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Investing in project management certification: Do organisations get their money's worth?

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Abstract The professionalisation of project management has been a contentious topic for some time. Project management certification is seen as a step towards the professionalisation of the discipline. Certifications were developed as a means to provide individuals with the appropriate knowledge and skills required to deliver projects successfully. Although project management certification programmes are now commonplace across the globe, research is yet to fully investigate the true influence certifications have on project performance. This paper revealed that South African IT project performance is not influenced by project management certification. Moreover, it was established that certifications need to be redesigned to ensure that the professionalisation of project management remains on track.

Keywords Project management certification · IT project management · Project management professionalisation · South Africa

1 Introduction

Project management has been evolving towards professionalisation for some time. Certification is considered the silver bullet required to ensure that the appropriate competency is achieved for sustainable project success [1, 2]. Project management expertise and competency continually emerge as a key factor for realising project success [3–5]. Project management certifications were subsequently developed as a means to provide individuals with the appropriate knowledge and skills. Certification programmes are now commonplace across the globe [6–10]. PricewaterhouseCoopers (PWC) conducted a survey in 2007 which revealed that 77% of respondents held project management certifications [11]. Similarly, the 2013 Prosperus report, an African project management report, revealed that the information technology (IT) industry had the highest number of certifications with 69.7% of respondents having some form of formal project management certification [4]. Both studies revealed the two predominant certifications are PMP and PRINCE2 Practitioner [4, 11]. PWC and the Project Management Institute (PMI) assert that projects are more likely to succeed when project managers have certifications [11, 12]. There is contention, however, that project management certification is not essential for achieving project success, especially for IT projects [13–17]. Starkweather and Stevenson [16] discovered that PMP certification presence does not translate to improved project success. Furthermore, Wells [18] discovered that PRINCE2 certification has no benefit on IT projects. Organisations spend significant amounts of money on acquiring project management certifications as approximately USD$9.87 million was spent over the past 12 years [19–22]. Considering the significant cost to organisations, it is imperative that project management certifications positively influence IT project performance.

This research aims to investigate whether the South African IT project performance landscape is comparable or contradictory to previous studies [11, 12, 16, 18, 23]. Moreover, this research takes a different stance as it does

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not focus on whether project management certification has a positive theoretical influence on IT projects but rather what practical influence it has on IT projects. The purpose is to provide critical insight into whether project management certifications provide the proposed value to organisations. This study contributes to IT project management research by highlighting that IT project performance was not influenced by project management certification presence. Furthermore, this study contradicts previous studies which state that projects are more likely to succeed when project management certification is present [11, 12].

This paper is presented in seven sections. The first section provides a concise literature review about IT project performance and project management competency. Section two deals with the research methodology employed within this research. The third section presents the initial results and interpretation. The fourth section provides further analysis and interpretation of the data. The fifth section discusses the all the analysis results. The sixth section provides limitations of the study while the final section concludes the paper and a number of recommendations are provided based on the results.

2 Literature review

2.1 The state of IT project performance

The performance of IT projects has been studied for more than a two decades [24–26]. The CHAOS Chronicles and Prosperus report are two studies which determine the performance rate of IT projects in the United States of America and South Africa respectively [4, 5]. Both studies reported the percentage of successful, challenged and failed IT projects. The following categorisation is used:

- *Successful project* A successful project is a project that is delivered on time, within budget, within scope and complies with the quality requirements. It delivers strong value, the expected value.
- *Challenged project* A challenged project is a project that is completed, but is either late, over-budget or does not meet all the requirements. It delivers moderate value, less than what was anticipated.
- *Failed project* A failed project is a project that is never completed or does not meet customer requirements. It delivers very little value or no value at all.

The 2015 CHAO Chronicles results show that 29% of IT projects were successful, 52% were challenged and 19% were failures [26]. Similarly, the 2013 Prosperus report revealed that 34% of IT projects were successful, 32% were challenged and 34% were failures [27]. This implies that a third of IT projects delivered quality solutions and

strong business value and that organisations are wasting valuable resources especially given that they use IT projects to implement strategic goals and objectives. A key driving force in achieving project success is the project manager's competency [4, 5, 12, 25, 28–30]. Acquiring and applying the necessary project management competency is therefore pivotal in achieving project success as well as ultimate organisational success [31].

2.2 Project management competency

There are many definitions of project management competency. Most definitions describe project competency as the realisation of effective project performance through the demonstration and application of knowledge, skills as well as tools and techniques [3, 13, 28, 29, 32–34]. The overarching concept of project management competency is therefore supported by the interrelationship of constructs knowledge, skills as well as tools and techniques.

2.2.1 Knowledge

Project management knowledge is "[w]hat the project manager knows about the application of processes, tools, and techniques for project activities" [35]. A project manager's competency is therefore determined by the knowledge they exhibit [29]. Project management knowledge revolves around understanding project management "through experience, education, observation and investigation" [36]. There are two distinct forms of knowledge, viz. explicit and tacit knowledge [37–39]. Explicit knowledge is acquired primarily through education while tacit knowledge is acquired through experience [37, 39, 40]. For example, the Project Management Professional (PMP) certification tests individuals on the ten knowledge areas within the Project Management Body of Knowledge (PMBOK) [34, 35]. Understanding the ten knowledge areas is considered explicit knowledge as they can be learnt by attending a PMP training programme. Conversely, tacit knowledge is challenging to communicate and distribute as it emphasises beliefs, perceptions and values [40]. Project managers become subject matter experts over time as they work on multiple projects of varying complexities [41] which translates into an instinctive ability to effectively manage projects and also facilitates the development of skills.

2.2.2 Skills

Skills are developed through the application of knowledge (explicit and tacit) as individuals must understand how to apply their knowledge in any given situation [42]. Miller [42] however contends that knowledge does not

automatically translate to skills and that skills development is continuous. The notion therefore is that project managers articulate their knowledge in the form of skills through education and experience [29, 43, 44]. Project managers must be able to apply their skills to "project activities to meet project requirements" [34]. Furthermore, there must be a balance of technical and soft skills to deliver a project successfully [13, 14, 30, 45, 46]. Technical skills relate to a project manager's ability to understand and apply project management tools and techniques while soft skills relate to dealing with the human element [13, 41, 47]. The following soft skills have been empirically validated as important: decision making, delegation, teamwork, problem solving, leadership, negotiation and reporting ability [13, 28, 43, 47, 48]. With regard to technical skills, understanding methods, processes and procedures as well as technology and computer skills are considered paramount for managing any type of project [14, 43].

2.2.3 Tools and techniques

Project management tools and techniques assist the project manager and team in completing a project successfully [3, 34, 36]. Tools, such as project management software, are employed to facilitate effective and efficient project management. Techniques are logical procedures employed to "perform an activity to produce a product or result or deliver a service" [34]. While there are a plethora of tools and techniques, several prevalent tools and techniques are employed, viz. project management software, work breakdown structures, Gantt charts, critical path method, earned value, progress reports and lessons learnt reports [3, 49–51].

The relationship between the three project management competency constructs is functional and interrelated. Project management knowledge is required as the basis for developing both technical and soft project skills. The key is to apply the knowledge in an effective manner and use it to perform project activities accordingly. The ability to use project tools and techniques is supported by a project manager's skills and knowledge. Project management competency is therefore the ability to use tools and techniques through the application of knowledge and skills.

2.3 Project management certification

Although there are a variety of project management standards available [34, 52–55], this is not enough to facilitate the development of project management as a profession. Project managers are required to develop many competencies to manage projects successfully and establish themselves as true professionals within the discipline. The drive to professionalise project management has compelled professional bodies to use standards to underpin the development of project management competencies and certifications [1, 28]. Many project management certifications have been developed over the years to professionalise the discipline [1, 28, 56, 57]. A certification programme is "designed to test the knowledge, skills, and abilities required to perform a particular job, and, upon successfully passing a certification exam, to represent a declaration of a particular individual's professional competence" [58]. Furthermore, "certification and professional accreditation are used as ways to promote and legitimate a certain area" [15] to ensure that an individual has the appropriate skills and knowledge to implement sound practices [23]. The underlying assumption around project management certification is that it provides project managers with the knowledge and skills to perform project activities successfully and realise project success [59, 60].

The following standards underpin the most prevalent certifications [1, 56, 57]: PMBOK, ICB, APMBOK and PRINCE2. The majority of project management certifications are based on the PMBOK, which implies that the PMI's standard is arguably the most widely accepted project management standard [6, 8, 15, 61, 62]. The International Organization for Standardization (ISO) developed ISO 17024 to serve as a "global benchmark for personnel certification programmes to ensure that they operate in a consistent, comparable and reliable manner worldwide, thereby allowing individuals to have skills that translate across national lines" [63]. Only six project management certifications are ISO 17024 certified, viz. PMP, PRINCE2 Practitioner and the four IPMA certifications. It could therefore be argued that not all certification programmes are consistent, comparable and reliable, especially with regard to the pedagogical approach. Various types of assessments are adopted for certifications including the predominant type of multiple-choice exams [64]. Walker [65] however emphasises that certifications are too theoretical and require more practical components that enhance an individual's ability in real-world situations. There are two common learning environments for certification programmes, viz. formal study or self-study. Formal study programmes arguably lead to better knowledge transfer and articulation than self-study courses as individuals interact directly with course facilitators [66].

The cost to organisations should be considered regardless the influence project management certification has on project performance [67]. A total of 21 935 individuals were PMP certified worldwide between February 2014 and July 2014 [21, 22] which translates to an industry cost of USD$40.69 million [22, 68, 69]. Approximately 4800 individuals have been certified over the past 12 years in South Africa [19, 21] which translates to USD$9.87 million [20]. Considering the significant cost to organisations, it is

imperative that project management certifications have a positive influence on project performance.

2.3.1 Project management certification and project performance

PWC conducted a survey in 2007 which revealed that 77% of respondents held project management certifications [11]. This was an increase from the previous figure of 73% in 2004. The two predominant certifications were PMP and PRINCE2 Practitioner. Combined, PMP and PRINCE2 certification increased from 24% in 2004 to 46% in 2007. Individually, PMP represented 36% of certifications while PRINCE2 represented 10% of certifications. The 2013 Prosperus report presented the state of project management certification within a multitude of African countries and multiple industries [4]. The report indicated that the majority of South African respondents (32.3%) did not have any form of formal project management certification. However, it was evident that the IT industry had the highest number of certifications with 69.7% of respondents having some form of formal project management certification. Interestingly, the two predominant certifications were PMP (23.1%) and PRINCE2 Practitioner (11.8%), which is comparable to the 2007 PWC survey.

The PWC survey also observed that projects are less likely to fail when project managers have certifications. The survey showed that 80% of high performing projects have certified project managers. Similarly, PMI revealed that projects are more likely to succeed if organisations continuously facilitate project management competency development, either in the form of certifications or in-house programmes [12]. Ekrot et al. [70] argue that there is a movement towards in-house certification programmes. Alternatively, PricewaterhouseCoopers [71] contends that organisations should certify staff in the project management methodology they employ. For example, PRINCE2 Practitioner presence is necessary when employing PRINCE2 methodology. There is however debate as to whether project management certifications improve project performance. Starkweather and Stevenson [16] argue that PMP certification presence does not translate to improved project success as their results were inconclusive. Wells [18] discovered that PRINCE2 certification results in "[n]o benefit due to lack of usage or poor implementation". Furthermore, a respondent in the study stated that "I don't use a methodology at all. I rely on common sense" [18]. certifications have little value to IT project performance, as valuable skills and knowledge are acquired primarily through mentoring and experience [13, 14, 16, 17]. Similar to Miller [42], Catanio et al. [59] argues that certification does not ensure quality even though it is an indicator of knowledge. Research subsequently argues that more emphasis should be placed on soft skills as they play a more pivotal role than technical skills during IT projects [13, 14]. This aligns to studies which argue that certification is not deemed compulsory to be a successful project manager and is acquired primarily for authenticity and not because the industry requires it [23, 72]. IT project participants could also be acquiring certifications to improve their job prospects rather than to improve their project management skills and knowledge [15, 23, 72]. Alternatively, certified participants may have become more complacent with their skills and abilities and thus neglect the important, yet basic, aspects during the project life cycle [73, 74].

2.4 Hypotheses and model

Literature argues that PMP and PRINCE2 Practitioner are the two most prevalent project management certifications adopted in practice [4, 11]. The emphasis of this research is therefore on these two project management certifications. On the one hand, studies argue that project performance is enhanced by certification presence [11, 12]. Alternatively, there is contention that project management certification does not positively influence project performance as it is not deemed compulsory to be a successful project manager or required by industry [16, 18, 23, 72]. This research aims to investigate whether the South African IT project performance landscape is comparable or contradictory to previous studies [11, 12, 16, 18, 23]. Moreover, this research takes a different stance as it does not focus on whether project management certification has a positive influence on IT projects but rather what influence does it have on IT projects. Literature on IT project performance argues that project performance should be categorised into the three categories of successful, challenged and failed [4, 5]. This research adopts this philosophy of performance assessment to illuminate how PMP and PRINCE2 Practitioner influence the three project performance categories. The following hypotheses are tested:

H1a PMP certification has an influence on failed IT projects.

H1b PRINCE2 Practitioner certification has an influence on failed IT projects.

H2a PMP certification has an influence on challenged IT projects.

H2b PRINCE2 Practitioner certification has an influence on challenged IT projects.

H3a PMP certification has an influence on successful IT projects.

H3b PRINCE2 Practitioner certification has an influence on successful IT projects.

The subsequent research model is presented in Fig. 1.
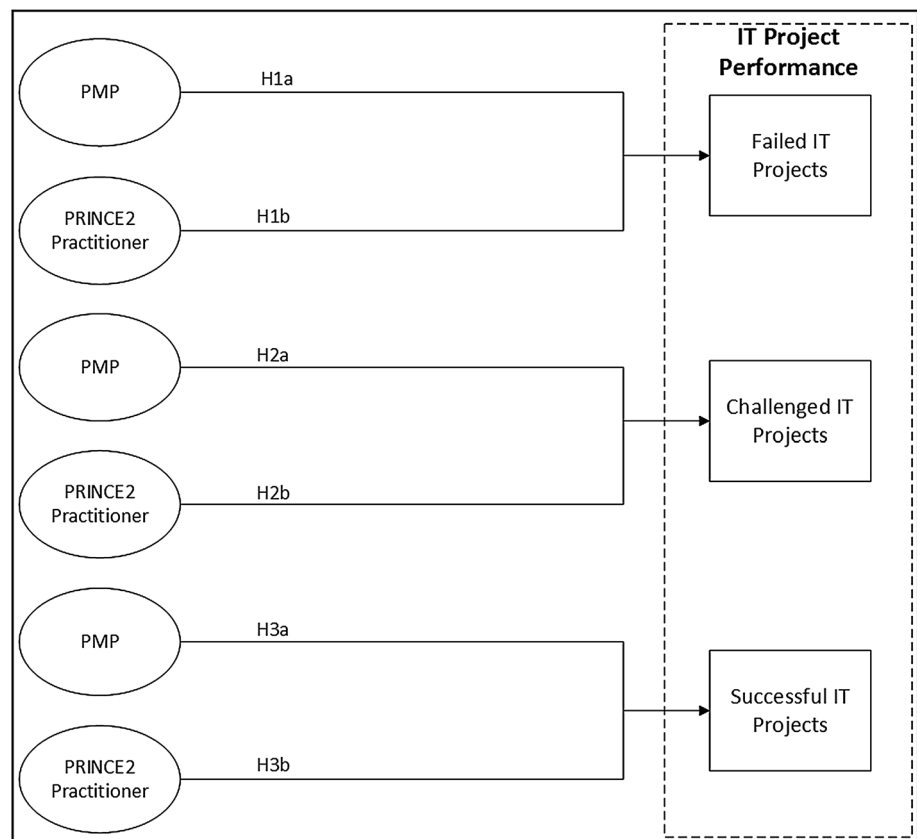
3 Research methodology

3.1 Survey design

A quantitative approach was used in this research as the primary aim was to explore the quantitative characteristics of the influence of project management certifications on IT project performance. A structured questionnaire was used, which facilitated the quantitative analysis of the gathered data [75, 76]. The key reason for adopting a structured questionnaire was that it ensured that each respondent was presented with the exact same questions in the same sequence. Moreover, this allowed the researchers to reliably aggregate and compare the responses between different sample subgroups or different survey periods.

The structured questionnaire was developed based on the CHAOS Chronicles and the Prosperus report [4, 5]. Firstly, the CHAOS Chronicles was used as it is the most widely cited statistics in the IT project realm [77, 78]. Secondly, the Prosperus report was used as it reports IT

project statistics in the South Africa context [79, 80]. The questionnaire consisted of three sections with "Appendix 1" focusing on the maturity of the processes contained in the knowledge areas of PMBoK® Guide. "Appendix 2" focused on project involvement and the performance of projects respondents were involved in. The three categories of IT project performance from CHAOS Chronicles and the Prosperus report were used in this section [4, 5]. Furthermore, this section provided definitions for the three categories to assist respondents when determining which performance category their respective projects sit. "Appendix 3" focused on gathering demographic information from the respondents. Project management certification was presented in this section.

Face validity and content validity were used in this research. Face validity refers to the connection between questions and objectives of the study [81, 82]. The purpose of this research was clear to the respondents and thus it can be deduced that there is high face validity. Content validity is the extent to which the items on a test are fairly representative of the entire domain which the test seeks to measure [82]. The questionnaire was evaluated by subject matter experts. These experts were IT project management experts, who evaluated the questionnaire on the following criteria:

Fig. 1 Research model

- The layout was logical.
- The questions collected relevant data to answer the various research hypotheses.
- All relevant project management certifications were listed.

3.2 Data collection

The unit of analysis for this research was IT project participants who were involved in IT projects in South Africa during 2011 and 2013. These were two separate studies and formed part of a longitudinal study that started in 2003. A dualistic approach was taken to gather responses, namely a web-based survey as well as a manually distributed survey. Both these approaches used the structured questionnaire as a basis. The web-based survey was designed and hosted on SurveyMonkey (www.surveymonkey.com). The web-based survey was open to the public while the targeted survey focused on specific individuals. The second approach made use of hard copies of the structured questionnaire and the specific targeted individuals were asked to complete the questionnaires manually. A total of 1731 responses were received, with 1067 and 664 for 2011 and 2013 respectively.

Probability sampling was used since this research focused on providing a representative view of the unit of analysis for the purpose of generalisability [82]. Simple random sampling was selected because it not only provides results which are highly generalisable, but also adequately represents the target population. Furthermore, since this form of sampling exhibits low bias, the results obtained would provide an objective view of the research problem.

Reliability ensures that the measurement instrument can be interpreted consistently across different situations [81]. Test–retest is relevant when a questionnaire is sampled more than once under comparable conditions. In this longitudinal study, it was the second time the questionnaire was sampled and the responses over the two sampling years were consistent.

Data analysis was performed using the following statistics:

- Descriptive statistics were used to describe and summarise the various characteristics of the data quantitatively [82, 83]. This will provide an overview of project management certification prevalence and overview of its influence on project performance.
- *T* tests were used to test whether there was a significant mean difference between two groups [82, 84]. The data was analysed to assess whether there was a significant difference between IT project performance with and without certification presence.

- The correlation statistic reveals whether there is a strong or weak relationship among variables, as well as whether the relationship is positive or negative [82, 85]. Correlation analysis was used to determine whether there are relationships between certification presence and IT project performance. The aim is to validate or contest the *t* test findings.

4 Initial analysis and interpretation

4.1 Overview of project management certifications

Similar to the PWC survey, respondents were asked to indicate what project management certification they possessed, as this would facilitate the analysis of certification influence on IT project performance. In 2011, 39% of respondents indicated they possessed no project management certification, whereas 61% did possess a certification. In 2013, 49% possessed no certification, whereas 51% possessed a certification. Although the results imply that there has been a 10% decrease in certification adoption, this cannot legitimately be inferred as two different samples were analysed for 2011 and 2013. However, it is possible that organisations place less emphasis on IT project participants being project management certified, since these types of projects exhibit a number of fundamental differences compared to other projects. Moreover, these results could be evidence that organisations are more interested in soft skills because certifications focus primarily on technical skills [13, 14, 47].

Further analysis was performed to investigate the distribution of project management certifications amongst respondents and the results are depicted in Table 1. The majority of respondents indicated that they had no project management certification, with the results being 43.3 and 59.1% for 2011 and 2013, respectively. This suggests there was a 15.8% decrease in project management certification

Table 1 Certification distribution 2011 and 2013

Certification	2011 (%)	2013 (%)	% Change
None	43.3	59.1	15.8
PMP	29.5	12.5	−17.0
PRINCE2 practitioner	12.9	15.4	2.5
IPMA level B	8.2	5.3	−2.9
CAPM	4.9	3.1	−1.8
IPMA level C	0.7	3.6	2.9
IPMA level D	0.5	1.0	0.5
Total	100	100	

presence, as there were more IT project participants without project management certification than with it. The two most prevalent certifications for 2011 were PMP and PRINCE2 Practitioner at 29.5 and 12.9%, respectively. Similarly, the 2013 results indicated that the top two certifications were PRINCE2 Practitioner and PMP at 15.4 and 12.5%, respectively. However, only PRINCE2 Practitioner saw an increase in presence, whereas PMP saw a decrease in presence in 2013. It is possible that the decrease in PMP certifications is attributed to individuals allowing their certifications to lapse and not recertifying themselves. The two predominant certifications over both years were PMP and PRINCE2 Practitioner, which is comparable to the PWC survey [11]. Furthermore, the results suggest that there has been an overall decrease in project management certification presence within the South African IT project management domain.

4.2 Project management certification and IT project performance

A more in-depth analysis of responses reveals the influence certifications have on IT project performance. The results were categorised according to IT project performance, viz. failed, challenged and successful. Figure 2 illustrates the 2011 results for failed, challenged and successful IT projects with and without certification.

The results imply that IT projects are less likely to fail, albeit to a minor extent, if participants possess certification. Some 13% failed with certification presence, whereas 15% failed without certification presence. Similarly, 33% of projects were challenged with certification presence, whereas 37% were challenged without certification presence. IT project success is improved considerably with certification presence, as 54% were successful but 48% were successful without certification presence. It is arguable that project management certifications enable project managers and other participants to apply the three constructs of project management competency effectively
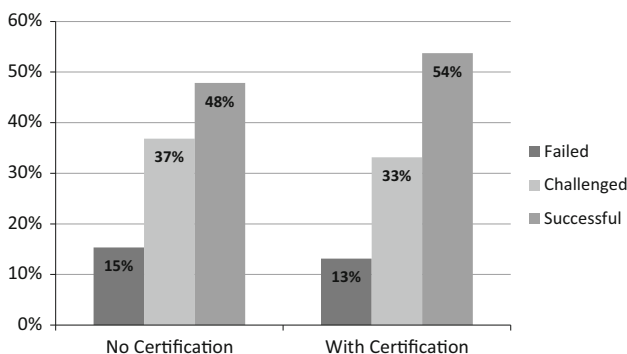
during the project management life cycle. Conversely, certification has minimal influence on failed and challenged IT projects. There was minimal difference between projects with and without certification presence. Moreover, it could be that certified respondents exhibit the soft skills which IT projects require based on experience needed for certification.

The 2013 results are illustrated in Fig. 3 and completely contrast the 2011 results. In 2013, more IT projects failed with certification presence—22% failed, whereas 10% failed with no certification presence. Similarly, 33% of projects were challenged with certification presence, whereas 31% were challenged with no certification presence. Project management certification did not improve the IT project success rate—45% were successful with certification presence, whereas 59% were successful with no certification presence. The results are comparable to Stevenson and Starkweather's study [13] which argued that leadership, ability to communicate, verbal skills, written skills and ability to deal with ambiguity and change are more important than project management certification for IT project management success. Moreover, organisations could be providing employees with in-house project management training that is tailored specifically to IT project management within the organisation. Current project management certifications are very theoretical in nature and are often assessed by means of multiple-choice exams. These do not test an individual's ability to apply their newly acquired knowledge and skills [86, 87].

The data was further dissected to show the influence each certification has on IT project performance. Figure 4 illustrates 2011s IT project performance for each certification. The top three performing certifications were PMP, PRINCE2 Practitioner and IPMA Level B. PMP led to 56% IT project success, and PRINCE2 Practitioner and IPMA Level B led to 52% project success, implying that these certifications have a mediocre influence on IT project success. About a third of projects were challenged with PMP, PRINCE2 Practitioner and IPMA Level B presence,
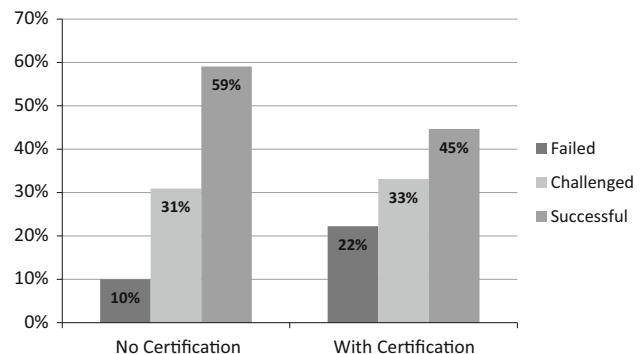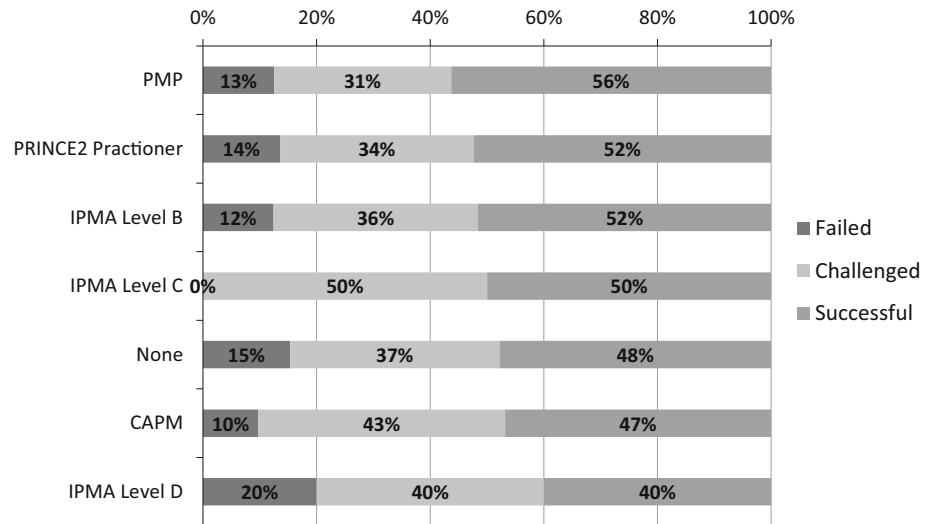
Fig. 2 2011 IT project performance

Fig. 3 2013 IT project performance

Fig. 4 2011 IT project performance versus project management certification

which further suggests these certifications are not entirely beneficial to IT projects. IT project performance was poor where IPMA Level D, CAPM or no certification was present. IPMA Level D and CAPM are introductory project management certifications, implying that they do not provide an individual with enough skills and knowledge to ensure IT project success. Furthermore, it could be argued that participants who had no certification did not have the three constructs of project management competency in place for effective IT project performance.

Figure 5 illustrates 2013s IT project performance for each certification. IPMA Level B and PMP were the top two performing certifications in 2013, along with no certification. Contrary to 2011s results, no certification led to 59% project success, 31 and 10% were challenged and failures, respectively. This appears to be an anomaly but it could be that these individuals have developed significant experience within the IT project management domain and are able to apply the acquired skills and knowledge

effectively. The three worst performing certifications were IPMA Level D, PRINCE2 Practitioner and IPMA Level C.

5 Further analysis and interpretation

The initial results confirmed that the top two certifications are PMP and PRINCE2 Practitioner (Table 1). However, the above results only provide a brief overview of the data as descriptive statistics were used. The following results use inferential statistics to provide a more in-depth analysis of the data. T tests were used to analyse whether there was a significant difference between IT project performance with and without project management certification presence. IT project performance (successful, challenged and failed) were the dependent variables while each certification was the independent variable. Bootstrapping was used to reduce the influence of potential bias within the data [84]. The bias corrected accelerated (BCa) confidence

Fig. 5 2013 IT project performance versus project management certification

interval (CI) was set to 95%. Furthermore, Cohen's d was used to measure the effect size. The following criteria were used to determine the scale of the effect: d = 0.2 (small), 0.5 (medium) and 0.8 (large) [84, 88, 89].

5.1 PMP and failed IT projects

The *t* test results for failed IT projects with PMP presence are presented in Table 2. These results were used to answer hypothesis H1a. The 2011 results show that IT projects failed less on average with PMP certification presence (M = 1.05) than without (M = 1.4). This was significant (p = 0.039) and implies that PMP presence results in less IT project failure. The 2013 results show that IT projects failed more with PMP certification presence (M = 1.9) than without (M = 0.94). This was significant ($p = 0.032$) but contradicts the 2011 results since it implies that IT failure is more likely with PMP presence. A collective analysis of both 2011 and 2013 shows that IT projects failed more with PMP presence (M = 1.30) than without (M = 1.20). This, however, was not significant ($p = 0.564$), implying that PMP certification has no influence on IT project failure. Accepting or rejecting hypothesis H1a was determined by the collective result. Hypothesis H1a was therefore rejected as the result was not significant.

5.2 PMP and challenged IT projects

Hypothesis H2a was tested using the *t* test results from Table 3. The 2011 results show that IT projects were less challenged on average with PMP presence (M = 2.6) than without (M = 3.17). This, however, was not significant ($p = 0.077$). IT projects were more challenged with PMP

Table 2 PMP certification and failed IT projects *t* tests 2011 and 2013

Failed IT Projects (PMP)			
	2011	2013	Collective
Mean (with certification)	1.05	1.9	1.3
SE (with certification)	0.121	0.432	0.154
Mean (without certification)	1.4	0.94	1.2
SE (without certification)	0.071	0.078	0.053
Mean difference	0.351	−0.964	−0.094
Confidence interval (lower)	0.082	−1.979	−0.431
Confidence interval (upper)	0.637	−0.126	0.204
Degrees of freedom (*df*)	773	54.344	220.494
t value (*df*)	2.071	−2.197	−0.578
Significance (*p*)	0.039[a]	0.032[a]	0.564
Effect size (d)	0.19	0.563	0.056

[a] Significant at 95% confidence interval

Table 3 PMP certification and challenged IT projects *t* tests 2011 and 2013

Challenged IT Projects (PMP)			
	2011	2013	Collective
Mean (with certification)	2.6	2.83	2.67
SE (with certification)	0.265	0.541	0.245
Mean (without certification)	3.17	2.21	2.76
SE (without certification)	0.131	0.115	0.091
Mean difference	0.563	−0.615	0.091
Confidence interval (lower)	−0.13	−1.844	−0.372
Confidence interval (upper)	1.235	0.454	0.539
Degrees of freedom (*df*)	773	55.684	1307
t value (*df*)	1.768	−1.112	0.367
Significance (*p*)	0.077	0.271	0.714
Effect size (d)	−0.171	0.246	−0.03

presence (M = 2.83) than without (M = 2.21) in 2013. This was once again not significant ($p = 0.271$) and corresponds to 2011's results. A collective analysis shows that IT projects were more challenged with PMP presence (M = 2.67) than without (M = 2.76), but this was not significant ($p = 0.714$). The above results therefore imply that challenged IT projects are not influenced by PMP certification, as there was no significant difference between projects with and without PMP presence. Hypothesis H2a was rejected as the collective results were not significant.

5.3 PMP and successful IT projects

The *t* test results for successful IT projects with PMP presence are presented in Table 4. These results were used to test hypothesis H3a. Successful IT projects were more likely on average with PMP presence (M = 4.71) than without (M = 4.36) in 2011. This, however, was not significant ($p = 0.392$). IT projects were more successful with PMP presence (M = 4.15) than without (M = 4.07) in 2013, but there was no statistical significance ($p = 0.884$). A collective analysis shows that IT projects were more likely to be successful with PMP presence (M = 4.54) than without (M = 4.24), but once again this was not significant ($p = 0.345$). The above results therefore confirm that PMP certification does not influence successful IT projects as hypothesis H3a was rejected, since the results were not statistically significant.

5.4 PRINCE2 practitioner and failed IT projects

Hypothesis H1b was tested using the *t* test results from Table 5. The 2011 *t* test results show that IT projects failed less on average with PRINCE2 Practitioner certification

Table 4 PMP certification and successful IT projects t tests 2011 and 2013

Successful IT Projects (PMP)			
	2011	2013	Collective
Mean (with certification)	4.71	4.15	4.54
SE (with certification)	0.347	0.507	0.287
Mean (without certification)	4.36	4.07	4.24
SE (without certification)	0.163	0.179	0.012
Mean difference	−0.343	−0.083	−0.306
Confidence interval (lower)	−1.197	−1.108	−0.915
Confidence interval (upper)	0.526	0.874	0.294
Degrees of freedom (df)	773	532	1307
t value (df)	−0.857	−0.146	−0.944
Significance (p)	0.392	0.884	0.345
Effect size (d)	0.084	0.02	0.074

Table 5 PRINCE2 practitioner and failed IT projects t tests 2011 and 2013

Failed IT projects (PRINCE2 practitioner)			
	2011	2013	Collective
Mean (with certification)	1.27	2.09	1.71
SE (with certification)	0.238	0.362	0.226
Mean (without certification)	1.35	0.89	1.17
SE (without certification)	0.065	0.078	0.05
Mean difference	0.074	−1.204	−0.548
Confidence interval (lower)	−0.461	−2.015	−1.042
Confidence interval (upper)	0.531	−0.533	−0.051
Degrees of freedom (df)	773	68.909	129.961
t value (df)	0.305	−3.256	−2.368
Significance (p)	0.761	0.002[a]	0.019[a]
Effect size (d)	−0.046	0.713	0.311

[a] Significant at 95% confidence interval

presence (M = 1.27) than without (M = 1.35). This was not significant (p = 0.761) and implies that PRINCE2 Practitioner presence has no influence on IT project failure. The 2013 t test results show that IT projects failed more with PRINCE2 Practitioner certification presence (M = 2.09) than without (M = 0.89). This was significant (p = 0.002) and implies that PRINCE2 Practitioner presence leads to more failed IT projects. A collective analysis shows that IT projects failed more with PRINCE2 Practitioner certification presence (M = 1.71) than without (M = 1.17). Hypothesis H1b was accepted as the collective results were significant (p = 0.019). Moreover, the implication is that PRINCE2 Practitioner certification negatively influences failed IT projects as the collective

mean results show that more projects fail on average with PRINCE2 Practitioner presence.

5.5 PRINCE2 practitioner and challenged IT projects

The t test results for challenged IT projects with PRINCE2 Practitioner presence are presented in Table 6. Hypothesis H2b was tested using these results. IT projects were more challenged on average with PRINCE2 Practitioner certification presence (M = 3.20) than without (M = 3.07) in 2011. This, however, was not significant (p = 0.769), implying that PRINCE2 Practitioner does not influence challenged IT projects. IT projects were more challenged with PRINCE2 Practitioner certification presence (M = 3.78) than without (M = 2.07) in 2013. This was significant (p = 0.001), implying that PRINCE2 Practitioner presence results in more challenged IT projects. A collective analysis shows that IT projects were more challenged with PRINCE2 Practitioner certification presence (M = 3.51) than without (M = 2.67). The results were significant (p = 0.020) which signifies that hypothesis H2b is accepted. Similar to the failed IT projects results, the implication is that PRINCE2 Practitioner certification negatively influences challenged IT projects as the collective means show that IT projects are more challenged on average with PRINCE2 practitioner presence.

5.6 PRINCE2 practitioner and successful IT projects

The t test results for successful IT projects with PRINCE2 Practitioner presence are presented in Table 7. These

Table 6 PRINCE2 practitioner and challenged IT projects t tests 2011 and 2013

Challenged IT projects (PRINCE2 practitioner)			
	2011	2013	Collective
Mean (with certification)	3.2	3.78	3.51
SE (with certification)	0.497	0.487	0.348
Mean (without certification)	3.07	2.07	2.67
SE (without certification)	0.121	0.111	0.087
Mean difference	−0.135	−1.715	−0.842
Confidence interval (lower)	−1.286	−2.667	−1.539
Confidence interval (upper)	0.87	−0.739	−0.146
Degrees of freedom (df)	773	69.748	132.994
t value (df)	−0.294	−3.436	−2.349
Significance (p)	0.769	0.001[a]	0.020[a]
Effect size (d)	0.04	0.708	0.281

[a] Significant at 95% confidence interval

Table 7 PRINCE2 practitioner and successful IT projects *t* tests 2011 and 2013

Successful IT projects (PRINCE2 practitioner)			
	2011	2013	Collective
Mean (with certification)	4.91	4.08	4.46
SE (with certification)	0.549	0.467	0.358
Mean (without certification)	4.38	4.08	4.26
SE (without certification)	0.153	0.181	0.117
Mean difference	−0.527	0.001	0.2
Confidence interval (lower)	−1.868	−1.06	−1.008
Confidence interval (upper)	0.57	0.973	0.475
Degrees of freedom (*df*)	773	532	1307
t value (*df*)	−0.918	0.001	−0.517
Significance (*p*)	0.359	0.999	0.605
Effect size (d)	0.129	–	0.05

results were used to test hypothesis H3b. IT projects were more successful on average with PRINCE2 Practitioner certification presence (M = 4.91) than without (M = 4.38) in 2011. This, however, was not significant ($p = 0.359$). Interestingly, successful IT projects were the same, on average, with PRINCE2 Practitioner certification presence (M = 4.08) and without (M = 4.08) in 2013 and this was subsequently not significant ($p = 0.999$). A collective analysis shows that successful IT projects were more likely with PRINCE2 Practitioner certification presence (M = 4.46) than without (M = 4.26), but this was not significant ($p = 0.605$). The collective results indicate that hypothesis H3b is rejected and PRINCE2 Practitioner presence therefore has no influence on successful IT projects as there was no statistical significance.

5.7 Correlation analysis of project management certifications and IT project performance

Correlation analysis was the second inferential statistic used to provide further insight into the relationship between project management certifications and IT project performance. A similar approach was adopted when analysing correlations. Both study periods were analysed separately and then a collective analysis was performed. Furthermore, only the PMP and PRINCE2 Practitioner results are reported, since these were the only two with significant results.

PMP was significantly correlated to failed IT projects in 2011, $r = -0.074$, $p = 0.039$. The negative correlation, albeit weak, implies that as PMP presence increases, failed IT projects decrease. Moreover, this result corresponds to

the 2011 *t* test which showed that IT projects failed less with PMP presence and that there was a significant difference between failed IT projects with and without PMP presence. Similarly, PMP was significantly correlated to failed IT projects in 2013, $r = 0.150$, $p = 0.000$. However, the positive correlation implies that as PMP presence increases, failed IT projects increase. This result also corresponds to the 2013 *t* test which showed that IT projects failed more with PMP presence and that there was a significant difference between failed IT projects with and without PMP presence.

PRINCE2 Practitioner was significantly correlated to failed IT projects in 2013, $r = 0.205$, $p = 0.000$. It was also significantly correlated to challenged IT projects, $r = 0.207$, $p = 0.000$. A collective analysis shows that PRINCE2 Practitioner was significantly correlated to failed and challenged IT projects, as the results were $r = 0.087$ ($p = 0.002$) and $r = 0.079$ ($p = 0.004$), respectively. This implies that as PRINCE2 Practitioner presence increases, more IT projects are failures or challenged. These results also correspond to the significant *t* tests which showed that IT projects failed more and were more challenged with PRINCE2 Practitioner presence.

6 Discussion

Project management certification has increased in recent times with the adoption of de facto certifications such as PMP and PRINCE2 Practitioner [11]. PMP and PRINCE2 Practitioner were revealed as the two most prevalent project management certifications in South Africa. The results however do indicate that there was an overall decrease in certification presence as PMP and PRINCE2 combined accounted for 42.4% in 2011 and only 27.9% in 2013. A plausible explanation for the decrease in PMP certifications in particular is that individuals allowed their certifications to lapse and did not recertify themselves. On the other hand, non-certification increased between 2011 (43.3%) and 2013 (59.1%). This contests the notion that there is a movement towards de facto certifications. Furthermore, logic dictates that organisations should certify staff in the project management methodology they employ [71]. The South African landscape opposes this logic and possibly implies that certification is not necessary for IT projects as no value is gained from certification [23]. The decrease in certifications could also be attributed to in-house certification programmes [70].

Prior to formally testing the hypotheses, an initial analysis was done to assess IT project performance based on the

presence of certification (Figs. 4, 5). IT project performance was benefited the most by PMP presence in 2011. Conversely, IT projects performed better in 2013 with no certification present. These results are contradictory and beg the question: why the sudden change? An argument could once again be made that PMP certifications have lapsed and these individuals are still involved albeit without certification. Alternatively, individuals and organisations could be realising that certifications are of no value in reality [16, 18]. Organisations could also be realising that the financial investment of acquiring certification is not justified when further assessing the performance of IT projects.

Six hypotheses were developed to address what influence project management certifications have on IT project performance in South Africa. Hypotheses H1a, H2a and H3a assessed whether failed, challenged and successful IT projects were influenced by PMP presence respectively. All these hypotheses were rejected as they were not significant and thus imply that PMP presence has no influence on IT project performance. Hypotheses H1b, H2b and H3b assessed whether failed, challenged and successful IT projects were influenced by PRINCE2 Practitioner presence respectively. Hypothesis H3b was rejected as it was not significant and implies that PRINCE2 Practitioner presence has no influence on successful IT projects. Conversely, hypothesis H1b and H2b were accepted as the results were significant. The implication is that PRINCE2 Practitioner presence negatively influences failed and challenged IT projects as the results showed that, on average, more projects are failures or challenged when this certification is present. Moreover, this finding is confirmed and validated by the correlation results which imply that that as PRINCE2 Practitioner presence increases, more IT projects are failures or challenged.

It is argued that project management certification provides project managers with the knowledge and skills to perform project activities successfully and realise project success [59, 60]. This assumption is arguably flawed as this paper contradicts the PWC studies [11, 71] and aligns to the study of Starkweather and Stevenson [16] and Wells [18] where the former promotes certification and latter is doubtful. Certifications are assumed to enhance the possibility of project success but the knowledge acquired is arguably insufficient for performing project activities as the programmes are predominantly theoretical in nature and not effectively testing an individual's ability within real-world environments [65]. Furthermore, there is an assumption that once certification is achieved, an

individual is capable of running a project. This paper debunks this assumption and aligns to views of Miller [42] and Catanio et al. [59] who argue acquiring knowledge does not automatically qualify someone as a good project manager. There could be a gap where knowledge does not translate to skills for performing project activities as project managers are not articulating or applying what was learnt in certifications. Alternatively, given that certifications focus primarily on technical skills, this research arguably confirms the notion that there should be more emphasis on soft skills, especially within the IT project management domain [13, 14, 37, 43, 47]. The variation of project performance for each certification could also suggest that IT project management success is more dependent on an individual than certification presence. Certified participants may have also become more complacent with their skills and abilities and thus neglect the important, yet basic, aspects during the project life cycle [73, 74]. Moreover, although it is assumed certification provides generic knowledge and skills which are applicable to any project type, the reality is that certification does not cater for all scenarios [60]. Project management approaches should be adapted to various projects as the concept of 'one size fits all' is flawed. Furthermore, it could be that certification programmes do not accommodate the changing nature of IT and thus produce certified individuals who are unable to cope with IT projects which have become more complex and intricate in recent years [3, 15].

7 Research limitations

There were a number of limitations within this research. Firstly, respondents were not asked if they had some form of in-house certification as this could provide insight into the decrease in formal certifications. Secondly, they were not asked to indicate if they applied the standard or methodology related to their certification. This could help address the notion that certification should be aligned to methodology to realise improved project performance [71]. Thirdly, the survey did not query how much was spent on project management training and certification programmes, organisations could be scaling back financially thus resulting in less certification presence. Finally, the survey did not query organisational project management maturity as this would facilitate further in-depth analysis of the influence of certification on IT project performance at different maturity levels.

8 Conclusions and future outlook

The pursuit of professionalisation in project management has led to the advent of project management certifications. These certifications aim to develop project management competency by focusing on the three constructs of project management competency, viz. knowledge, skills as well as tools and techniques. Hällgren et al. [15] argue that certification does not automatically imply that an individual is capable of managing a project successfully. This research aims to investigate whether the South African IT project performance landscape is comparable or contradictory to previous studies [11, 12, 16, 18, 23].

Firstly, PMP and PRINCE2 Practitioner were identified as the predominant project management certifications. Secondly, deeper analysis of the data revealed that IT project performance was not influenced by project management certification presence. Moreover, PRINCE2 Practitioner presence has a negative influence on failed and challenged IT projects which raises further questions regarding the adoption of project management certifications. This research therefore contradicts the PWC as well as the PMI studies [11, 12], which stated that projects are more likely to succeed when project management certification is present. Moreover, this research confirmed that project management certification is not crucial for improved IT project performance.

Future research should investigate why there has been a decrease in certification and what is influencing this change especially if certification is considered a key criterion for the project management discipline. Furthermore, it must be investigated why IT projects have performed better without certification in recent times as this could help clarify the decrease in certification presence. An investigation into how certification influences project performance at different organisational project management maturity levels is needed to establish whether certification contributes at different maturity levels. Research into PRINCE2 Practitioner certification must be conducted to determine why it is leading to more challenged and failed IT projects than successful IT projects.

Current project management certifications are of no value to IT-related projects. It is therefore recommended that current certification programmes be overhauled and that new pedagogical approaches be adopted to ensure that there is a balance between hard and soft skills required for effective IT project management [2]. Certification programmes should also be adapted for specialisation, viz. allow participants to be project management certified within a particular industry. Organisations could also rather develop and tailor in-house project management programmes for IT projects to ensure that the appropriate project management competency is acquired and applied.

Appendix 1: IT project management maturity

Please read through the following carefully before completing the questionnaire. Project Management Maturity refers to processes, documentation, management and metrics. There are five levels of IT project maturity management as follows:

Maturity Level 5 (Highest)	Optimised processes (All project management processes are in place, measured and continually improved upon)
Maturity Level 4	Managed processes (All project management processes are in place and these are regularly measured)
Maturity Level 3	Organisational standards and institutionalised processes (majority of project management processes are in place and are used by the majority of people)
Maturity Level 2	Structured processes and standards (basic processes are in place and used most of the time)
Maturity Level 1 (Lowest)	Initial process (no or little formal and/or documented processes being used)
N/A	Not applicable or do not know

Please rate each of the following statements according to the above maturity levels.

1. OVERALL LEVEL OF MATURITY	1	2	3	4	5
1.1 In your opinion what is the overall level of IT project management maturity in your organisation?					

2. PROJECT INTEGRATION MANAGEMENT How mature is your organisation in ….	1	2	3	4	5	N/A
2.1 Working with stakeholders in the creation of the project charter.						
2.2 Coordinating planning efforts to create a project management plan.						
2.3 Carrying out the project management plan.						
2.4 Overseeing project work in order to meet the performance objectives of the project.						

2.5 Coordinating changes that affect the project's deliverables.					
2.6 Coordinating changes that affect the organisational process assets.					
2.7 Finalising project activities to formally close the project.					

3. PROJECT SCOPE MANAGEMENT *How mature is your organisation in ….*	1	2	3	4	5	N/A
3.1 Defining and documenting the features and functions of products produced.						
3.2 Defining and documenting the processes needed to create products.						
3.3 Reviewing the project charter.						
3.4 Working with stakeholders in the creation of a project scope statement.						
3.5 Working with users in the creation of a project scope statement.						
3.6 Subdividing the major project deliverables into more manageable components.						
3.7 Formalising acceptance of the project scope.						
3.8 Controlling changes of the project scope.						

4. PROJECT TIME MANAGEMENT *How mature is your organisation in ….*	1	2	3	4	5	N/A
4.1 Identifying the specific activities that the project team members must perform.						
4.2 Identifying the specific activities that the stakeholders must perform.						
4.3 Identifying and documenting the relationships between project activities.						
4.4 Estimating how many resources a project team should use to perform project activities.						
4.5 Estimating the number of work periods that are needed to complete individual activities.						
4.6 Analysing activity sequences in the creation of the project schedule.						
4.7 Analysing activity resource estimates in the creation of the project schedule.						
4.8 Controlling and managing changes to the project schedule.						

5. PROJECT COST MANAGEMENT *How mature is your organisation in ….*	1	2	3	4	5	N/A
5.1 Developing an estimate of the costs of the resources needed to complete a project.						
5.2 Allocating the overall cost estimate to individual work items.						
5.3 Controlling changes to the project budget.						

6. PROJECT QUALITY MANAGEMENT *How mature is your organisation in ….*	1	2	3	4	5	N/A
6.1 Identifying which quality standards are relevant to the project.						
6.2 Evaluating overall project performance to meet the relevant quality standards.						
6.3 Monitoring specific project results to ensure that they comply with the relevant quality standards.						

7. PROJECT HUMAN RESOURCE MANAGEMENT *How mature is your organisation in ….*	1	2	3	4	5	N/A
7.1 Identifying and documenting project roles and responsibilities.						
7.2 Getting the needed personnel to work on the project.						
7.3 Building individual skills to enhance project performance.						
7.4 Building group skills to enhance project performance.						
7.5 Tracking team member performance.						
7.6 Providing timely feedback.						
7.7 Resolving issues and conflicts to help enhance project performance.						

8. PROJECT COMMUNICATIONS MANAGEMENT *How mature is your organisation in ….*	1	2	3	4	5	N/A
8.1 Identifying everyone involved in or affected by the project (stakeholders)						
8.2 Managing relationships with stakeholders						
8.3 Determining the information and communications needs of the stakeholders.						
8.4 Making information available to project stakeholders in a timely manner.						
8.5 Managing communications to satisfy the needs and expectations of project stakeholders.						
8.6 Collecting and disseminating status reports.						
8.7 Collecting and disseminating progress measurement.						
8.8 Collecting and disseminating forecasting.						

9. PROJECT RISK MANAGEMENT *How mature is your organisation in ….*	1	2	3	4	5	N/A
9.1 Deciding how to plan the risk management activities for the project.						
9.2 Determining which risks are likely to affect a project.						
9.3 Documenting the characteristics of each risk.						
9.4 Prioritising risks based on their probability.						
9.5 Prioritising risks based on their impact of occurrence.						
9.6 Numerically estimating the effects of risks on project objectives.						
9.7 Taking steps to reduce threats to meeting project objectives.						
9.8 Monitoring residual risks.						
9.9 Identifying new risks.						
9.10 Carrying out risk response plans.						
9.11 Evaluating the effectiveness of risk strategies throughout the life of the project.						

10. PROJECT PROCUREMENT MANAGEMENT *How mature is your organisation in ….*	1	2	3	4	5	N/A
10.1 Planning purchases and acquisitions.						
10.2 Identifying potential contractors or suppliers.						
10.3 Requesting proposals from sellers.						
10.4 Choosing from among potential suppliers through a process of negotiation.						
10.5 Managing the relationship with the selected seller.						
10.6 Monitoring contract performance.						
10.7 Completing and settling each contract.						

Appendix 2: Project success and failure issues

11. PROJECT INVOLVEMENT

11.1	In the past **2 years**, how many projects have you been involved in? (please give a number)	
11.2	Of these projects how many:	
11.2.1	Have **failed?** *(A failed project is a project that is never completed or does not meet customer requirements. It delivers very little value or no value at all.)*	
11.2.2	Were **challenged?** *(A challenged project is a project that is completed, but is either late, over-budget or does not meet all the requirements. It delivers moderate value, less than what was anticipated.)*	
11.2.3	Were **successful?** *(A successful project is a project that is delivered on time, within budget, within scope and complies with the quality requirements. It delivers strong value, the expected value)*	

12. WHAT WAS THE SIZE OF THE LAST <u>FAILED</u> PROJECT? (Select only one)

12.1	Very Small	
12.2	Small	
12.3	Large	
12.4	Very Large	
12.5	Not Applicable (Please continue to Question 15)	

13. IN WHAT INDUSTRY WAS THE LAST <u>FAILED</u> PROJECT? (Please indicate all the industries)

13.1	Information and Communications Technology (ICT)	
13.2	Finance and Banking	
13.3	Energy and Utilities	
13.4	Government & Public Sector (National, Provincial or Local)	
13.5	Manufacturing	
13.6	Transport	
13.7	Retail and Wholesale	
13.8	Construction and Civil Engineering	
13.9	Consulting or professional services	
13.10	Other (please specify below)	

14. PLEASE INDICATE WHICH OF THE FOLLOWING FACTORS CONTRIBUTED TO PROJECT FAILURE. (Make an **X** next to ALL the factors indicating the importance of the factor)

		Not at all Important	Slightly Important	Neutral	Somewhat Important	Very Important	Not sure
14.1	Inadequate handling of change						
14.2	Lack of communication between team & customers						
14.3	Lack of communication between Project team members						
14.4	Lack of project manager competency						
14.5	Minimal support of innovative technology						
14.6	Inadequate user understanding of technology						
14.7	Lack of executive support						
14.8	Unclear business objectives						
14.9	Misunderstanding of user's needs						
14.10	Unclear requirement definition						
14.11	Lack of user involvement						
14.12	Inadequate change control processes						
14.13	Inappropriate formal methodologies						
14.14	Incorrect auditing of processes						
14.15	Other (Please list below)						

15. WHAT WAS THE SIZE OF THE LAST CHALLENGED PROJECT? (Select only one)

15.1	Very Small	
15.2	Small	
15.3	Large	
15.4	Very Large	
15.5	Not Applicable (Pease continue to Question 18)	

16. IN WHAT INDUSTRY WAS THE LAST CHALLENGED PROJECT? (Please indicate the industry by making an **X** in the relevant column)

16.1	Information and Communications Technology (ICT)	
16.2	Finance and Banking	
16.3	Energy and Utilities	
16.4	Government & Public Sector (National, Provincial or Local)	
16.5	Manufacturing	
16.6	Transport	
16.7	Retail and Wholesale	
16.8	Construction and Civil Engineering	
16.9	Consulting or professional services	

16.10	Other (please specify below)	

17. PLEASE INDICATE WHICH THE FOLLOWING FACTORS CONTRIBUTED TO PROJECT BEING <u>CHALLENGED</u>. (Make an **X** next to ALL the factors indicating the importance of the factor)

		Not at all Important	Slightly Important	Neutral	Somewhat Important	Very Important	Not sure
17.1	Inadequate handling of change						
17.2	Lack of communication between team & customers						
17.3	Lack of communication between Project team members						
17.4	Lack of project manager competency						
17.5	Minimal support of innovative technology						
17.6	Inadequate user understanding of technology						
17.7	Lack of executive support						
17.8	Unclear business objectives						
17.9	Misunderstanding of user's needs						
17.10	Unclear requirement definition						
17.11	Lack of user involvement						
17.12	Inadequate change control processes						
17.13	Inappropriate formal methodologies						
17.14	Incorrect auditing of processes						
17.15	Other (Please list below)						

18. WHAT WAS THE SIZE OF LAST <u>SUCCESSFUL</u> PROJECT? (Select only one)

18.1	Very Small	
18.2	Small	
18.3	Large	
18.4	Very Large	
18.5	Not Applicable (Please continue to Question 21)	

19. IN WHAT INDUSTRY WAS THE LAST <u>SUCCESSFUL</u> PROJECT? (Please indicate the industry by making an **X** in the relevant column)

19.1	Information and Communications Technology (ICT)	
19.2	Finance and Banking	
19.3	Energy and Utilities	

19.4	Government & Public Sector (National, Provincial or Local)	
19.5	Manufacturing	
19.6	Transport	
19.7	Retail and Wholesale	
19.8	Construction and Civil Engineering	
19.9	Consulting or professional services	
19.10	Other (please specify below)	

20. PLEASE INDICATE WHICH THE FOLLOWING FACTORS CONTRIBUTED TO PROJECT BEING SUCCESSFUL. (Make an **X** next to ALL the factors indicating the importance of the factor)

		Not at all Important	Slightly Important	Neutral	Somewhat Important	Very Important	Not sure
20.1	Adequate handling of change						
20.2	Good communication between team & customers						
20.3	Good communication between Project team members						
20.4	Adequate project manager competency						
20.5	Maximum support of innovative technology						
20.6	Adequate user understanding of technology						
20.7	Positive executive support						
20.8	Clear business objectives						
20.9	Good understanding of user's needs						
20.10	Clear requirements definition						
20.11	Frequent user involvement						
20.12	Adequate change control processes						
20.13	Appropriate formal methodologies						
20.14	Correct auditing of processes						
20.15	Other (Please list below)						

21. HOW DO YOU DEFINE PROJECT SUCCESS IN YOUR ORGANISATION? (Select ALL applicable to project success)

21.1	Triple Constraint (Time, Cost, Scope)	
21.2	Quadruple Constraint (Time, Cost, Scope, Quality)	
21.3	Delivery of business benefits	
21.4	Met project requirements	
21.5	User Satisfaction	
21.6	Sponsor Satisfaction	

21.7	Steering Group Satisfaction	
21.8	Stakeholder Satisfaction	
21.9	System Implementation	
21.10	System use	
21.11	Met business objectives	
21.12	Other (Please list below)	

Appendix 3: Other information

22. EMPLOYMENT (Please indicate by making an **X** next to the relevant statement)

22.1	*Employed by a company / organisation / government who do internal projects*	
22.2	*Self employed*	
22.3	*Self employed / Independent consultant*	
22.4	*Employed by a consulting company / organisation who do external projects for clients*	
22.5	*Other*	

23. POSITION / ROLE / JOB TITLE (Please indicate by making an **X** in the relevant column)

23.1	Assistant Project Manager	
23.2	Project Coordinator	
23.3	Project Manager	
23.4	Senior Project manager	
23.5	Project Leader / Project Team Leader	
23.6	Program Manager	
23.7	Portfolio Manager	
23.8	Project Implementation Manager	
23.9	IT manager	
23.10	Business Analyst	
23.11	Project management consultant	
23.12	Other (Please specify)	

24. BIOGRAPHICAL (Please indicate by making an **X** in the relevant column)

24.1	**Gender**	*Prefer not to say*		*Female:*		*Male:*	
24.2	**Age Group**	*Prefer not to say*		*Younger than 20*		*20 – 29*	
		30 – 39		*40 – 49*		*50 - 59*	
		60 or older					
24.3	**Race**	*Prefer not to say*		*African*		*Asian*	
		Coloured		*Indian*		*White*	
		Other					

25. PROJECT MANAGEMENT CERTIFICATION (Please provide following information about yourself. Please indicate by making an **X** next to the relevant certification)

25.1	None	
25.2	PMP from PMI	
25.3	CAPM from PMI	
25.4	PgMP from PMI	
25.5	Prince 2 Practitioner	
25.6	Certificated Project Manager (IPMA Level B) from IPMA	
25.7	Practitioner Qualification (IPMA Level C) from IPMA	
25.8	APMP (IPMA Level D) from IPMA	
25.9	IT Project+ from CompTIA	
25.10	APMC from IIL	
25.11	CPM from IAPMM	
25.12	Other (please specify)	

Thank you for your valuable time.

OPTIONAL INFORMATION (Only complete the following if you would be willing to assist us with a short follow-up interview)

Name and Surname	
Company name	
Department / Division	
Email address	
Telephone number	
Cell number	

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