DETERMINATS OF SUCCESSFUL PROJECT MANAGEMENT IN THE TRANSFORMER MANUFACTURING INDUSTRY OF GAUTENG PROVINCE

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Abstract: The study was conducted in the electrical power industry of Gauteng Province, South Africa in order to assess and evaluate the efficiency with which projects are completed by project managers. The study was based on data collected from a random sample of size 147 project managers working in the power industry of Gauteng Province. Quantitative data was collected from 147 employees of Zest Weg Transformers Africa by using a structured questionnaire of study. Qualitative data was collected from 12 project managers by conducting 1-hour-long individual in-depth interviews. Quantitative data was collected using a validated and structured questionnaire. Quantitative data analyses were performed using statistical procedures such as frequency tables, bivariate analysis, and ordered logit regression analysis. The ability to complete a project successfully was defined by using criteria stipulated by Larson and Gray (2016). The study found that 95% of the 147 employees had failed at least once in the past in the completion of designated projects. Based on results obtained from ordered logit regression analysis, the successful completion of projects was significantly influenced by 5 factors. These 5 factors were: the duration of experience of working in project management, age, duration of employment, level of education and the availability to clearly define the goals and directions of projects. Similar results were obtained from in-depth interviews conducted with 12 project managers working in the company. A framework was constructed based on findings obtained from the study for enhancing the ability of employees to manage their projects more efficiently.

Keywords: Gauteng Province, Power industry, Project management, Efficiency, Ordered logit regression

Introduction and background to study

The study aims to assess and evaluate determinants of successful project management in the power transformer industry of Gauteng Province in South Africa. Since 2010, the South African power utility company ESKOM has suffered lack of capacity to generate enough electrical power to the South African economy due to lack of capacity to manufacture enough number of power transformers (Larsen & Hansen, 2020). ESKOM has suffered a significant loss of qualified experts, electrical engineers, architects, power generation specialists and project managers due to lack of leadership and strategic planning (Ateba, Prinsloo & Gawlik, 2019: 1328). As a result, ESKOM is losing overall productivity due to lack of transformers (Singh & Swanson, 2018: 164). There is a shortage of studies that could be used for ensuring the successful completion of projects in the transformer manufacturing enterprise (Pinheiro, Wimmer, O'Donnell, Muhic, Bazjanac, Maile & Van Treeck, 2018: 96). The study has the potential for making a meaningful contribution to knowledge by way of collecting empirical data from all employees of the power utility company on factors that affect the ability of employees of the company to complete projects within time and budget without lowering quality standards. A project is said to be successfully completed if it is completed within budget and time without lowering quality specifications (Kerzner, 2019: 43). The South African transformer manufacturing industry plays a critical role in the generation and distribution of electrical power (Chari & Agrawal, 2018: 169).

The ability of South African transformer manufacturing enterprises is a key requirement for the generation and distribution of adequate and reliable electrical power by power utility companies such as ESKOM (Gunduz & Yahya, 2018: 68). Gauteng Province is home to most transformer manufacturing enterprises in South Africa. In the past two decades, the South African transformer manufacturing sector has suffered a significant loss of qualified experts, electrical engineers, architects, power generation specialists and project managers due to lack of leadership and strategic planning (Ateba, Prinsloo & Gawlik, 2019: 1328). The sector is currently experiencing an acute shortage of adequately experienced specialists who can be used for ensuring the successful completion of projects (Singh & Swanson, 2018: 164). The key acquaintance, abilities, competences, such as characteristics of leadership

moreover management promote project success whilst also manufacture appropriate determinations now at opportune moment but also utilizing this same appropriate people mostly in appropriate locations (Yukl, 2012).

The aim of study was to assess and evaluate the degree to those which projects are managed efficiently in the power transformer industry of South Africa. The industry is a key supplier to the South African power utility company ESKOM. The enterprise has lost specialised technical skills and expertise in the past two decades. There is a shortage of studies that could be used for ensuring the successful completion of projects in the transformer manufacturing enterprise (Pinheiro, Wimmer, O'Donnell, Muhic, Bazjanac, Maile & Van Treeck, 2018: 96). Transformer manufacturing facilities should meet ISO 9001-2008 quality assurance standards, ISO 14001-2004 environmental standards, as well as OSHAS 18001-2007 health and safety standards.

Findings obtained from this study have the potential for enabling the transformer manufacturing enterprise to enhance its overall productivity and success in the successful completion of projects on which the power utility ESKOM depends for power generation and distribution. The transformer manufacturing industry faces numerous project management issues on both the technical and administrative fronts. To begin with, there are only few available empirical research on project management accomplishment in South Africa, leaving no documentation on best practices in the industry. Second, while all projects have hurdles in terms of implementation and, as a result, success, development initiatives are afflicted by a distinct set of problems and challenges. Omogoye, Folly and Awodele (2021) have shown that the South African power industry is losing talented electrical engineers at an alarming rate due to lack of motivation and incentives for highly skilled engineers. The authors have shown that the costs of projects have increased sharply due to shortage of specialised skills in the power industry. The cost of projects, communication skills, cooperation, stakeholder satisfaction and good leadership skills are shown to be highly valuable for ensuring the successful completion of projects in the South African power industry. The authors have argued that the successful completion of transformer manufacturing projects is a key indicator of the ability of ESKOM to generate enough electrical power to the South African economy. Mirzania, Balta-Ozkan and Marais (2020:1-13) have shown that sufficient adherence to the ten fundamental principles of project management (PMBOK principles) by employees working in the power transformer manufacturing industry of South Africa is an influential predictor of efficiency and productivity.

Objective of study

The study aims to assess and evaluate determinants of successful project management in the power transformer industry of Gauteng Province in South Africa. Since 2010, the South African power utility company ESKOM has suffered lack of capacity to generate enough electrical power to the South African economy due to lack of capacity to manufacture enough number of power transformers. The study aims to identify and quantify predictors of efficiency in the power transformer-manufacturing sector of Gauteng Province.

Literature review

Although there are a few transformer-manufacturing enterprises in Cape Town and Durban, Gauteng Province is home to most transformer manufacturing enterprises. South African transformer manufacturing companies are required by law to comply with the highest industrial quality standards in the world. In the past two decades, the Gauteng-based South African transformer manufacturing sector has suffered a significant loss of qualified experts, electrical engineers, architects, power generation specialists and project managers due to lack of leadership and strategic planning (Ateba, Prinsloo & Gawlik, 2019: 1328). The South African transformer manufacturing industry is currently experiencing an acute shortage of adequately experienced specialists who could be used for ensuring the successful completion of projects (Singh & Swanson, 2018: 164). Due to lack of specialised technical skills and expertise, projects that are essential for the generation and distribution of electrical power are being left incomplete at a growing rate and frequency (Haes Alhelou, Hamedani-Golshan, Njenda & Siano, 2019: 682).

Hasan, Hossain, Tuhin, Sakib & Thollander (2019: 2671) have shown that the transformer manufacturing sector undergoes frequent technological innovation, progressing consumer demands, and a need to enhance infrastructure needs and leeway are all causing distress and evolution on various fronts. Nationally and internationally, hydropower is increasing. However, majority of the world's largest power companies that are using metallurgical coal as such a fuel source are losing money. Traditional, one-directional methods of energy production are undergoing massive changes due to the introduction of decentralised, decarbonised, and digitalised systems of electrical power

generation and distribution. The introduction of smart grids has disrupted traditional methods of power distribution (Maka & Aliber, 2019: 39). Operational expenditure on traditional power generation and distribution methods has now become unaffordable to consumers. As a result, the power industry is under constant pressure to use highly efficient power transformers as a means of ensuring efficiency. ESKOM invests heavily on the manufacture of power transformers and distributors. In this regard, the success achieve by ESKOM is dependent upon the ability of ESKOM to acquire highly efficient and affordable power transformers from transformer manufacturing companies (Yadav, Khandelwal, Jain & Mittal, 2019: 17). The institution has enough financial resources to promote innovative skills that are helpful for the efficient manufacture of affordable power transformers. These talents are also necessary for agriculture, construction, industry, energy, and mining to achieve long-term growth and development. The transformer manufacturing business is a high-tech environment with opportunities for skill development. Manufacturing high-quality, dependable windings is a specialized craft that necessitates a high level of dedication. Collaborations besides on-site training institutes and MErSETA (Manufacturing, Engineering, and Related Services Sector Education Training Authority) remain assisting in those developments of these critical skills.

De Oliveira, Luna, & Campos (2019: 564) have shown that Brazil has managed to enhance its overall power generation capacity by investing heavily in its transformer manufacturing sector. According to the authors, Brazil has gained significantly in terms of expanding its skills base for clean energy production by investing in its transformer manufacturing sector. Haes Alhelou, Hamedani-Golshan, Njenda & Siano (2019: 568) have shown that failure to invest in the transformer manufacturing sector is a common cause of loss of power generation capacity in developing nations such as South Africa. Aleem, Winberg, Iqbal, Al-Hitmi & Hanif (2019: 8434) have shown that it is possible to build capacity for clean production by investing in the manufacture of power transformers. Technological innovations, increasing customer requirements, as well as the need to enhance infrastructure needs and leeway are causing disruption and transition in the energy industry on numerous fronts. Renewable energy generation is increasing, even though nearly portion of the world largest power companies using current ember as a feedstock are believed to be losing money. Those energy businesses is confronted with challenges to the traditional one-directional production, transmission, and distribution of energy, as well as the transition of devolved, two different methods, as well as digitally mastered efficiency infrastructures. The smart grids growth is putting pressure on industry behemoths while also enabling again for entrance of international venture capitalists, builders, companies, as well as software vendors into the industry.

In the South African transformer manufacturing industry, intellectually capable team players are essential for the successful completion of projects. Vital projects are often delayed in the South African power industry due to lack of adequately skilled and experienced project managers and electrical engineers. Bjorvatn & Wald (2018: 878) have argued that technical employees must be recruited based on verifiable professional competence and proven track record. Failure to do so results in failure to complete projects successfully. When there is a shortfall in the project team, project managers risk failure. As a result, project managers must assign the appropriate work to the appropriate team member based on objective proof of professional competence and intellect. Kezner (2019: 63) emphasizes the importance of comprehensive planning as a prerequisite for project completion. For projects to be completed successfully, the capacity to generate effective planning is required. In a comprehensive plan, all characteristics of the project that must be addressed implemented are articulated. Bjorvatn & Wald (2018: 879) have pointed out that the complexity of projects can only be managed adequately by producing a sound project plan that prepares all team members for all possible scenarios. Having a detailed plan at the point of start is a mandatory trait for the success concerning projects. All project team members and stakeholders should be aware of the project's direction from the start. Holistic planning can help the team fulfil important timeframes while maintaining established. Sound planning allows a realistic time frame for activities. Accurate time estimates allow the project manager to accurately estimate the project's cost. This ability enables project leaders to meet key milestones and deliverables within time and budget without lowering quality standards.

Open communication and transparency among all team members is a significant requirement for this successful project completion (Nazarko, 2017: 54). An open communication channel is essential for allowing the free flow of ideas, suggestions, and valuable comments. Failure to communicate openly with every member of the project team leads to confusion, loss of time and project money, lack of clear understanding and loss of morale at the workplace. Open communication is always essential for informing stakeholders (Varajao, Colomo-Palacios & Silva, 2017: 219). It is always necessary and vital to keep stakeholders informed about successes and failures that are experienced during project implementation. Doing so allows stakeholders to be part of solutions. It also helps to minimise the likelihood of costly litigation.

According to Muriana & Vizzini (2017: 322) project risk management is an important aspect of project management requirements. This is because projects do not always proceed according to plan. Unforeseen factors cause some undertakings to fail. Thus, project managers must plan for every possible scenario including a scenario for failure. The ability to manage and plan for potential risk enables project managers to save valuable resources at times of crisis.

The importance of sticking to the project plan has been demonstrated by Aragones-Beltran, Garcia-Melon, & Montesinos-Valera (2017: 456). A competent project manager follows the project plan at all stages of the project. A good project manager, according to Silvius, Kampinga, Paniagua, & Mooi (2017: 1137) follows the project plan during implementation all of the crucial success elements have been reached, according to the client. Lack of adherence to project plans results in the loss of project quality. It also escalates the cost-of-service delivery and the time needed for completing projects. According to Al-Kadeem, Backar, Eldardiry, & Haddad (2017: 55), project managers must stick to their key performance indicators (KPIs) and key performance areas (KPAs) to ensure overall success, project quality, project scope, budget, schedule, and operational requirements of stakeholders. Good project managers ensure adequate compliance with the ten knowledge areas of excellent project management. Among these knowledge domains are integration, scope, time, cost, quality, human resource, procurement, effective communication, risk management, and stakeholder management.

A project manager's effectiveness is determined by a variety of special situations and team characteristics; thus, defining It is inconceivable to devise an integrated management (Mabelo, 2020). Nevertheless, in Project management: The managerial Process, Larson & Gray (2014) define a number of eight critical characteristics which they presume can contribute to project management achievement: (1) just becoming a typically a major, (2) possessing moral dignity, (3) becoming assertive, (4) experiencing a significant emotional maturity, (5) having a broad sense business point of view, (6) utilizing good time management skills, (7) being a good campaigner, and (8) being an extrovert. The importance of a project manager's ability to stand the walk is emphasized by Larson & Gray (2014). Project managers' leadership styles, behavior, as well as perceptions are extremely crucial because their daily actions impact the lives and success of their team members.

Wright and Hastak (2014: 404) and Abylova, Turemuratov and Bekbosynova (2019) have shown that good leadership is essential for ensuring the successful completion of projects in the South African transformer manufacturing sector by way of adhering to the ten fundamental principles of project management published by the Project Management Institute (PMI). Al-Hajj and Zraunig (2018: 23) have pointed out that all ten principles (commonly referred to as PMBOK principles) are related to leadership skills and quality. These ten PMBOK principles are also known as project management body of knowledge principles. ESKOM is a key stakeholder in the South African energy production and distribution sector. Failure to complete projects successfully often undermines the ability of ESKOM to provide uninterrupted power supply. Local industries, municipalities, repair and maintenance operators, individual households, private enterprises, hospitals, schools, shopping malls, mines, manufactures, suppliers, distributors, banks, retailers and workshops are put out of service due to frequent power outages (Aleem, Winberg, Iqbal, Al-Hitmi & Hanif, 2019: 8434).

Methods and materials of study

The design of study was descriptive and cross-sectional. Quantitative methods of data analyses will be used in the study. According to Bryman and Bell (2015), a descriptive study design is suitable for an exploratory study of this kind. The sample size of study was equal to 147. These were highly skilled and well-experienced electrical engineers and technicians working in the electrical transformer manufacturing industry of Gauteng Province. Data was collected from respondents by using a structured, pre-tested and validated questionnaire of study. Content validity was ensured by conducting a pilot study before the actual study was carried out (Hair, Black, Babin & Anderson, 2013). A structured questionnaire is ideal for gathering information from respondents effectively without introducing bias. The questionnaire of study was pre-tested before it was used to ensure content validity. Cronbach Alpha tests were used for ensuring reliability and internal consistency (Ritchie, Lewis, Nicholls & Ormston, 2013). Quantitative data analyses were done by using univariate, bivariate and multivariate methods of data analyses. These were frequency tables, crosstab analyses (Hair, Black, Babin & Anderson, 2013) and ordered logit analysis (Hosmer Jr, Lemeshow & Sturdivant, 2013).

Results of data analyses

Table 1 shows frequency counts and percentages for various personal characteristics of respondents. About 12% of respondents were 30 years old or younger. The percentage of respondents who were 31 to 35 years old was 20.41%. The percentage of respondents who were 36 to 40 years old was 31.29%. The percentage of respondents who were 41 to 50 years old was 29.25%. The percentage of respondents who were 51 to 60 years old was 7.48%. About 17% of respondents had Grade 12 level qualifications or less. About 26% of respondents had certificates. About 28% of respondents had diplomas. About 18% of respondents had Bachelor' degrees. About 9% of respondents had Honour's degrees. Only 3 of the 147 respondents (2.04%) had Master's degrees. About 34% of respondents were female, whereas about 66% of respondents were male. Black employees accounted for 67.35% of employees. Coloured employees accounted for 13.61% of employees. Indian employees accounted for 11.56% of employees. White employees accounted for 7.48% of employees.

Table 1: General characteristics of respondents (n=147)

Characteristic	**Number of respondents and percentage**
Age category of respondents in years	30 or less: 17 (11.56%) 31 to 35: 30 (20.41%) 36 to 40: 46 (31.29%) 41 to 50: 43 (29.25%) 51 to 60: 11 (7.48%)
Educational level of respondents	Grade 12 or less: 25 (17.01%) Certificate: 38 (25.85%) Diploma: 41 (27.89%) Bachelor' degree: 27 (18.37%) Honour's degree: 13 (8.84%) Master's degree: 3 (2.04%)
Gender of the respondents	Female: 50 (34.01%) Male: 97 (65.99%)
Race group of respondent	Black: 99 (67.35%) White: 11 (7.48%) Coloured: 20 (13.61%) Indian: 17 (11.56%)

Table 2 shows frequency counts and percentages for the duration of employment of respondents. The table also shows frequency counts and percentages for the duration of experience of respondents in the management of projects in the company. The percentage of respondents with 5 years of service or less was 12.24%. The percentage of respondents with 6 to 10 years of experience was 34.69%. The percentage of respondents with 11 to 15 years of experience was 29.25%. The percentage of respondents with 16 to 20 years of experience was 17.69%. The percentage of respondents with 21 years of experience or more was 6.12%. The table shows that the durations of employments of respondents were fairly similar to the durations of their experience as project managers in the company.

Table 2: Durations of employments of respondents (n=147)

Characteristic	**Number of respondents and percentage**
Duration of employment at Zest Weg Transformers Africa	5 years or less: 18 (12.24%) 6 to 10 years: 51 (34.69%) 11 to 15 years: 43 (29.25%) 16 to 20 years: 26 (17.69%) 21 years or more: 9 (6.12%)
Duration of experience as a project manager at Zest	Less than 3 years: 7 (4.76%)

Weg Transformers Africa	3 to 5 years: 12 (8.16%) 6 to 10 years: 52 (35.37%) 11 to 15 years: 43 (29.25%) 16 to 20 years: 24 (16.33%) 21 years or more: 9 (6.12%)

According to Larson and Gray (2016) and Verzuh (2015), a project is said to be successfully completed when the entire scope of project is completed within time and cost without lowering quality standards. According to the authors, the overall efficiency of project managers can be objectively assessed by using 4 distinct dimensions. These 4 dimensions are the following:

1. Ability to complete projects successfully according to plan
2. Ability to have impact on customers
3. Ability to conduct business profitably now
4. Ability to prepare adequately for conducting business in future

Table 3 assesses the perception held by the 147 respondents of study on their ability to complete projects successfully according to plan at the workplace on a daily basis. Responses obtained from respondents are measured by using a 5-point ordinal scale in which the number 1 denotes the lowest degree of agreement, whereas the number 5 denotes the highest degree of agreement with the statement provided. That is,

1. Strongly disagree (SD)
2. Disagree (D)
3. Not sure (NS)
4. Agree (A)
5. Strongly agree (SA)

Table 3: Ability to complete projects successfully according to plan (n=147)

Perception about own ability to complete projects successfully	SD	D	NS	A	SA
The project was completed on time (C1)	3.40%	6.80%	10.20%	58.50%	21.09%
The project was completed according to the budget allocated (C2)	4.76%	6.80%	9.52%	57.14%	21.77%
Creating opportunities for sharing of feelings among the project team (C3)	3.40%	6.12%	10.20%	58.50%	21.77%
Clarifying role expectations of each team member (C4)	6.12%	6.80%	10.20%	57.14%	19.73%
The outcome of the project has directly benefited the intended end users, either through increasing efficiency or effectiveness (C5)	4.76%	6.12%	10.20%	57.14%	21.77%
Given the problem for which it was developed, the project seems to do the best job of solving that problem (C6)	4.76%	6.80%	10.20%	57.82%	20.41%
I was satisfied with the process by which the project was implemented (C7)	0.68%	6.80%	10.20%	58.50%	23.81%
The project has directly led to improved performance for the end users/target beneficiaries (C8)	0.68%	6.80%	10.20%	58.50%	23.81%
Project team members were satisfied with the process by which the project was implemented (C9)	2.04%	6.80%	10.20%	58.50%	22.45%
The project had no or minimal start-up problems because it was readily accepted by its end users	0.68%	6.80%	10.20%	58.50%	23.81%

(C10)					
The project has made a visible positive impact on the target beneficiaries (C11)	2.04%	6.80%	10.20%	58.50%	22.45%
Project specifications were met by the time of handover to the target beneficiaries (C12)	0.68%	6.80%	10.20%	58.50%	23.81%
The target beneficiaries were satisfied with the outcomes of the project (C13)	2.04%	6.80%	10.20%	57.82%	23.13%
Our principal donors were satisfied with the outcome of the project implementation (C14)	8.16%	6.80%	57.14%	24.49%	3.40%

The table provides percentages for 14 indicators of the ability of respondents to complete projects successfully. It can be seen from the table that the respondents by and large are capable of completing projects successfully according to plan.

Table 4 assesses the perception held by the 147 respondents of study on their ability to have impact on customers. Responses obtained from respondents are measured by using a 5-point ordinal scale in which the number 1 denotes the lowest degree of agreement, whereas the number 5 denotes the highest degree of agreement with the statement provided. That is,

1. Strongly disagree (SD)
2. Disagree (D)
3. Not sure (NS)
4. Agree (A)
5. Strongly agree (SA)

Table 4: Ability to have impact on customers (n=147)

Perception about own ability to have impact on customers	SD	D	NS	A	SA
The leader is self-aware of his or her own feelings and is able to recognise and control them adequately enough (B1)	3.40%	6.80%	10.20%	58.50%	21.09%
The leader uses his or her self-control to increase the success of projects (B2)	4.76%	6.80%	9.52%	57.14%	21.77%
The leader adequately motivates team members in order to complete projects successfully (B3)	3.40%	6.12%	10.20%	58.50%	21.77%
The leader uses vision and imagination in the course of project implementation (B4)	6.12%	6.80%	10.20%	57.14%	19.73%
The leader identifies both opportunities and threats in the course of project planning (B5)	4.76%	6.12%	10.20%	57.14%	21.77%
The leader coordinates resources needed for project implementation efficiently (B6)	4.76%	6.80%	10.20%	57.82%	20.41%
The project manager delegates tasks to fellow team members with a view to promote the mastery of technical skills (B7)	0.68%	6.80%	10.20%	58.50%	23.81%
The project manager gathers relevant information from a wide range of sources by probing facts in which advantages and disadvantages are clearly identified (B8)	0.68%	6.80%	10.20%	58.50%	23.81%
The leader is a hard worker who shows consistent performance in various situations (B9)	2.04%	6.80%	10.20%	58.50%	22.45%

The leader is prepared to learn from fellow team members as long as doing so is helpful for the successful implementation of projects (B10)	0.68%	6.80%	10.20%	58.50%	23.81%
The leader promotes awareness about new ideas and helpful concepts at all times (B11)	2.04%	6.80%	10.20%	58.50%	22.45%
The leader always consults adequately with fellow team members before taking important decisions that are related to the scopes of projects (B12)	0.68%	6.80%	10.20%	58.50%	23.81%
The leader shows enough commitment to listen to fellow team members in circumstances when consultation is necessary (B13)	2.04%	6.80%	10.20%	57.82%	23.13%
The leader encourages team-members to work together and share ideas on challenging tasks, roles and responsibilities (B14)	8.16%	6.80%	57.14%	24.49%	3.40%
The leader uses creativity to solve practical problems (B15)	1.36%	6.80%	11.56%	57.14%	23.13%

The table provides percentages for 15 indicators of the ability of respondents to have impact on customers on a daily basis. It can be seen from the table that the respondents by and large are capable of having impact on customers.

Table 5 assesses the perception held by the 147 respondents of study on their ability to conduct business profitably now. Responses obtained from respondents are measured by using a 5-point ordinal scale in which the number 1 denotes the lowest degree of agreement, whereas the number 5 denotes the highest degree of agreement with the statement provided. That is,

1. Strongly disagree (SD)
2. Disagree (D)
3. Not sure (NS)
4. Agree (A)
5. Strongly agree (SA)

Table 5: Ability to conduct business profitably now (n=147)

Perception about own ability to conduct business profitably now	SD	D	NS	A	SA
Poorly defined project goals (D1)	6.12%	6.80%	10.20%	57.14%	19.73%
Low level of skills among team members (D2)	4.76%	6.12%	10.20%	57.14%	21.77%
Ineffective communication among team members (D3)	4.76%	6.80%	10.20%	57.82%	20.41%
Poor ability in risk assessment (D4)	0.68%	6.80%	10.20%	58.50%	23.81%
Inability to meet deadlines (D5)	0.68%	6.80%	10.20%	58.50%	23.81%
Running out of resources prematurely (D6)	2.04%	6.80%	10.20%	58.50%	22.45%
Ambiguous contingency plans (D7)	0.68%	6.80%	10.20%	58.50%	23.81%
Lack of accountability among team members (D8)	2.04%	6.80%	10.20%	58.50%	22.45%
Sudden change in scope of project (D9)	0.68%	6.80%	10.20%	58.50%	23.81%
Failure to communicate with stakeholders effectively (D10)	2.04%	6.80%	10.20%	57.82%	23.13%
Failure to meet expectations of stakeholders (D11)	8.16%	6.80%	57.82%	23.81%	3.40%

The table provides percentages for 11 indicators of the ability of respondents to conduct business now. It can be seen from the table that the respondents by and large are capable of doing business now.

Table 6 assesses the perception held by the 147 respondents of study on their ability to prepare adequately for conducting business in future. Responses obtained from respondents are measured by using a 5-point ordinal scale in which the number 1 denotes the lowest degree of agreement, whereas the number 5 denotes the highest degree of agreement with the statement provided. That is,

1. Strongly disagree (SD)
2. Disagree (D)
3. Not sure (NS)
4. Agree (A)
5. Strongly agree (SA)

Table 6: Ability to prepare adequately for conducting business in future (n=147)

Perception about own ability to prepare adequately for conducting business in future	SD	D	NS	A	SA
Compliance with the planned budget, time frame and performance criteria (E1)	1.36%	6.80%	11.56%	57.14%	23.13%
Clearly defined goals and directions (E2)	1.36%	6.80%	9.52%	48.30%	34.01%
Appropriate project schedule (E3)	18.37%	10.88%	31.29%	36.05%	3.40%
Timely control of key aspects of project (E4)	17.01%	24.49%	34.69%	10.88%	12.93%
Adequate use of project management techniques (E5)	20.41%	27.21%	35.37%	10.20%	6.80%
Adequate use of technical skills (E6)	13.61%	17.69%	42.86%	13.61%	12.24%
Competent project leader (E7)	15.65%	24.49%	42.18%	10.88%	6.80%
Competent project team members (E8)	12.93%	18.37%	38.78%	18.37%	11.56%
Clearly defined responsibilities for each team member (E9)	2.04%	6.80%	10.20%	57.14%	23.81%
Enough synergy among team members (E10)	2.72%	14.29%	7.48%	48.98%	26.53%
Enough expertise of the project manager (E11)	21.09%	10.88%	29.25%	35.37%	3.40%
Adequate risk management skills of the project manager (E12)	17.69%	25.17%	34.01%	10.88%	12.24%
Adequate risk management skills of each team member (E13)	23.81%	25.85%	33.33%	10.20%	6.80%
Ability to handle unexpected problems (E14)	15.65%	19.73%	41.50%	13.61%	9.52%
Adequate consultation with stakeholders (E15)	19.05%	23.81%	39.46%	10.88%	6.80%
Provision of timely data to key players (E16)	15.65%	18.37%	36.05%	17.69%	12.24%
Acceptance of project results by client (E17)	6.12%	6.80%	10.20%	52.38%	24.49%
Stakeholder satisfaction with quality of service provided (E18)	6.80%	10.88%	8.16%	48.30%	25.85%
Owner involvement within the project (E19)	21.09%	10.88%	31.29%	33.33%	3.40%
Adequate support for project from top management (E20)	20.41%	24.49%	31.97%	10.88%	12.24%

The table provides percentages for 20 indicators of the ability of respondents to prepare adequately for conducting business in future. It can be seen from the table that the respondents by and large are capable of preparing themselves for conducting business in future.

Table 7 shows 16 factors that are significantly associated with the ability to complete projects successfully.

Table 7: Results obtained from two-by-two crosstab analyses (n=147)

List of 16 factors that are significantly associated with the successful completion of projects	Observed chi-square value	P-value
Duration of experience in project management	73.6615	0.000
Age of respondent	39.8235	0.000
Duration of employment	37.1824	0.000
Level of education of respondent	30.4051	0.000
Ability to clearly define project goals and directions	12.4026	0.002
Ability to handle unexpected outcomes	9.6487	0.008
Project risk management skills	8.8641	0.012
Project management techniques	8.7732	0.012
Ability to clearly define project role	8.2349	0.016
Consultation with stakeholders	8.0899	0.018
Competency in project leadership	8.0155	0.018
Technical skills	7.9859	0.018
Problem solving skills	7.5194	0.023
Ability to meet expectations of stakeholders	7.4689	0.024
Sharing ideas with team members	7.1451	0.028
Potential benefits of projects	6.1571	0.046

Table 8 shows 5 influential factors that affect the ability of respondents to complete projects successfully. The estimates were obtained from ordered logit regression analysis in which odds ratios were used as an econometric measure of effect (Hosmer Jr, Lemeshow & Sturdivant, 2013).

Table 8: Odds ratios estimated from ordered logit analysis (n=147)

List of 5 influential predictors of the successful completion of projects	Odds Ratio	P-value	95% confidence interval
Duration of experience in project management	7.8014	0.0000	(5.42, 9.88)
Age of respondent	6.7012	0.0000	(4.93, 9.01)
Duration of employment	5.6823	0.0000	(4.67, 8.75)
Level of education of respondent	3.4557	0.0000	(3.79, 7.17)
Ability to clearly define project goals and directions	2.8926	0.0000	(2.09, 5.64)

Table 8 shows that the ability of respondents to complete projects successfully (within time and cost without lowering quality standards) was significantly influenced by the following 5 variables of study:

1. Duration of experience in project management
2. Age of respondent
3. Duration of employment
4. Level of education of respondent
5. Ability to clearly define project goals and directions

Standard diagnostic procedures were used for assessing the reliability of the fitted logit regression model. The fitted logit model had the ability to accurately classify 79.19% of attributes. A P-value of 0.2119 was obtained from a goodness-of-fit test developed by Hosmer Jr, Lemeshow and Sturdivant (2013). This figure of 0.2119 is above 0.05 or 5%. This finding confirms that the fitted ordered logit regression model is theoretically reliable.

Interpretation of significant odds ratios

The odds ratio of the variable "Duration of experience in project management" is equal to 7.80. This indicates that an employee who has a relatively large duration of experience in project management (longer than 5 years) is 7.80

times more likely to complete designated projects successfully in comparison with an employee who has a short duration of experience in project management (5 years or less). The odds ratio of the variable "Age of respondent" is equal to 6.70. This indicates that an employee who is relatively old enough (36 years old or older) is 6.70 times more likely to complete designated projects successfully in comparison with an employee who is relatively young (35 years old or younger). The odds ratio of the variable "Duration of employment" is equal to 5.68. This indicates that an employee who has served the company relatively long enough (6 years or longer) is 5.68 times more likely to complete designated projects successfully in comparison with an employee who has not served the company long enough (5 years or less). The odds ratio of the variable "Level of education" is equal to 3.46. This indicates that an employee whose level of education is relatively high (Bachelor's degree or above) is 3.46 times more likely to complete designated projects successfully in comparison with an employee whose level of education is low (Diploma or less). The odds ratio of the variable "Ability to clearly define project goals and directions" is equal to 2.89. This indicates that an employee who is capable of defining project goals and directions clearly enough is 2.89 times more likely to complete designated projects successfully in comparison with an employee who lacks the ability to define project goals and directions clearly enough.

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