perceptions of technology usage. The biggest predictor of aim to use was revealed to be perceived usefulness, with an average impact size of 0.6 (Venkatesh & Davis, 2000). Nevertheless, there was slight research on the factors that influence people's judgements of the value of technology. Additionally, to demonstrating how users' perceptions of utility and usability affect intention (e.g., Venkatesh & Davis, 1996), study into the factors that drive usefulness perception was necessary to offer guidance on system creation. Davis and Venkatesh (2000) research of important factors influencing perceived usefulness aimed to create a thorough framework for understanding and predicting organizational settings' adoption of new technologies.

In project management, the perceived usefulness and ease of a technology or rather ICT influence the adoption of the technology by the SMEs. If they perceive a technology to be usefulness, they will adopt it. Hence this theory is applicable to this study since if ICT is found to have an influence in the project completion, SMES will seem to adopt it.

III. Methodology

This study used a quantitative approach and adopted a descriptive research design. The study targeted population was 13,348 licensed SMEs within Juba city of South Sudan were the target population (World Bank,2019). The data was collected through the application of questionnaires. The research instrument validity and reliability was established using the Cronbach Alpa reliability test which produced a coefficient of 0.769 showing that the data was reliable. The data was analyzed through use of the SPSS version 23, and descriptive statistics were shown as percentages, means, and frequencies. Regression analysis and correlation analysis was used to determine the strength and direction of relationship of information communication technology on the project completion of SMEs in Juba South Sudan.

IV. Results

The data collected was analyzed for both descriptive statistics and inferential statistics and the outcomes are shown in the following subsections.

Response Rate

The respondents were given a total of 96 questionnaires. 50 SMES answered to the administered questionnaires, representing a 52% response rate. This response rate conforms with Kumar (2015), who believes that a response rate of more than 50% is sufficient to continue with academic research.

Table 1: Response Rate

Research instruments	Sample size	Percentage (%)
Returned	50	52
Not Returned	46	48
Total	96	100

Source: Research Findings (2023)

Descriptive Statistics

The responses for the independent variables digital communication tools, automated document management systems and project management system were analyzed for mean and standard deviation.

Table 2: Digital Communication tools and project completion

Statement	N	Mean	Std. Deviation
Digital communication tools facilitated effective collaboration among team members throughout the project completion process	50	3.82	1.101
digital communication tools were used to streamline project communication and decision-making	50	3.60	1.178
The quality of project outcomes was improved as a result of using digital communication tools.	50	3.80	1.229
Digital communication tools allowed for timely and efficient communication throughout the project completion process.	50	3.92	1.175
Overall, the success of the project completion process was positively impacted by the use of digital communication tools.	50	3.94	1.219
Composite Mean and Std. Deviation		3.82	1.180

Source: Research Findings (2023)

The findings reveal that on average the respondents indicated that digital communication tools have a positive influence on project collaboration, communication and ultimately on the project success as indicated by the composite mean of 3.82. More precisely, the respondents on the statement that digital communication tool enabled timely and efficient collaboration amongst team members throughout the project completion process, this statement recorded a mean of 3.92 which is above the composite mean of 3.82. This displays that most of respondents agreed that the tools facilitate effective and timely communication amongst the project team member during project implementation. Conversely, the statement that the use of digital communication tools helped streamline project communication and decision-making received a mean rating of 3.60, indicating a slightly lower level of agreement compared to other statements. However, it is essential to note that the variation in responses was relatively small, as exhibited by the composite standard deviation of 1.180. Furthermore, the standard deviations for each statement ranged from 1.101 to 1.229, suggesting moderate variability in respondents' perceptions for each item. The statement with the lowest standard deviation, Digital communication tools facilitated effective collaboration among team members throughout the project completion process (Std. Deviation = 1.101), indicates a higher level of agreement among respondents regarding its positive impact on collaboration. In contrast, the statement the quality of project outcomes was improved as a result of using digital communication tools displayed the highest standard deviation (1.229), implying more diverse opinions among respondents on the extent to which these tools influence project outcomes. In summary, the data indicates an overall positive impact of digital communication tools on project completion. These findings are in line with those of Nyandongo and Davids (2017) the findings showed a significant positive relationship between communication methods and project outcomes. Further, Effective communication was linked to higher success rates and overall project performance

Table 3: Descriptive Statistics on automated document management system

Statement	N	Mean	Std. Deviation
The automated document management system facilitated efficient document sharing among team members throughout the project completion process.	50	3.86	1.050
The use of the automated document management system helped ensure that team members had access to the most up-to-date project documents.	50	3.82	1.207

The quality of project outcomes was improved as a result of using the automated document management system.	50	3.64	1.156
The automated document management system allowed for better organization and management of project documents throughout the completion process	50	3.96	1.177
Overall, the automated document management system's utilisation contributed to the project's successful conclusion.	50	4.04	1.106
Composite Mean and Std. Deviation		3.86	1.139

Source: Research Findings (2023)

The findings suggest that, on average, respondents had an agreement that automated document management system's impact on various aspects of project completion as exhibited by a mean of 3.86 and a standard deviation of 1.139. On the statement that document management system increase document sharing amongst team members, many of the respondents agreed as indicated by mean of 3.86 and the variability in responses was low as indicated by the standard deviation of 1.05. Additionally, most of the respondents also agreed that automated document management system helped the team member keep up to date project document. The respondents on the statement that quality of project outcomes was improve due to use of automated document management system received an agreement level from most of the respondents given the mean of 3.64 and standard deviation of 1.156. Most of respondents agreed with the statement that automated document management systems allowed for better organization and management of project documents throughout the project completion process as indicated by a mean of 3.96 above the composite mean of 3.86. On overall there was agreement with the most respondents agreeing that use of automated document management systems positively impacted the success of the project completion processes as shown by the mean of 4.404 above the composite mean of 3.86 This finding henceforth implies that automated document management systems have a positive influence on the project completion in SMEs in Juba County, South Sudan.

Table 4 Descriptive Statistics on project management system

Statement	N	Mean	Std. Deviation
The project management System facilitated effective project planning and scheduling throughout the completion process.	50	4.00	1.107
The use of the project management System helped ensure that project tasks were completed on time and within budget.	50	4.06	1.058
The quality of project outcomes was improved as a result of using the project management System.	50	3.96	1.087
The project management System allowed for better collaboration and communication among team members throughout the project completion process.	50	4.06	.978
Overall, the use of the project management System positively impacted the success of the project completion process.	50	4.12	1.023
Composite Mean and Std. Deviation		4.04	1.050

Source: Research Findings (2023)

From the findings above, on average, there is a high agreement with the influence of PMS on project completion as indicated by the mean of 4.404. On the statement that project management System facilitated effective project planning and scheduling through the completion process most of the respondents agreed as exhibited by a mean of 4.00. Most of the respondents also agreed that project management System has helped them ensure project task are completed on time and within the budget as recorded by mean of 4.06. On the second statement that the quality of project outcomes was improved as a result of using the project management System received a mean rating of 3.96. Although still positive, this statement received a slightly lower mean rating compared to the previous ones, suggesting that respondents were somewhat less certain about the direct impact of the System on project outcomes. On the statement that project management System allowed for better collaboration and communication among team members throughout the project completion process recorded a mean rating of 4.06 was recorded indicating that respondents agreed with the System's efficacy in promoting collaboration and communication among team members during the project. On the final statement that on overall, the use of the project management System positively impacted the project completion process recorded the highest mean rating of 4.12 suggesting that, on average, strongly agreed that the System had a significant positive influence on the overall success of the project completion process. The composite mean of 4.04 indicates an overall highly positive perception across all statements, with respondents expressing a general agreement with the project management systems having a positive influence on the project success of SMEs in Juba County, South Sudan

Inferential Statistics Results

The study aimed on determining the variation amongst the independent variables and dependent variables, the project completion of SMEs in Juba County South Sudan, as indicated in table 5 using Analysis of Variance (ANOVA).

Table 5: Analysis of variance (ANOVA)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.271	3	17.757	839.933	.000 ^b
	Residual	.972	46	.021		
	Total	54.243	49			
a. Dependent Variable: Project Completion						
b. Predictors: (Constant), Project management Software, Automated Document management software, Digital Communication Tools						

Source: Research Findings (2023)

Results of Analysis of Variance

The ANOVA findings in Table 5 above displays that the regression model as a whole is highly significant (p-value < 0.001), implying that the predictors variables combined have a strong relationship with the dependent variable Project Completion. In addition, the ANOVA analysis indicates that project management system, automated document management system and digital communication tools collectively explain to a significant amount the changes in project completion. The F-statistic is quite large, further supporting the strong statistical significance of the model.

Table 6: Correlational Matrix

		Digital Communication Tools	Automated Document management system	Project management Software	Project Completion
Digital Communication Tools	Pearson Correlation	1	-.082	.976**	.983**
	Sig. (2-tailed)		.574	.000	.000
	N	50	50	50	50
Automated Document management system	Pearson Correlation	-.082	1	-.033	-.019
	Sig. (2-tailed)	.574		.819	.894
	N	50	50	50	50
Project management Software	Pearson Correlation	.976**	-.033	1	.986**
	Sig. (2-tailed)	.000	.819		.000
	N	50	50	50	50
Project Completion	Pearson Correlation	.983**	-.019	.986**	1
	Sig. (2-tailed)	.000	.894	.000	
	N	50	50	50	50
**Correlation is significant at the 0.01 level(2-tailed).					

Source: Research Findings (2023)

The results in table 6 above indicates that there is a strong positive correlation between the use of Digital Communication Tools and Project Completion (r = 0.983, p < 0.01). This implies that as the utilization of digital communication tools increases, there is a corresponding increment in the success of project completion. These results concur with those of Afridi, Turi, Zaufishan, and Rosak-Szyrocka (2023) whose indicated that user behavior toward digital communication tools is favorable; digital communication tools have an impact on project performance; and the simplicity of using significantly moderates the relationship between digital communication tools and project performance in comparison to top management support. On Automated Document Management Software, the outcomes showed that there is no significant correlation between the use of Automated Document Management Software and Project Completion (r = -0.019, p > 0.05). This suggests that the implementation of the automated document management software may not have a strong association with the success of project completion. The findings neither agrees on disagrees from the reviewed literatures that opines that ineffective document management issues can led to lost productivity, lost business and reduced morale amongst employees in organizations (Seiwald,2013). Heckman (2008) states that for medium and large organizations with tens or hundreds of thousands of documents, using a DMS is an absolute necessity. In that view DMS has a positive contribution towards the successful project completion. On Project Management Software the results show that there is a strong positive correlation between the use of Project Management Software and Project Completion (r = 0.986, p < 0.01). This suggests that as the adoption of project management Software increases, there is a corresponding increase in the success of project completion. This finding agrees with those of Ogero (2014) who conducted a study aimed on investigating influence that project management information system has on project performance in construction firms in Nairobi county and revealed that project management information system had a strong and positive correlation with project performance. The research further revealed that using a system enables generation of quality information required by users, project managers in performing their tasks enabling them to performance in a more professional method and increasing performance. Overall, the results indicate that

two independent variables, Digital Communication Tools and Project Management Software, are significantly positively correlated with the dependent variable, Project Completion. This suggests that leveraging digital communication tools and utilizing

V. Conclusion

From the findings, digital communication tools were revealed to have a positive impact on project collaboration, communication and ultimately on the project success as indicated by the composite mean of 3.82. Further correlation analysis found out that digital communication tools was strongly and positively correlated with project completion of SMEs in Juba County South Sudan given the 0.983 correlation coefficients. Regression analysis further presented that there was a positive association of digital communication tool and project completion where an increment in digital communication tools with a unit will lead to an increment in project completion with 0.421 unit. The researcher therefore based on these findings concluded that digital communication tools have a strong positive and notable association with project completion in SMEs in Juba County, South Sudan. This implies that digital communication tools are key for project completion to be a success and increase in use of digital communication tools lead to increase in successful project completion.

The research findings further indicated that automated document management systems have a positive but insignificant influence on project completion as exhibited by a mean of 3.86. Further the findings revealed that automated document management system, has no significant correlation between the use of with Project Completion ($r = -0.019$, $p > 0.05$). Additional regression analysis found that, increment in automated document management systems in a unit will lead to an increment in project completion with 0.111. The researcher therefore based on these findings concluded that automated document management systems has an insignificant influence on the project completion of SMEs in Juba County South Sudan. This therefore implies that use of automated document management system might not have a significant influence on the project completion of SMEs in Juba County, South Sudan.

Further findings on project management System revealed most of the respondents were in consensus that project management System has a positive influence on project completions as indicated by the mean of 4.404. A strong positive and significant correlation was established between project management System with Project Completion ($r = 0.986$, $p < 0.01$). Regression analysis further revealed that an increment in project management system with unit will lead to an increase in project completion with 0.554 unit. A conclusion based on these findings was that project management System has a positive and significant relationship with project completion of SMEs in Juba County South Sudan. This implies that use of project management System is of great impact for the project completion to be a success.

VI. Recommendations

From the findings, digital communication tools were revealed to have a positive influence on project collaboration, communication and ultimately on the project success. This research therefore recommend that manager and owners of SMEs should encourage and promote the use of digital communication tools within SMEs. These tools have been shown to positively influence project collaboration and communication, leading to increased project success. The staff and owners of the SMEs ought to get the necessary training on the communication tools so that to effectively use them so as to attain project success.

The research findings further indicated that automated document management software have a positive but insignificant influence on project completion. This therefore recommends that SMEs management should consider investing in and adopting robust project management Software. This can streamline project workflows, enhance team coordination, and improve overall project efficiency. Automated document management system enables generation of quality information required by users, project managers in performing their tasks enabling them to performance in a more professional manner and increasing performance.

The third recommendation of this study is that management and other stakeholders should adopt using project management software as it has been found to have a positive influence on project completion. It offers tools for planning, scheduling, collaboration, and tracking progress—all of which contribute to increased efficiency. Plus, the ability to manage resources effectively often leads to cost reduction, which is a win-win for any project. Adopting such software can streamline workflows and enhance communication among team members and stakeholders, ultimately contributing to successful project completion.

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