Project leadership competencies influencing success in Information Communication Technology projects

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Background: Information communication technology (ICT) is pivotal in shaping knowledge creation, information management, and project outcomes in the 21st century. The success of ICT projects relies not only on technical proficiency but also on non-technical factors. This underscores the importance of addressing technical and non-technical aspects in ICT project management for optimal project outcomes.

Objectives: This study highlights indispensable project leadership competencies for effective ICT project management and their roles in preventing project failures. The ultimate goal is to increase the success rate of ICT projects, by integrating the project leadership competencies in managing ICT projects.

Method: The research is carried out utilising a quantitative data processing method, with data quantification and perceptions measured using the Likert scale. The researcher's data-gathering method contains information acquired from a structured questionnaire. The data collected is analysed with the Statistical Package for the Social Sciences (SPSS version 22.0) analysis tool.

Results: The findings suggest that technical proficiencies are important; however, they are not the only attributes that matter. Although practitioners with technical skills are certainly indispensable, project managers (PMs) still require other competencies. As a result, the effectiveness of PMs' technical expertise should be balanced with soft skills.

Conclusion: The study indicates that there is no evidence suggesting that technical skills are less valuable than other competencies; however, it is evident that interpersonal skills are also crucial.

Contribution: This research contributes to better understanding how specific leadership competencies influence the success of ICT projects, aiming to enhance project management practices in the ICT sector.

Keywords: competencies; ICT organisation; project leadership; project management competencies; project managers; project success.

Introduction

In the rapidly evolving landscape of information communication technology (ICT), the successful execution of projects plays a pivotal role in determining the competitive edge of organisations. As technological advancements continue to redefine the global business environment, the need for effective project leadership within ICT organisations becomes increasingly pronounced. The complex nature of ICT projects necessitates a comprehensive understanding of the key leadership competencies that significantly influence project outcomes and success. This research explores key project leadership competencies influencing ICT project success and their impact on service delivery and innovation in this dynamic sector. Project management is widely regarded as a crucial practice for achieving success in modern businesses. It involves the application of knowledge, skills, procedures and project activities to accomplish the project's objectives, which include delivering unique services, products or results (Heagney 2011:25). Maltz et al. (2012:10–12) identified project management performance in terms of time, budget and quality dimensions. Consequently, projects within organisations require complete dedication and commitment from all participants, as the success or failure of any business project significantly impacts the organisation's present and future in the business environment (Riaz, Tahir & Noor 2013:100–103).

Vaheed, Tahir and Burhanuddin (2015:2706–2713) accentuate ICT as the foundation of modern life, supporting various sectors such as healthcare, manufacturing, business, organisations and education. Information communication technology project management involves overseeing technology-based projects, ensuring their successful planning, execution and delivery within budget and schedule. It requires navigating evolving technology landscapes, addressing technical challenges and aligning project objectives with organisational goals (Ayat et al. 2021:652–679). It is imperative for organisations to effectively implement various ICT projects to enable business transformation in today's interconnected world. Thus, it is significant to examine how project leadership competencies relate to project outcomes. The research aims to offer valuable insights to enhance excellence in managing ICT projects.

The purpose of the study

This descriptive study aims to ascertain whether the implementation of specific project leadership competencies and attributes within an ICT organisation leads to a higher success rate of ICT projects. Table 1 outlines the research question and objective.

Literature review

Information communication technology is delineated by its various qualities, which involve the fusion of cloud computing, enterprise resource planning (ERP) and digital information systems (Setiawati & Rohayati 2014:169–179). Projects frequently involve activities associated with the implementation, enhancement, alteration or substitution of ICT systems (Marnewick and Labuschagne 2012:78–79). Consequently, in developing countries such as South Africa, organisations depend on ICT to provide precise and timely pertinent information. Fenech and De Raffaele (2013:1–2) stipulate that ICT projects are theorised to function in a constantly evolving technological environment, which substantially raises risk and uncertainty. This is further accentuated by the relative scarcity of research in the ICT project management literature. As a result, ICT projects strongly depend on continuous user interaction, effective risk management strategies and the utilisation of optimal project management methodologies. These elements complement the conventional management of resources like personnel and equipment. Yang, Chen and Wang (2012:182–191) state that project managers (PMs) should oversee all projects at various locations in real time and collectively to evaluate an extensive number of issues with the purpose to mitigate risks that could lead to project failure.

Information communication technology projects are temporary endeavours and in common with other traditional projects, employ resources, scope, budget and are anticipated to provide results over time (Masamha & Mnkandla 2017: 38–40). Information communication technology projects frequently bring new hardware, software and new product developments as a component of the project (Dube & Chimoga 2022:172–185). Moreover, ICT projects result in the design and installation of a new software product. Information communication technology initiatives can be either huge or small and might involve one person or individuals (Ahmadzai & Paracha 2016:498–499). Information communication technology project development has evolved in many businesses to guarantee that the general expectations of clients in business requirements are met. Information communication technology projects differ from other projects in that they are more complex due to potential risks, such as teams with multiple members, difficulty in control management, lack of work discipline and entirely inaccurate cost and time forecasts that prohibit their effectiveness (Montequin et al. 2016:3–4).

In the contemporary era of the Internet and wireless telecommunications, organisations utilise ICT infrastructure to monitor their ongoing projects to improve efficiency and profitability and contribute to overall economic growth (Ishida 2015:79–88). Mnkandla and Marnewick (2011:76–94) are of the view that PMs' leadership capabilities are vital for project success. Muller and Turner (2010:199–203) argue that PMs', who hold complete authority to lead, supervise all project activities, and make crucial decisions have a pivotal role in shaping the overall outcome of a project. The Government Gazette ranked ICT and project management as the highest scarce skills in South Africa (Government Gazette 2018:8–9). Consequently, ICT-related tools and systems such as Project Management Systems (PMS) and Gantt charts are now available and are intended to improve projects and ultimately make the work of corporations easier, more effective and more efficient. Braude and Bernstein (2016:52) refer to this development and add that ICT-based systems and tools support project teams, satisfy customer needs and should be reliable, effective and maintainable for project success.

Research methodology

Research methodology refers to the systematic and theoretical examination of methods used in a research field. It covers strategies, processes and guiding principles for data collection, interpretation and analysis (Kapur 2018). An in-depth understanding of research methodology is crucial as it ensures the accuracy and reliability of research outcomes, by elevating the overall quality and validity of the study (Kabir 2016:202–209). The researcher adopted a positivist epistemological stance, interpreting data obtained from the questionnaire to substantiate the accuracy of the assertions. Positivism, as an epistemological stance in research, underscores empirical evidence, scientific methodologies and the objective scrutiny of phenomena. It asserts that knowledge stems from observable, quantifiable facts, emphasising objectivity and the use of quantitative data to

TABLE 1: Research question and objective.

Research question		Objective
RSQ 1	What leadership skills does a project manager need to efficiently oversee ICT projects?	To determine the leadership competencies required of a project manager to effectively manage ICT projects.

ICT, information communication technology.

construct and verify theories (Drakopoulos 2024). Moreover, positivism promotes consistent and reproducible research outcomes, thereby facilitating the development of reliable theories and progress in various fields.

Research design

Research design is the strategy that outlines how a researcher intends to integrate different components of a study coherently and logically (Flick 2022). A well-structured research design ensures that the study is organised, systematic and capable of producing reliable and valid results (Drakopoulos 2024:1–15). As a result, this research utilises quantitative descriptive designs to generate evidence because this technique is more effective in gathering research data theories (Drakopoulos 2024:1–15). The study employed a descriptive design, and the main goal of descriptive research is to offer a thorough and precise depiction of the population being examined. Descriptive research aims to describe, measure and document-specific characteristics or variables in a population; it provides factual and accurate information about the phenomenon (Saunders, Lewis & Thornhill 2019:67).

Research method

This study utilises a quantitative descriptive approach to produce results because it is more efficient in collating research data. The quantitative method, rooted in the positivist paradigm, prioritises collecting new data from a large population to address specific problems. It offers objectivity, precision, generalisability, statistical rigour and efficiency in handling large datasets promptly (Le & Schmid 2022:308–336). Quantitative methods enable statistical analysis, generalising findings across disciplines and emphasising research reliability and validity (Saunders et al. 2019:67).

Target population

The target population refers to the specific group of individuals or elements that the researcher intends to study or collect data from to draw conclusions and make inferences (Stratton 2021:373–374). This study consists of PMs, project administrators and project team members involved in the implementation towards the completion of projects in the ICT organisation. This study ensured reliability through examining procedures, validating data, assessing broader applicability and upholding the researcher's objectivity. Korstjens and Moser (2018:120–122) suggest that population validity refers to the ability to generalise study results from the sample to the broader target population and its subpopulations.

Sampling methods

Sampling methods are crucial for selecting a representative subset from a larger population for research or analysis, ensuring accurate conclusions and generalisations (Nardi 2018). Transparent reporting of sampling methods improves research credibility and study validity (Kandola et al. 2014:15–18). A simple random sampling is the chosen approach for this study. It involves selecting individuals from a population in a way that gives every member an equal chance of being chosen for the sample. This method ensures fairness and represents the population accurately in research (Nardi 2018). A biased sample differs systematically from the overall population, and the simple random sampling method is utilised to mitigate sampling bias (Majid 2018).

Sample size

The sample size is an important feature of any empirical investigation in which the goal is to deduce information about a population from a sample. A significant value of a sample must be between 30 and 500, depending on the type of population studied (Bougie & Sekaran 2019:103–113). Given the above, the chosen sample size for this study is subjectively set at a minimum of 100 respondents. The determination of this choice considers factors such as accessibility, sector type, as well as the level and certification criteria. The process involves randomly selecting samples from particular groups within the chosen organisation for the questionnaire (Stratton 2021:373–374). The size of the sample holds significance in empirical studies aiming to derive population information from a sample (Pandey & Pandey 2021). The primary aim of selecting a sample is to optimise precision within a defined sample size and mitigate biases in the selection process.

Data collection method

A data collection method is a systematic process of gathering information or data for research, analysis or monitoring purposes (Kabir 2016). The principal data collection tool for this study is the structured questionnaire. The questionnaire is separated into sections such as Section A, which contains biographical information and Section B, which contains participant perceptions measured on a Likert scale and Section C, which has open-ended questions. The results from questionnaires are easily quantified, allowing for scientific and objective analysis, and quantitative data is valuable for comparing research and measuring change (Saunders et al. 2019:67).

Data analysis

Data analysis is the process of examining and interpreting data to discover useful information, inform conclusions and support decision-making (Kabir 2016). The data collected is analysed with a particular reference to the research questions using SPSS version 22.0 to evaluate research data for the study. The decision to use SPSS version 22.0 is motivated by the program's reputation for being efficient and user-friendly for data analysis (Rubin & Babbie 2011:583). Therefore, utilising the connections among variables helps to interpret outcomes and provide enhanced validity and analytical capability for various testing methods and assessments during data analysis.

Ethical considerations

Ethics involves distinguishing appropriate from unethical behaviours (Resnik 2015:1–2). Throughout the research, ethical guidelines were followed; for example, privacy and confidentiality were prioritised, and information was redacted to maintain the integrity of the review process. The researcher obtained ethics clearance beforehand, maintained respondent anonymity, respected voluntary participation and ensured transparency about the research's purpose and data usage. The study was ethically approved by the Cape Peninsula University of Technology Research Ethics Committee (ethics clearance certificate number: 2021_FBMSREC066).

Results and discussion

The demographic profiles of respondents are demonstrated, and the discussions are framed in accordance with the study's objectives.

Demographic profiles of respondents

Comprehending the demographic profiles of respondents in a study on project leadership competencies in the ICT organisation is crucial for ensuring relevance, generalisability and applicability of the research findings, as well as for tailoring interventions to address the specific needs of different demographic groups within the organisation. The demographic profiles of respondents are depicted in Table 2.

Project leadership

Project leadership combines elements of leadership and management to oversee projects efficiently and effectively. It involves the role and responsibilities assigned to individuals or groups responsible for guiding and overseeing a project from its inception to its conclusion (Ahmed et al. 2016:2–5). Efficient project leadership encompasses various facets that require adaptability, merging strategic thinking, interpersonal abilities and a steadfast commitment to delivering exceptionally high-quality outcomes (Montequin et al. 2016:2–11). It also requires a blend of technical expertise, strategic alignment with organisational goals, stakeholder management, adherence to agile methodologies, cybersecurity, data management, resource allocation, quality assurance, change management, continuous learning, risk management and compliance with regulations. As a result, the significance of project leadership has grown due to the increasing prominence of project-based organisations in industries. Effective ICT PMs are critical to the effective implementation of technology projects within the organisation. PMs with the ability to achieve project goals, adhere to budget constraints, meet deadlines and satisfy stakeholders are of utmost importance (Maltz et al. 2012:10–12). Information communication technology PMs hold a central position in directing the efforts of the project team and managing resources to achieve successful outcomes. As a result, effective project leaders are those who can standardise these aspects to

TABLE 2: Demographic profile of respondents.

Demographics	Frequency	%
Gender		
Female	45	0.45
Male	55	0.55
Age group		
20–30	26	0.26
30–40	34	0.34
40–50	12	0.12
50–60	26	0.26
60–70	2	0.02
Qualification		
Matric	5	0.05
Diploma	31	0.31
Degree	56	0.56
Honours	2	0.02
Postgraduate diploma	4	0.04
Other	2	0.02
Positions		
Project manager	52	0.52
Project administrator	17	0.17
Project team members	27	0.27
Other	4	0.04
Years of experience		
0–5	40	0.40
6–10	38	0.38
10–15	20	0.20
Other	2	0.02
Involvement in projects		
More often	79	0.79
Not often	20	0.20
Other	1	0.01
Sizes of projects		
Small	19	0.19
Intermediate	33	0.33
Large	47	0.47
Other	1	0.01

complete projects punctually, within defined parameters and with exceptional results.

Project competencies

Project competencies, also known as project management competencies, encompass the specific knowledge, skills, behaviours and attributes that individuals or teams require to proficiently plan, execute, monitor and complete projects (De Rezende & Blackwell 2019:34–59). The aforementioned competencies are essential to ensure that projects are completed successfully. These competencies are crucial to ensure that ICT projects are completed on time, within budget and in alignment with the project's objectives and stakeholder expectations. Additionally, leadership competencies vary depending on the industry, sector or leadership level within an organisation. Organisations frequently establish distinct competencies essential for their project management positions, and professionals may pursue certifications like Project Management Professional (PMP) to showcase their proficiency in project management (Wong 2020). Project leadership competencies encompass a range of skills and attributes necessary for effectively guiding a project to

success (Hijazi 2021). Effective leadership in ICT projects requires a unique combination of skills due to the ever-changing nature of technology and the complex challenges it presents. This demands flexibility, forward thinking and strong problem-solving abilities. Figure 1 delineates the project leadership competencies essential in ICT projects.

The evaluation of ICT project leadership competencies shows a constant tendency towards agreement. The data suggests a strong inclination towards agreement, with 90% plus of respondents expressing agreement towards leadership, communication, technical, problem solving, decision-making and knowledge competencies. This suggests a considerable level of confidence and proficiency in these domains. The data indicates a strong consensus on leadership competencies, with 93% of respondents expressing agreement (44% agree, 49% strongly agree), while only 5% disagree (2% disagree, 3% strongly disagree) and 2% remaining neutral. Similar patterns are observed across other competencies, indicating a robust alignment towards agreement across different skill areas. Overall, there is a consistent trend of agreement across all competencies, with minimal dissenting opinions. This analysis indicates that the effectiveness of project leadership competencies greatly influences project success within the ICT sector. It underscores the necessity for ICT PMs to possess these skills to ensure successful project delivery. The effective ICT PMs should continually develop and refine their competencies to meet the evolving needs of their roles and organisations.

Information communication technology project leadership competencies for effective practice

Brinkmann (2013:567–583) ascribed competency as the combination of knowledge, expertise, skills, values, beliefs, core personal and behavioural attributes all of which are required to effectively manage projects. Competencies emphasise the significance of both tangible (knowledge and

skills) and intangible (personal attributes) qualities, which are crucial for effective management (Shet, Patil & Chandawarkar 2017:1–11). Moreover, competencies are essential for ICT PMs to traverse the complex and rapidly changing landscape of technology and effectively contribute to the organisation's success. Additionally, cultivating soft skills such as compassionateness, adaptability and effective communication can enhance leadership effectiveness in the ICT organisation. Figure 2 shows the ICT project leadership competencies, and these competencies are discussed in detail in the following sections.

Leadership competencies

Jowah and Laphi (2015:15–39) concur that leadership in project management entails interacting with individuals, and how these interactions occur can significantly impact the project's outcome. Therefore, regardless of the project's specific nature, effective PMs should possess a diverse skill set recognising the importance of both technical and interpersonal aptitudes. In accordance with best practices, PMs should provide guidance and direction that inspire team members, create team-building opportunities for the project team, give prompt feedback on individual and team performance, encourage creativity and innovative ideas from the project team, empower the project team through mentoring and coaching and should exhibit strong leadership capabilities. Hence, proficient PMs also demonstrate a high level of proficiency in project management skills, particularly in the domains of task scheduling and strategic planning.

Communication competencies

Communication competence entails understanding effective and appropriate communication patterns and having the ability to apply and adapt this understanding in different settings (Desai, Prasad & Patil 2023). Successively, PMs' effective communication motivates the project team to work ethically, see value in their work and dedicate themselves to
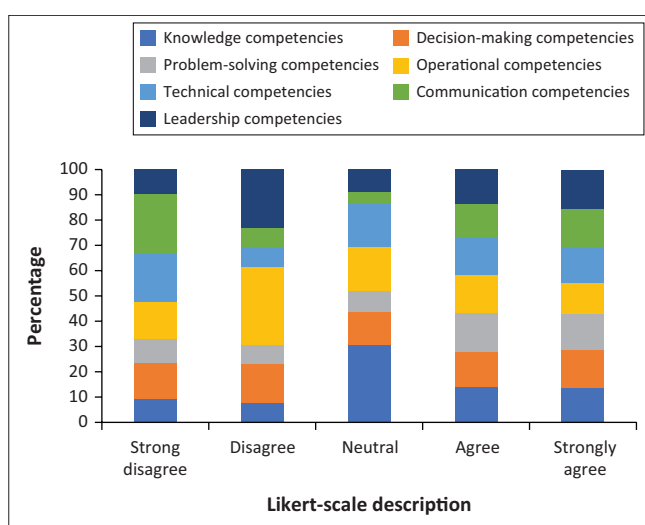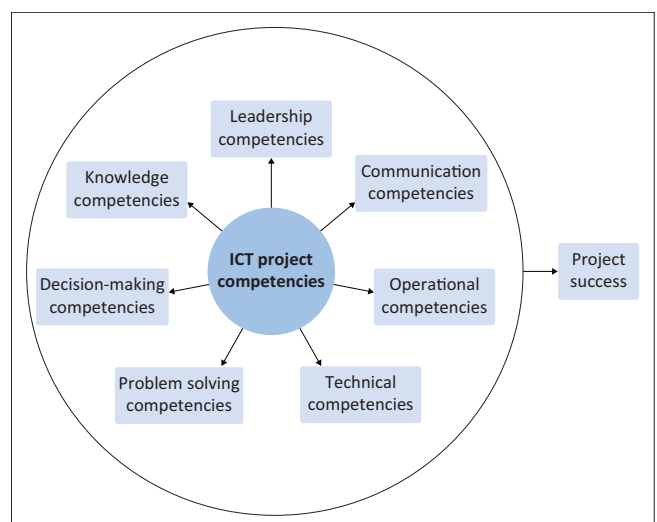

FIGURE 1: Information communication technology project leadership competencies.

ICT, information communication technology.

FIGURE 2: The nexus of Information Communication Technology project leadership competencies and project success.

delivering exceptional results. Therefore, proficient PMs who are capable of effectively leading ICT projects should provide a clear vision and direction to the project team, effectively communicate project objectives and milestones, clearly communicate the project scope, work breakdown structures (WBSs) and deliverables, discuss the project charter habitually and communicate and engage project stakeholders frequently. Hence, effective communication can only be successful once the sender and the receiver comprehend the same information.

Operational competencies

In the field of project management, operational competencies are termed as the capacity to efficiently utilise resources (April & Govender 2022:90–103). Project Managers in the ICT organisation should possess an immersed understanding of the operational processes. This knowledge is essential for effective project planning and scheduling. This ensures that PMs can make well-informed decisions while overseeing projects within the domain of ICT processes, aligning the strengths of the project team with specific tasks, prioritising effective communication, fostering teamwork and facilitating conflict resolution. As a result, PMs should also balance task performance and maintain positive work relations. Maintaining positive working relations is just as crucial as achieving project outcomes, as it ensures long-term success and paves the way for future collaborations on projects. Therefore, the balance between task performance and work relations is vital. Even so, project management in the ICT industry is not just about technical knowledge but also about soft skills, understanding operational processes, fostering innovation and promoting effective teamwork. Thus, PMs who excel in these areas are better equipped to lead ICT projects successfully.

Technical competencies

Technical competency refers to the knowledge, skills, abilities and expertise that individuals or the project team possess in a specific technical or specialised area (Barna 2013:17–21). It involves having a deep understanding of the principles, concepts, tools and technologies relevant to a field or profession. In the field of ICT, PMs should have a solid understanding of the standard workflows and processes. This knowledge enables them to navigate projects more effectively and make informed decisions throughout project planning, execution, monitoring and controlling, relying on a range of tools and resources. Additionally, PMs should have the necessary technical expertise to comprehend the intricacies of the product or service and its underlying technologies. Consequently, mastery of project management software, the ability to employ risk assessment techniques and competence in using associated tools are all fundamental requirements concerning technical competency. Hence, PMs need to also create realistic schedules, considering dependencies, resources and risks, ensuring projects meet timelines and budgets.

Problem-solving competencies

Papke-Shields, Beise and Quan (2010:650–662) characterised problem-solving skills as the capability to handle problems when the solution is not readily apparent. Problem-solving involves understanding, generating and evaluating solutions, as well as planning, adapting and learning from the processes involved. Hence, ICT PMs should be skilled at identifying and thoroughly analysing problems as they arise. As a result, engaging with the project team when addressing problems is paramount, as team members often hold valuable insights and expertise that aid in resolving issues. Additionally, decisions should be based on concrete facts and data rather than intuition or assumptions; this promotes transparency and accountability in decision-making. Information communication technology PMs should have a robust risk management strategy in place. This involves not only identifying and assessing risks but also developing mitigation plans. This method should outline specific actions to be taken if problems or risks materialise during the project. Therefore, ICT PMs should have a proactive mindset and be prepared to address problems as soon as they arise. Prompt identification and resolution of problems are critical in ICT project management as delayed action can lead to escalated issues, cost overruns or missed deadlines.

Decision-making competencies

Decision-making entails making decisions and taking actions that align with an organisation's goals and objectives (Khatib, Mulla & Ketbi 2022:88–109). Similarly, ICT PMs are encouraged to have access to all relevant data before making decisions. Moreover, ICT PMs should have the ability to make crucial decisions. Inaccurate decisions made at the wrong time could lead to project failure, whereas good decisions made at the right time are likely to affect a project's success. In the ICT project environment, ICT PMs should understand and adhere to the decision-making processes and should be aware that effective decision-making process design generally strengthens the likelihood of project success. Therefore, ICT PMs should acknowledge that there will be consequences resulting from their decisions, whether negative or positive. Therefore, effective decision-making relies on the use of critical thinking abilities, which involve objectively assessing information, identifying relevant factors and making logical decisions.

Knowledge competencies

Kerzner (2017) asserts that it is essential for PMs to have a clear understanding of the primary goals of a project, which involves setting SMART (Specific, Measurable, Achievable, Relevant and Time-bound). This clarity ensures that the entire team shares a common goal, reducing confusion and enhancing overall productivity. Effective ICT PMs understand team motivation, foster trust and identify stakeholders' interests. This knowledge improves leadership capabilities and facilitates informed decision-making aligned with organisational objectives. As a result, risk management is also a critical facet of knowledge competency, and ICT PMs should be well versed in recognising potential risks and

challenges that could impact a project or the organisation. This involves identifying, assessing and devising strategies to mitigate risks. Therefore, a proactive approach to risk management helps prevent issues from derailing progress. Project Managers in the field of ICT who possess expertise and knowledge in creating and utilising Gantt charts effectively can streamline project workflows, allocate resources optimally and monitor progress to ensure timely completion of milestones. This is due to the significant value that Gantt charts provide in visualising project timelines, dependencies and resource allocation, making them an essential tool in ICT project management.

Conclusion

Effective project management in the ICT industry requires a variety of competencies that encompass technical, interpersonal, and strategic proficiencies. In the fast-paced and ever-evolving ICT industry, successful project management requires a comprehensive set of competencies that encompass technical expertise, interpersonal skills and strategic acumen. These competencies are crucial for navigating the complexities of technology projects and contributing to organisational success. In today's digital age, the role of ICT PMs is critical in driving growth and competitiveness, emphasising the importance of developing and honing these competencies. By mastering these skills, ICT PMs can effectively deliver successful projects that meet intended outcomes, contribute to organisational growth and navigate the challenges of the fast-paced ICT industry. Therefore, a multifaceted approach to competency development is essential for effective ICT project management.

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Authors' contributions

S.M. authored the manuscript with guidance from L.E.J., notably on the introduction, discussions and conclusion. L.E.J., and S.M. reviewed and approved the final version of the manuscript.

Disclaimer

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