



Received: 09-12-2025
Accepted: 19-01-2026

ISSN: 2583-049X

An Examination of Project Software Utilization on Project Completion: Case Study of Smart Zambia

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DOI: <https://doi.org/10.62225/2583049X.2026.6.1.5702>

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Abstract

Project management is a complex undertaking that requires proper planning and management. The study aimed at examining of project software utilization on project completion and it was informed by the following specific objectives: To establish the types of project software used at Smart Zambia, to examine effectiveness of project software for project completion, to ascertain the relationship between effective use project software and project completion and, to identify limitation faced by smart Zambia in the utilization of project software. The study adopted a descriptive case study and targeted staff from smart Zambia these are individuals involved in project management. A sample size of 50 respondents who were samples using purposive sampling were. Collected data from questionnaires were analysed using SPSS version 20 while data collected using interview guide where analysed thematically by grouping similar responses into themes and reporting them as statements. The study has revealed that project software helps the project to be completed on time and accordingly, the study has established that software enhances project completeness, performance and success. The findings have

also revealed that project software training improves competency for project managers and this enhances project success. Training in project software has the capacity to influence the management of quality and cost of the project. Further, the study looked at the limitations that are associated with project software and the among the highlighted limitations were having limited technical skills, technical difficulties and lack of training for new team member, initial resistance from staff unfamiliar with the technology and, inadequate training for staff and high costs of implementation. In line with the findings of this study, it can be concluded that project software influences project performance by enhanced quality, effective cost management as well as project completeness, reduces project cost and promotes time management. The study finally recommended that there is need for companies to conduct regular training for the team so as to enhance the effectiveness of project software on project performance. This can be coupled with enhanced clear communication about usage of the software and by ensuring constituting a dedicated IT support team.

Keywords: Examine, Project, Software, Utilization, Project Completion

1. Introduction

1.1 Background

In the 1990s, software development faced a bit of a crisis (Varhol, 2015). Referred to as ‘the application development crisis’ or ‘application delivery lag’, the industry realized that it couldn’t move fast enough to meet customer demands and requirements, the estimated time between a business need and actual application was about three years (Muslihat, 2018). According to Muslihat (2018), traditional development models were based on a timeline approach, where development happened sequentially and the final product was not revealed to customers until the very final step, which left little room for flexibility when it came to progress reviews and changes. So, by the time an actual application was finished, it was highly likely that requirements and systems of the project’s original objectives had changed (Tripathi & Goyal, 2014).

When the software development community realised that a lot of time, effort and money was being wasted and some projects failures encountered, they thought of changing approaches away from the traditional approach (Varhol, 2015). Then in 2001, a group of industry practitioners gathered to discuss industry practices (Brush, 2019). Though the meeting was set up with a

primary focus on the discussion of development cycles, some participants were already entertaining the idea of a new software development method (Mimbs N. 2017). They all yearned to cement a process that legitimized what was being practised, and so, came the creation of the Agile Manifesto (Mimbs N. 2017).

Choosing and adaptation of the methodology depends on project types, company and its employees (Rasnacis, Arturs & Bērziša, Solvita, 2017) employee characteristics, their mutual relations and motivation is one of aspects that can seriously impact success of the methodology implementation. So, these factors also need to be evaluated and considered during the adaptation of methodology (Rasnacis & Solvita, 2017).

There is a perception among specialists that information technology projects fail regularly. Only 39% of software projects are completed on time and on budget (The Standish Group, 2013). Even worst, when considering different points of view from researchers, practitioners and academics perspectives (Al-Ahmad *et al.*, 2009) there is still no single measure of software project success (Shenhar & Dvir, 2007). Even when a project is considerate well-done, there are still many reports of challenges and efforts to overcome them (Al-Ahmad *et al.*, 2009). Most of the project issues are related to the human aspects: behavioural, organizational or managerial aspects (Hartman & Ashrafi, 2002). Embracing all these aspects, the communication process is accountable for many issues, including both its inputs and outputs (Lu, Liu and Liu, 2009) and including the informal communication process.

1.1 Problem statement

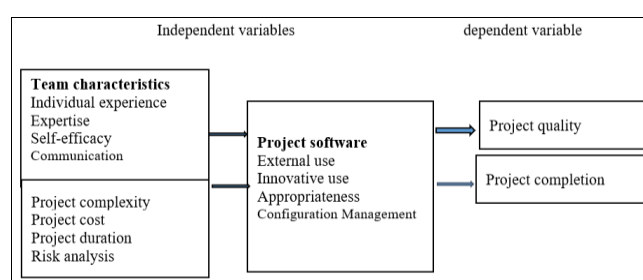
Achieving high effectiveness in project management helps to ensure a successful outcome from the project. Currently, the software engineering body of knowledge lacks adequate tools that will help to quantify the project management effectiveness in software projects (Natasha, 2022) ^[12]. Activant (2022) points out that there are essential and accidental difficulties of software engineering. Bhardwaj, Rana, and Sharma (2019) stressed that the sophistication of Project Management software usage is very high, with 80% of PM professionals using it for both planning and control. According to Rose and Jotham (2020) ^[13] usage of PM software has been adopted with the advent of the personal computer, and has reached 90%–95% of Project Management professionals using the software at different levels of project management. Currently, the software engineering field lacks a well-founded software project management metric. Such a metric could enable software project managers to measure the project management effectiveness, identify problematic areas during projects, identify challenged areas in completed projects (e.g., postmortem analysis), and shed light on forthcoming ones (The Standish Group, 2017). With regards the implementation e-Government, limitations such as lack of integration and data sharing mechanisms; uncoordinated ICT Project among public institutions, weak institutional arrangement and legal frameworks; inadequate software skills; poor talent management; inadequate funding for ICTs; Inadequate ICT infrastructure in government; and lack of standards and procedures. It is therefore significant to examine the effectiveness of project software on project performance.

1.2 Objectives

1. To establish the types of project software used by Smart Zambia
 2. To examine effectiveness of project software for project completion
 3. To ascertain the relationship between effective use project software and project completion
- To identify the limitation faced by Smart Zambia in utilisation of project software

1.3 Conceptual Framework

This conceptual framework is based on the project software. The framework also assumes that if project software is implemented well it may improve project quality, project efficiency as well as project completion. When the above aspect become part of the project, project success is realized. The relationship between independent and dependent variables is summarized in the figure below.



Source: Author, 2025

Fig 1: Conceptual framework

2. Literature review

A vast amount of project management software is available today in a wide variety of capabilities, applicability, platform requirements, and prices. These software products significantly enhance the PM's job of managing a project in almost all aspects, including selection, planning, scheduling, execution, control, risk, and communications. PMs should therefore be aware of the types of tools available and the features and applicability of those tools. Spreadsheet programs are the most commonly used computer software programs for project management (and business in general). Spreadsheets are easy to learn, easy to use, inexpensive, generally available, and adaptable to most project management tasks Serra (2015) ^[16].

Studies by Heeks (2016) ^[6] suggest that project management software are digital tools used to help plan, track, and execute projects by organizing tasks, managing resources, and facilitating collaboration. Popular options include Asana, Trello, [Monday.com](https://monday.com/), and Jira, each with strengths like visual organization (Trello), comprehensive task management (Asana), automation (Monday.com), and developer focus (Jira). Many offer free plans or trials, with a wide range of paid plans available depending on team size and feature needs.

Smartc Zambia uses the following project software: ERP Software Suite; SMARTCare Pro; Wirepick Zambia's solutions, Smartsheet and Digital Zambia Acceleration Project (DZAP)

A project implemented by the Smart Zambia Institute, aiming to enhance digital service delivery and accelerate Zambia's digital transformation. Focuses on affordable broadband, interoperable data platforms, high-impact digital

services, and program management.

According to Kundu *et al.* (2020) [8] project management software is a term covering vast types of software, including estimation and planning, scheduling, cost control and budget management, resource allocation, collaboration software, communication, quality management and documentation or administration systems, which are used to deal with the complexity and different aspects of large projects. Since the project management is one of the core functions of a business organization, the project management function should be supported by software. Before software was born, project management was fully done through papers. This eventually produced a lot of paper documents and searching through them for information which was not a pleasant experience. Once software came available for an affordable cost for the business organizations, software development companies started developing project management software. Kimmons (2019) conducted a study on the limitations and benefits of project software in constructions. His study revealed a number benefits as well as limitations of project software. He explained that early days of project management software was limited to the use in big mainframe computers and was used only in large projects. They had their own limitation in their capabilities and were also difficult to use. It could do the basic fundamentals of project management like planning, monitoring, controlling the project but as time and technology changed, the software got better. The larger and more complex the project, the greater will be the accrued benefits. These computers aided project management tools are capable of processing the large amount of information; they are capable of adjusting quickly to the changing project plans even at the execution phase. They are programmed so that they are capable of generating status reports for various levels of management and also providing possible alternative scenarios.

3. Methodology

This study adopted a case study design. The study also used quantitative approach. The mixed method approached has been preferred in order to take advantage of the differences between the two methods. Qualitative approach attempts to study the everyday life of different groups of people and communities in their natural settings.

This study utilized a purposive sampling techniques to select respondents from Smart Zambia, ensuring both representativeness and depth of data. Purposive sampling was employed to select members of respondents.

The target population includes Project Managers and software engineers. A sample size of 50 respondents was picked which comprised Project Managers and software engineers. And questionnaires were used as tools for data collection.

Collected data were analyzed using SPSS and Excel was used to generate figures.

4. Results

a. Figure 1: Highest Number of Project Teams Managed

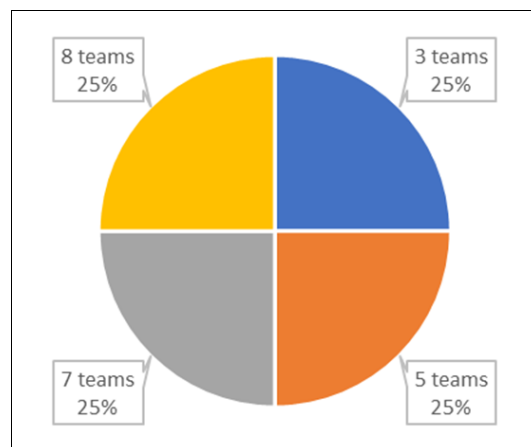


Fig 1: Highest Number of Project Teams Managed

With regards the number of project teams managed, 15% of participants said they have 3 teams, 25% stated that they have managed 5 teams while 20% said they managed 7 teams and the rest representing 40% indicated that they have managed about 8 teams.

b. Figure 2: Project software used by the company

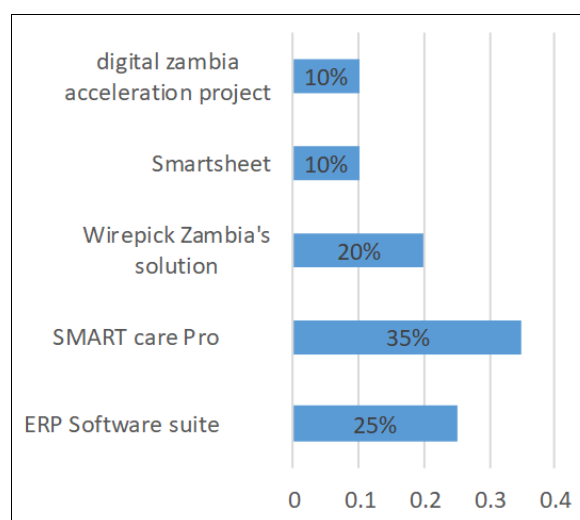


Fig 2: Project software used by the company

During data collection, respondents were asked to indicate the software which they have been using, 25% said they use ERP suite, 35% indicated that they use SMART care Pro, 20% stated that they use Wirepick Zambia's solution, 10% have been using Smartsheet and the rest Digital Zambia acceleration project.

c. Figure 3: Areas of project management in which project software is applied

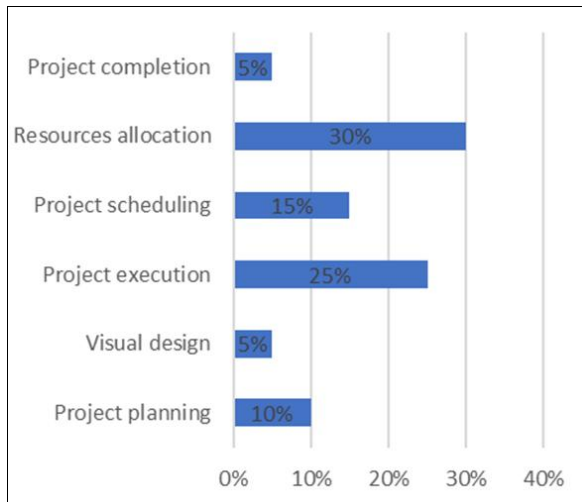


Fig 3: Areas of project management in which project software is applied

Concerning the area where project software is applied, 10% said they use it in project planning, 5% indicated that they use visual design, 25% stated that they use project software in project execution, 15% said they have implemented project scheduling, 30% use project software in resources allocation and the rest representing 5% stated that the software is used for project completion.

d) Figure 4: Extent to which project software affect project completion

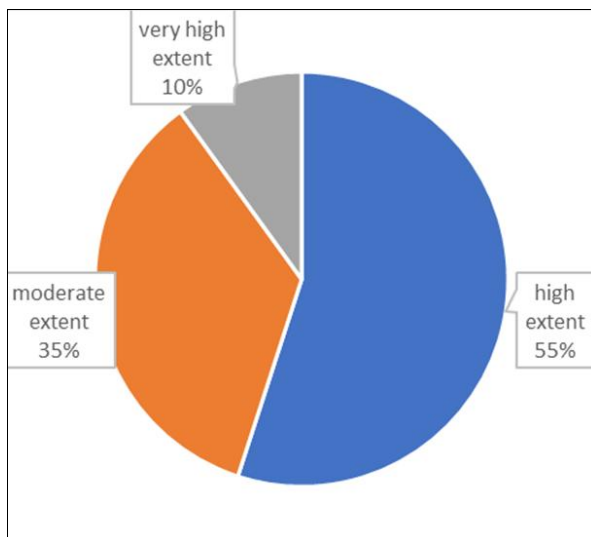


Fig 4: Extent to which project software affect project completion

With regards the extent to which project software affect project completion, 55% indicated that the extent is high while 35% stated that the extent is moderate and the rest 10% stated that the extent is very high. This means that the completion is influenced by project software.

e) Figure 5: Effectiveness of project software on project completion

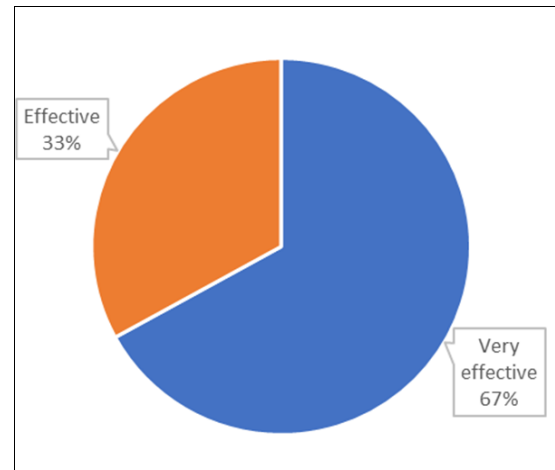


Fig 5: Effectiveness of project software on project completion

During the study, participants were asked to state the effectiveness of project software in enhancing project completeness and 67% stated that project software is very effective while 33% said it is effective.

f) Figure 6: Stage of the project at which project software enhanced project completion

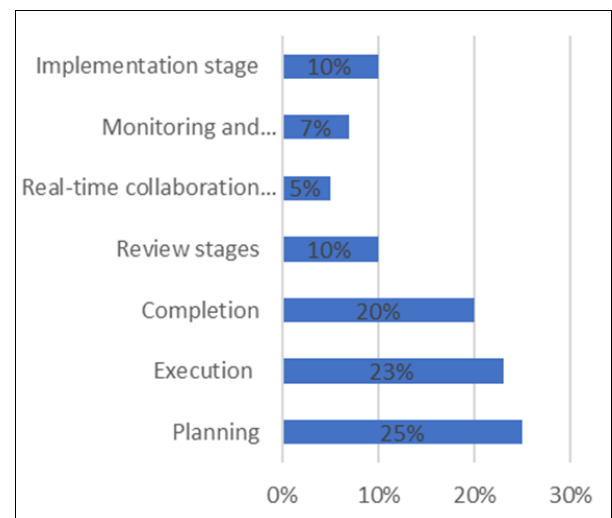


Fig 6: Stage of the project at which project software enhanced project completion

Participants were asked to state the stage of the project were project software are used and 25% indicated that project software is used during project planning, 23% said software is used to execute the projects, 20% indicated that project software is used during project completion, 10% indicated that they use them at review stages while 5% indicated that it is used for real-time collaboration and feedback while 7% indicated that project software is used to Monitor and adjusting quality standards as way of enhancing project performance and 10% said during implementation process.

g) Figure 7: Factors that influence successful project software implementation

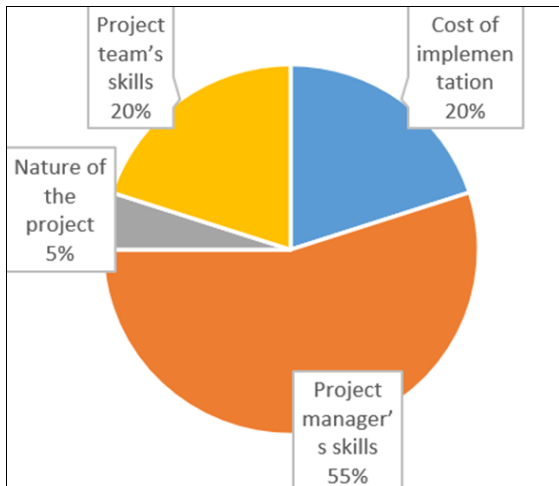


Fig 7: Factors that influence successful project software implementation

With regards the factors that influence success of project software implementation, 20% stated that the cost of implementation has an influence on the success of project software implementation, 55% said the skills of the project manager influences the implementation of the software while 5% mentioned nature of the project and the rest representing 20% stated that the skills of project team.

h) Figure 8: Extent to which project software affect project completion

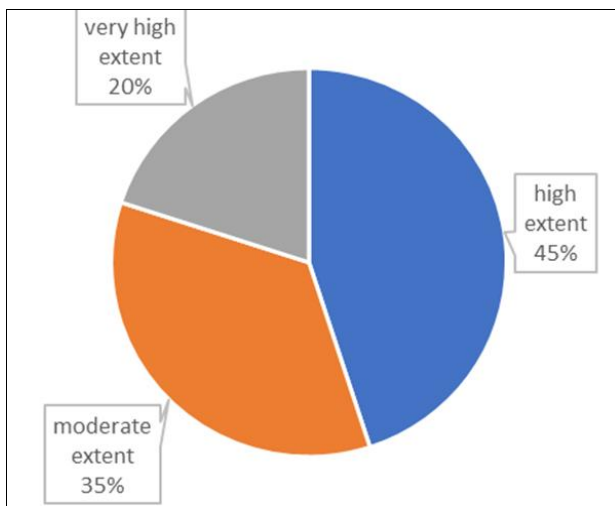


Fig 8: Extent to which project software affect project completion

Participants were asked to state the extent to which project software influence the *completion* of the project and on this one 45% stated that the extent is very high, 35% said the extent is moderate and the rest representing 20% said the extent is very high.

i) Figure 9: Effectiveness of project software on project completion

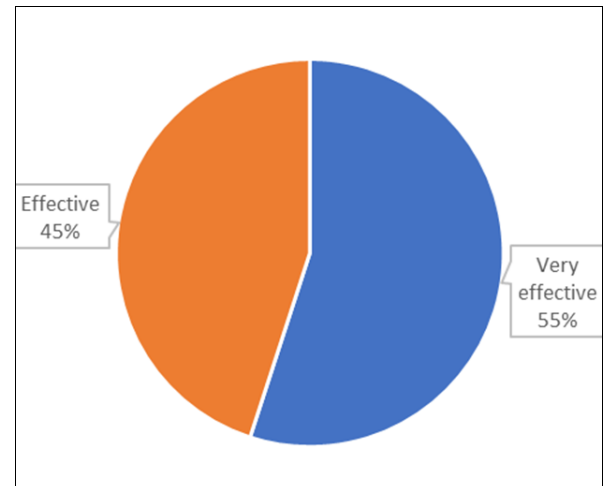


Fig 9: Effectiveness of project software on project completion

With regards the effectiveness of project software in enhancing project performance, 55% said project software is very effective while 45% indicated that project software is effective in enhancing project performance.

j) Figure 10: Stage of the project at which project software training improve project completion

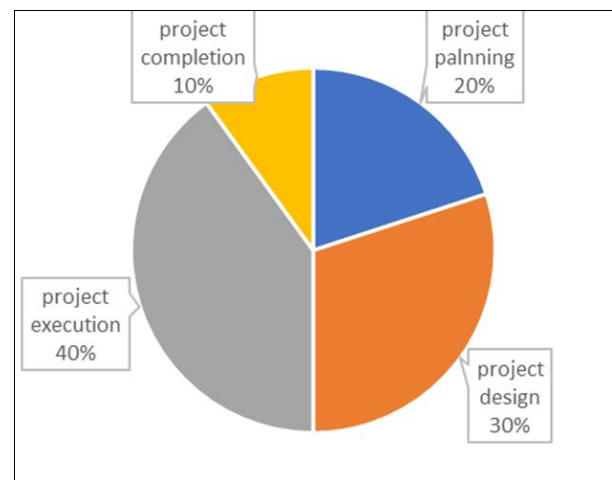


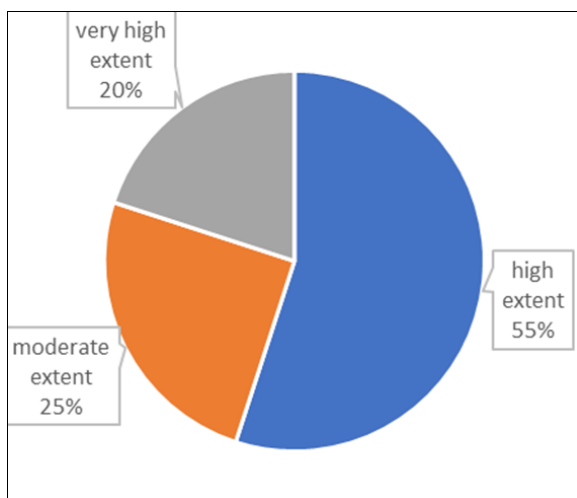
Fig 10: Stage of the project at which project software training improve project completion

Concerning the stage at which project software training enhances effective management of project, 40% said project software training enhances project execution, 20% indicated that it enhances planning, 10% stated that project software training enhances project completion and the rest 30% said it enhances project designing.

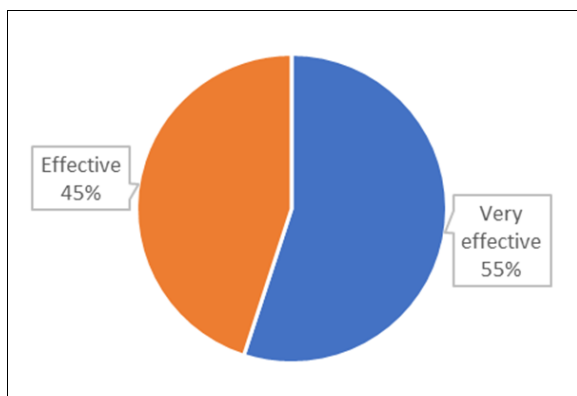
k) Table 1: Effects of training on project completion

Effects of project software	%
Training enhances individual competency	25%
Training reduces the cost of projects	20%
Reduced the duration of projects	15%
Training enhances quality of the projects	23%
It promotes customer satisfaction	17%

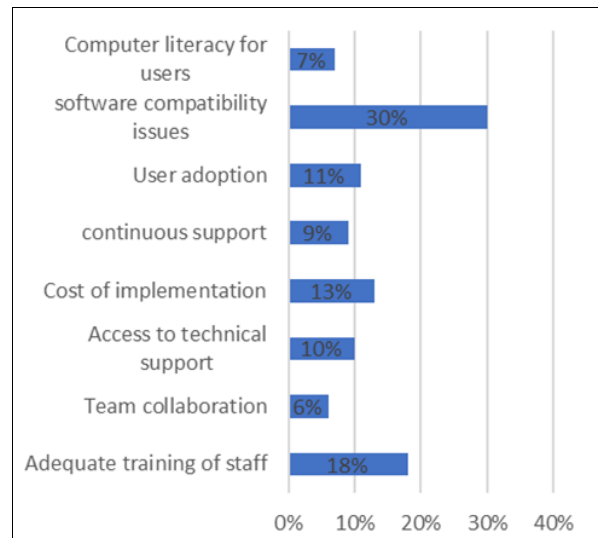
With regards the effects that training has on project performance, 15% indicated that training enhances individual competency, 20% indicated that Training reduces the cost of projects, 15% said training has the capacity to reduce the duration of projects, 23% revealed that training enhances quality of the projects and the rest 17% said it promotes customer satisfaction.

l) Figure 11: Extent to which project software training affect project completion**Fig 11:** Extent to which project software training affect project completion

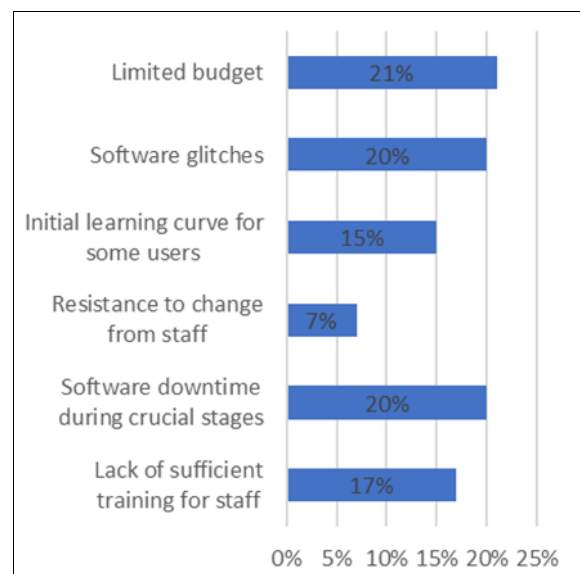
Respondents were asked to state the extent to which project software training influence project completion, 55% indicated that the extent is high while 25% said the extent to which project software training influences project cost is moderate and the rest representing 20% stated that the extent is very high.

m) Figure 12: Effectiveness of project software training in enhancing project completion**Fig 12:** Effectiveness of project software training in enhancing project completion

With regards the effectiveness of project software in reducing project cost, 55% said project software is very effective while 45% indicated that project software is effective in reducing project cost.

n) Figure 13: Factors influencing successful implementation of project software**Fig 13:** Factors influencing successful implementation of project software

With regards the factors that influence successful implementation of project software, 30% of participants indicated that software compatibility with the project is very important, 18% stated that adequate training of staff influence the successful use of project software, 13% mentioned cost of implementation, 11% said user adoption is key, 10% indicated that access to technical support, 9% said continuous support while the rest representing 6% mentioned team collaboration and the rest 10% mentioned computer literacy level for software users.

o) Figure 14: Challenges faced when implementing project software in project management**Fig 14:** Challenges faced when implementing project software in project management

Some of the weaknesses the Master Plan intends to address includes: lack of integration and data sharing mechanisms; Uncoordinated ICT Project among public institutions; weak institutional arrangement and legal frameworks; inadequate ICT skills; poor talent management; inadequate funding for ICTs; Inadequate ICT infrastructure in government; and lack of standards and procedures Project software has benefits that are realised when successfully implemented, however, it has its own challenges and according to the participants 17% indicated that software glitches affect its implementation, 21% mention limited resources, the other 20% said Software downtime during crucial stages negatives affect its usefulness, 17% mentioned lack of sufficient support from other staff while 15% indicated that Lack of sufficient training for staff is one of the crucial challenges and the rest 7% indicated that Resistance to change from staff is a draw back.

p) Figure 15: Means of enhancing successful implementation of project software in project management

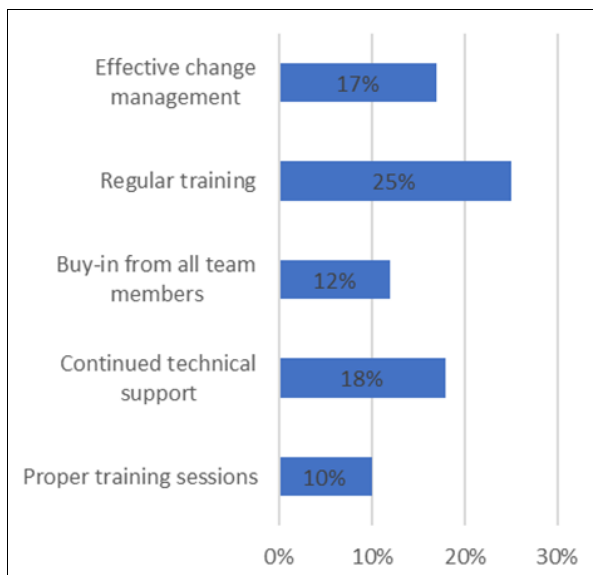


Fig 15: Means of enhancing successful implementation of project software in project management

In order to successfully implement project software, the following strategies were proposed by participants, 18% said there should be regular update of the software, 25% stated that regular training of staff, other 18% mentioned continuous support as a way of enhancing the usefulness of the software, 17% advocated to effective change management, 12% instated that buy-in from the team members is key and the rest representing 10% said proper training sessions are needed in order to acquaint team members and other staff with the software.

5. Discussion

Project management software (PMS) are computer based applications designed to assist and help plan, organize, or manage resource tools as well as to develop resource estimates. Based on the specification of the software, it can manage estimation and planning, scheduling, cost control and budget management, resource allocation, collaboration software, communication, decision-making, quality management, time management and documentation or

administration systems. The study has revealed that project software has the capacity to enhance project completeness and the extent to which project software influences project management is high.

The study by Mkila (2018) revealed that project Software (Tool) helps project team and managers to plan and execute the project to its completeness. He further said it is a computer software application specifically designed to aid the project management team with planning, monitoring, and controlling the project, including: cost estimating, scheduling, communication, collaboration, configuration management, document control, records management, and risk analysis. Efficient project management presupposes more than good planning, as it requires that relevant information be obtained, analyzed, and reviewed in a timely manner.

Quality Management is an important element of an organization's overall project management system. Quality Assurance includes both the organization focus (continuous process improvement) and the project focus (management of the project and the products and services that are produced). Quality Assurance continues throughout the full project life cycle, starting when the project is first proposed, and continuing through project execution and closeout. The application of project software in project management has come with great importance for it brings enhanced project performance.

Participants were asked to state the extent to which project software influence the quality of the project performance and on this one 45% stated that the extent is very high, 35% said the extent is moderate and the rest representing 20% said the extent is very high. This means that project software has enhanced project performance to a high extent and it has been discovered that project software is effective in enhancing the quality of projects. This can be seen as 55% said project software is very effective and 45% indicated that project software is effective in enhancing project quality.

According to Saputra (2015) ^[14] a project success is measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction. Project management focuses on the ability to deliver the project's product in scope, time, cost and quality known as the traditional iron triangle. Project scheduling provides a detailed plan that represents how and when the project will deliver the products, services, and results. It has been revealed that project software enhances project quality and quality can only be realised when performance is enhanced. Patil (2022) stated that quality Management Process is a set of procedures that are followed to ensure that the deliverables produced by a team are "fit for purpose". The start of the Quality Management Process involves setting quality targets, which are agreed with the customer. Project teams are one the project software which enable project team and manager to enhance project quality through its application.

Project software is used in various stages of project amazement, most software training enhances skills acquisition which enables managers and the team at large to age the objectives of the project.

With regards the effects that training has on project performance, 15% indicated that training enhances individual competency, 20% indicated that Training reduces the cost of projects, 15% said training has the capacity to

reduce the duration of projects, 23% revealed that training enhances quality of the projects and the rest 17% said it promotes customer satisfaction. This means that when projects software trainings are provided, management of projects become very easy and successful. In this study, Respondents were asked to state the extent to which project software influence project cost, 55% indicated that the extent is high while 25% said the extent to which project software influences project cost is moderate and the rest representing 20% stated that the extent is very high. This shows that Microsoft teams has been helpful to reduce the cost of the project and the extent of its importance is high. Another area of interest was to examine the effectiveness of project software in enhancing the reduction of project cost thereby improving its performance. And the study has revealed that Microsoft teams is effective in reducing project cost and enhancing project performance.

According to Brodar (2017) [5] the existing project management software tools do provide support to the project manager and have several basic strengths: Planning calculation and re-calculation; Recording progress and feedback data; Comparison of the planned against the actual achievement and Re-calculation of the plan in relation to progress update. These reflect the strengths of data processing by computers applied to project planning. Given input data and modifications, the tool will rapidly calculate and then re-calculate the plan. This is the basis for 'what-if' calculations useful during project initiation and the processing of progress data. Project software helps project teams and project manager to estimate project cost thereby determining the cost project and taking necessary measures to reduce the cost where possible.

On practice, the project is a totality of an actions directed on the achievement of the goal to create some complicated system with specified characteristics of quality in limited deadlines and on limited quantity of resources. despite the benefits of using project software, there are equally challenges and the study revealed that common challenges associated with project software include limited resources, resistance from other staff, lack or limited support among others. Other limitation in the implementation of e-payslip project include: lack of integration and data sharing mechanisms; Uncoordinated ICT Project among public institutions, weak institutional arrangement and legal frameworks; inadequate ICT skills; poor talent management; inadequate funding for ICTs; Inadequate ICT infrastructure in government; and lack of standards and procedures, failure to generate monthly and timely electronic payslips.

Project software has benefits that are realised when successfully implemented, however, it has its own challenges and according to the participants 17% indicated that software glitches affect its implementation, 21% mention limited resources, the other 20% said Software downtime during crucial stages negatives affect its usefulness, 17% mentioned lack of sufficient support from other staff while 15% indicated that Lack of sufficient training for staff is one of the crucial challenges and the rest 7% indicated that Resistance to change from staff is a draw back.

According to the study by Alves (2019) the main problems of a software implementation in project management include: Unclear formulation of the task from customer; the common problem that is occurring; in implementation of software is to find out all the tasks and to realize the

solution. Such a problem can occur because of misunderstanding of work processes in corporation and all accompanying structures. Alves further said inconsistent or inadequate training pose a challenge during the implementation. He further said lack of a detailed, comprehensive training methodology can be a major setback for any software implementation project. Implementation can go awry or even stall altogether if clear goals and timelines are not laid out from the beginning. It is important to set up a plan that makes sense for your needs and resources and to ensure agreed-upon milestones are met along the way.

With regards the challenges or problems associated with the implementation of project software in planning, Abdallah (2021) mentioned Length of time as one of the problems and he explained that the average length of a typical software implementation process varies widely. For a robust, integrated solution like an Enterprise Resource Planning (ERP) system, the average implementation can last from 11 to 18 months. Financial and accounting, timekeeping and scheduling, human resources, payroll, inventory, compliance and equipment tracking, job costing and customer and employee self-service are just some of the functionality TEAM offers

Agarwal (2016) added that conducting business as usual while learning, training and migrating to a new system: Compounding the issues that go along with a lengthy implementation process is the fact that the company still has to conduct business as usual on a daily basis. Often due to a lack of funding, a lack of staff resources, or both, employees are asked to tend to the tasks of their core job and contribute to the software project. This practice can be detrimental to the effort, causing the implementation period to go on longer than initially planned.

5.1 Conclusion

Project management is a complex undertaking that requires proper planning and management. The study focused on the use of project software as a tool for enhanced project completion. The study focused on Smart Zambia and regarding the effectiveness of project software in enhancing project completeness, the study has revealed that project software helps the projects to be completed on time and accordingly. The findings have also revealed that project software have the capacity to influence completion and quality of a project. In this study it has been revealed that project software training enhances project completion because training enhances competency quality and reduces the cost of the project.

Further, the study looked at the limitations that are associated with project software utilisation and the challenges highlighted in this study include limited technical skills, technical difficulties and lack of training for new team member, initial resistance from staff unfamiliar with the technology and, inadequate training for staff, failure to generate monthly electronic payslips on time and high costs of implementation. In line with the findings of this study, it can be concluded that project software influence project completion for it enhances quality, project quality, reduces project cost and promotes efficiency in project management.

5.2 Recommendations

1. There is need for companies to conduct regular training for the team so as to enhance the effectiveness of

project software on project performance. This can be coupled with enhanced clear communication about usage of the software and by ensuring constituting a dedicated IT support team.

2. Companies using project software must ensure that there is a clear boarding processes, regular software updates, and integration of project software with other organizational platforms.

6. Acknowledgements

I thank God for His mercy and grace over my life, thus far He has brought me. Special thanks to my supervisor Dr. Chibomba, for your tremendous insight and guidance through this journey, which has resulted into a wonderfully nurtured paper. The completion of this study floats on your unwavering support. Many thanks to the Information and Communications University (ICU) Lecturers, for the great Knowledge imparted in me throughout my studies. Thank you so much for your dedication and commitment to adding value and shaping this generation. To the Zambia Research and Development Centre (ZRDC), thank you for your scholarship without which this achievement would not have been possible for me, for this reason, I will always remain your good Ambassador.

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