Project Reputation in Construction: A Process-based Perspective of Construction Practitioners in the UK

Abstract

The overall aim of this study is to elicit the perspective of practitioners (e.g. architects, civil engineers, building engineers, structural engineers and quantity surveyors) on the process-related factors influencing the project reputation of construction organisations. To achieve this aim, the study adopts a mixed methods approach which commenced with a review of extant literature in order to produce an exhaustive hypothetical list of process-related factors influencing project reputation. This review resulted in the identification of 29 process-related factors which was operationalised into a questionnaire survey. After an essential pilot study was conducted, the survey was distributed to a wide audience of construction practitioners in order to elicit their experiential opinion on process-related factors influencing project reputation of construction organisations. The responses from the survey were subjected to statistical processes, which include Reliability Analysis, Relative Importance Index (RII), Kruskal-Wallis and Multiple Regression Analysis. After establishing 25 statistically reliable process-related factors influencing project reputation via reliability analysis, the study further revealed an impressive general agreement of 88% of the process-related factors. Multiple regression analysis was subsequently conducted to unravel the key drivers influencing project reputation of construction organisations. This analysis revealed six key factors which include: *successful completion of project without adverse environmental issues*; *competent project manager*; *friendly culture generated within project*; *competent project participants*; *successful completion of project without health and safety issues* and *regular client consultation*. This research finding will provide a benchmark for construction organisations to develop project reputation which will invariably impact organisational reputation. In addition, the findings of this study will allow project stakeholders to prioritise 'few' critical issues that will unquestionably impact their project reputation during the implementation of the project plan.

Keywords: Project Reputation, Project Success, Project as a Product, Project as a Process.

1 Introduction

According to experts, firm reputation, when positive, is deemed to be an invaluable asset which is recognised as one of the essential foundations on which organisational success is founded (Christensen and Lodge, 2018). According to Vidaver-Cohen (2007), this foundation for success emanates from the backdrop that a positive reputation can stimulate competitive advantage, reduce stakeholder doubts about future organisational performance and maximise the ability to receive a premium for a service. In realisation of this corporate worth of reputation, it is no surprise that reputational management issues have moved from the periphery to the mainstream in organisations (Ginesti *et al.*, 2018), particularly in organisations that are project-based. Extensive studies on project performance such as Khan *et al.* (2013), Mir and Pinnington (2014) and Olawale et al. (2020a) have revealed the association between project performance and reputation. In particular, Khan *et al.* (2013) asserted that when a project delivers or fails to deliver the benefits for which it was created, positive or negative reputation is established.

Based on the above assertion, the case of construction Project-based Organisations (PBOs) is therefore unique in this sense. For example, construction PBOs are known to operate in a dynamic environment where they undertake multiple unique projects which differ in size and complexity. Each of these projects could impact the given construction firm's reputation positively or negatively. Considering the latter, there have been many cases in the public domain of well-known project organisations whose reputation was smeared, because one of their projects received severe criticism from stakeholders (e.g. Charles de Gaulle Airport – Terminal 2E) (Olawale et al., 2020a). This indicates that one recent failure can have a lasting negative impact on the reputation of construction PBOs. It is therefore crucial for construction firms to pay attention to their performance on projects because their organisational longevity depends on it. However, given the subjective nature of reputation, the big question is who then judges project performance or whose judgement matters most? Resolving the above question is crucial, especially when the evaluation of project reputation is contingent on the nature, stakeholder perspective and timing of such evaluation. Thus, it is not surprising that judging project performance continues to be a concept surrounded by so much ambiguity and divergent views (McLeod *et al.*, 2012).

As exemplified in Figure 1, the conceptual ambiguity of project performance is further intensified by two divergent lines of thought in project management which views projects as either a product or as a process (Ika, 2009; Olawale et al., 2020a). These two schools of thought have a huge influence on the perspective with which project performance is considered. For instance, one of the major proponents of project as a product is the PRINCE2 Body of Knowledge, which focuses explicitly on the final outcome/product/service intended for an identifiable stakeholder (Olawale et al., 2020a). The underlying argument behind the product perspective stems from the indication that projects are ultimately product-driven and as such, must be delivered in line with the key qualities and specifications that will ensure its acceptance by clients (Diallo and Thullier, 2004; Hyväri, 2006). On the other hand, the underlying notion behind the process perspective is grounded on the explicit focus on the success of the various processes that facilitates delivery of a project for an identifiable stakeholder (Zwikael and Globerson, 2006; PMBOK, 2013).

Relying on the perspective of these two schools of thought, it is, therefore, pertinent to note that the acceptance criteria for project performance will depend largely not only on these two project management perspectives but also on the perspectives with which project stakeholders examine project success. Evidences show that project investors, clients and users are usually product-oriented in their perspective because they are mainly concerned about projects matching or exceeding their existing or perceived quality expectations (Pinto, 1998; Baccarini, 1999). On the other hand, beyond delivering the final product, practitioners are believed to be mostly concerned about the success of the series of processes and the successful completion of process-related milestones that ultimately result in project completion (Blomquist *et al.*, 2010). This study follows the latter line of thought and seeks to examine the process-related factors influencing project reputation from the perspective of construction practitioners (i.e. architects, civil engineers, building engineers, structural engineers and quantity surveyors). It is on this premise that this study emerges as a significant contribution to the gap in literature on project reputation by arguing that, from a practical and practitioner approach, a project gains its reputation, not entirely from the success of the final product (Stark, 2015), but also based on the success of various best practices, techniques and approaches, all of which are process-oriented. Based on the above aim, the following objectives have been identified:

1. To produce an exhaustive list of process-related factors and examine their relative importance in regards to how they influence project reputation of construction organisations from extant literature.
2. To evaluate the degree of perception variation of process-related factors influencing project reputation among stakeholders in construction organisations.
3. To identify the key process-related drivers of project reputation for construction organisations.

2 Project Reputation and Project Performance

According to Khan et al. (2013), reputation is created by the actions and results of organisations. So, when an organisation delivers or fails to deliver a project/product/service, a positive or negative reputation is respectively established. Based on this elucidation, Kilduff and Krackhardt (1994) argue that in order to measure reputation, the organisation's past actions and performance must be examined. For example, to examine the reputation of construction organisations (which are typically project-based), their performance on each of their multiple projects must be examined. By doing so, consistent organisations are distinguished from inconsistent organisations, high-quality organisations from low-quality organisations (Rao, 1994) and top performers from underperformers (Spence, 1978). However, this study argues that each project has its unique reputation, which independently influences the construction organisation's reputation. This is known as project reputation, which is the aggregate/combined perception of stakeholders about a project's quality and functionality (fitness of use). The concept of project reputation is analogous to the marketing domain where different range of products contributes to the organisational reputation of the business/company as a whole.

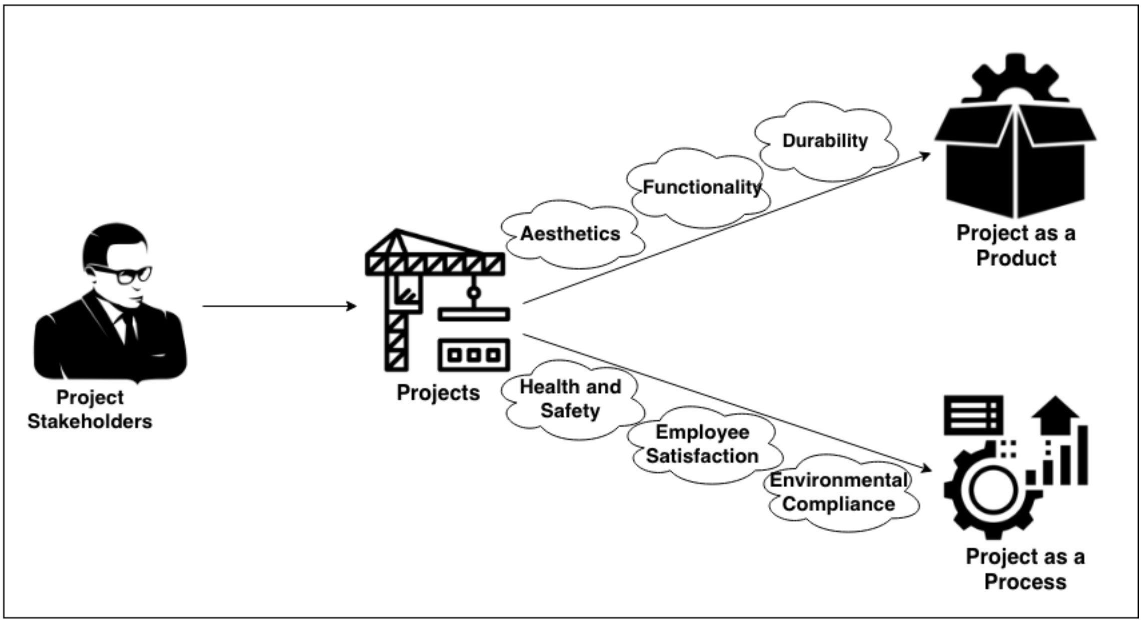

Figure 1: *Project as a Product or as a Process (Adapted from Olawale et al., 2020a)*

Based on an organisation's particular project reputation, prospective clients can form some expectations about an organisation's performance on potential similar projects. While the concept of project reputation seems laudable, issues arise when trying to uncover whose opinions matter most when judging project performance which develops project reputation, especially when such evaluation is contingent on the nature, stakeholder perspective and timing of evaluation (Thomas and Fernandez, 2008; Ika, 2009). These issues have led to a lack of consensus when defining project performance because it is shrouded by so much complexity and ambiguity. In order to understand the complexities associated with project reputation, elements contributing to the ambiguity of project performance will be subsequently illuminated in this section.

2.1 Complexities associated with project performance

2.1.1 Project Performance Criteria

Project performance criteria refer to a set of principles or standards used to judge project performance. While there are different principles and standards for adjudging project performance (Atkinson, 1999; Chan *et al.*, 2004; Bannerman, 2008), there is no consistent principle or standard. This lack of consistency is grounded on the disagreement that the criteria used to evaluate project performance is dependent on stakeholders' project expectations and the extent at which those criteria are fulfilled (Lim and Mohamed, 1999). Due to the multiple stakeholders involved in a project, different stakeholders will hold different project performance criteria (Baccarini, 1999; Olawale et al., 2020b), most of which are inherently incompatible and mutually exclusive on projects. Much of these varying project performance criteria have been documented in the literature. For instance, De Wit (1988) argue that the most important criteria for measuring project performance is the degree to which project objectives are met. Contrastingly, authors such as Nguyen *et al.* (2004), Chan *et al.* (2004) contend that project performance ought to be measured against the general criterions of time, cost and quality, which is known as the "Iron Triangle" (Atkinson, 1999). While the iron triangle remains the most widely discussed in the literature, McLeod *et al.* (2012) argue that the iron triangle is limited in scope, thus, it ignores the interest and perception of internal and external stakeholders in projects, which are crucial to the project (Jugdev and Müller, 2005; Baccarini, 1999). As such, scholars like Bryde and Brown (2005) and Pinto and Slevin (1998) believe that the overall satisfaction of both internal and external project stakeholders is the most essential for project performance. According to these studies, since typical projects often involve multiple participants, success/failure on the project will, therefore, depend on the fulfilment/nonfulfillment of their expectations (stakeholder satisfaction) on the project. Other commentators that align with this viewpoint include Bannerman (2008), Jugdev and Müller (2005), Lim and Mohammed (1999) and Baccarini (1999). Coming from the above perspectives, it is important to note that different stakeholders will hold different project performance criteria, however, these criteria are inherently incompatible and mutually exclusive on projects, thus, "absolute success/failure" is, therefore, not possible (Olawale et al., 2020b). In realisation of this differing project performance criteria, there is the need to establish common goals at the initiation stage of a project with all the stakeholders so that varying perceptions be reduced to a minimum (Liu and Walker, 1998).

2.1.2 Project Performance Perception

Project performance perception can be construed as the belief or opinion that an individual or a stakeholder group has about what project success entails. Project performance perception is often guided by an intuitive performance criterion which project stakeholder's hold. This subsequently informs the basis for which stakeholders will judge projects. Authors such as Ika (2009) and Bannerman (2008) argue along this line that a typical project has a wide range of stakeholders, all of whom possess their subjective perception towards project performance. Given that a typical construction project often involves multiple individuals such as project sponsors, contractors, end-users, insurers, architects, engineers among others; their perceptions of ideal project performance will most likely differ in relation to one another. To put this into perspective, a project may be deemed successful by a project sponsor based on his/her own post-project financial profit realisation, while the same project may be considered a failure to a contractor because it was not a profitable venture for his organisation (Olawale et al., 2020b). This effectively means that a project might be considered a success for one group while it is perceived as a failure to other groups based on the distinct success criteria which they possess (Baccarini, 1999; de Wit, 1998). The presence of these differing project success perceptions confirms the notion of Baker *et al.* (1974) that there is no "absolute success" because it is almost impossible for a project to satisfy all the stakeholders involved in a project. In realisation of this varying project success perception, Liu and Walker (1998) suggest the compelling need to establish common goals at the initiation stage of a project with all the stakeholders so that varying perceptions be reduced to a minimum. In another compelling suggestion, Boddy and Paton (2004) argue the need to conduct a stakeholder analysis of project stakeholders at the beginning of a project in order to determine which stakeholders will have the most influence in determining project success. As such, the project should be fine-tuned towards meeting the goals set by the most important stakeholders if the project is to be a success.

2.1.3 Project Performance Temporality

In adjudging project success, it is pertinent to note that the timing of evaluation is of utmost significance. According to Lanzara (1999), project success evaluation is not necessarily static and may change when situations and contexts evolve. To substantiate this claim, there have been many cases within the project management literature and the public domain of projects (e.g. The

Concorde, The Sydney Opera House) being perceived as failures at their launch but would later become models for success (Ika, 2009; Olawale et al., 2020b). On the other hand, even projects that were perceived as success at launch later turned out to be a colossal failure (e.g. Charles de Gaulle Airport – Terminal 2E). This indicates that project success is contingent on the timing of evaluation and this contributes immensely to the ambiguity surrounding the concept. As we have exemplified in the above real-life case studies, projects that have been adjudged as a success today can be judged a failure overnight. However, authors such as Jugdev and Müller (2005) and Atkinson (1999) have suggested that projects should be subjected to multiple evaluations at different points in time during the project life cycle for different purposes.

2.2 Comprehensive List of Process-related Success Factors

It is imperative to reiterate that a significant manner in which a project-based organisation can enhance its reputation positively is by consistently delivering projects objectives, which typifies project success. However, in the case of viewing a project under the lenses of a project as a process, the project's objectives are traditionally concerned with delivering to the traditional criteria of time, budget and quality (De Wit, 1988; Baccarini, 1999). However, in recent times, several researchers have challenged the limiting scope of the traditional criterion and have identified other process-related factors influencing project reputation. Authors such as Pinto and Slevin (1987) argue that regular meetings with clients and project participants is of utmost importance when seeking to achieve process success. This is particularly important because it gives both the client and the project participants the opportunity to keep track of their activities. Since project as a process considers the manner at which a project is managed throughout the project life-cycle, emphasis is placed on the competence (Loo, 2002; Laufer *et al.*, 1996; Sanvido *et al.*, 1992) and project experience of project participants/staffs (Belassi and Tukel, 1996) delivering the project. This also includes the competency (knowledge of project methods) and leadership of the project manager and how he/she manages the project (risk, procurement) communicate, hire project staffs etc (PMBOK, 2013; Chua *et al.*, 1999; Belassi and Tukel, 1996).

This includes the delegation of responsibilities to appropriate and capable team members and setting deadlines where appropriate. For example, in a construction project, the project manager manages health and safety processes by identifying and upholding health and safety measures to minimise threats to staffs and those affected by the work throughout the project life cycle. As such, success will depend on the successful completion of project without health and safety issues (Chan *et al.*, 2004; Chua *et al.*, 1999) and the successful completion of project without environmental issues (Chan *et al*., 2004; Akinsola *et al*., 1997). This wide-ranging influence of the project manager explicates why PMBOK (2013) considers he/she as the most responsible person for project success or failure. Not only are the project participants crucial to the process success of a project, their cohesiveness on the project is also important. Due to the multiple disciplinary nature of projects, the project manager is crucial to ensuring the creation of a positive environment and a friendly culture generated within the project (Khalfan *et al*., 2007; Wang and Noe, 2010). Furthermore, Pinto and Slevin (1987) considers top management support as being a crucial process-related success factor because it typifies the competency of the management to provide adequate resources during the lifecycle of the project. This also includes the provision of recent technological advancement of project materials required for the successful completion of the project (Chan *et al*., 2004; Akinsola *et al*., 1997).

Table 1: Process-related factors capable of influencing positive project reputation from extant literature review

S/N	Project as a process-related factors capable of influencing project reputation	Sources in Literature
1.	Meeting or exceeding client quality expectations	Geraldi, Kutsch and Turner (2011).
2.	Finishing on time	Atkinson (1999); Diallo and Thuillier (2004), Hyväri (2006).
3.	Effective management of client variation/order changes	Saram and Ahmed (2001); Jha and Iyer (2006); Kusimo *et al.* (2019).
4.	Finishing within budget	Akinsola *et al.* (1997); Chan *et al.* (2004).
5.	Conducting regular meetings and design reviews	Saram and Ahmed (2001); Jha and Iyer (2006).
6.	Successful completion of project without adverse health and safety issues	Chua *et al.* (1999); Kumaraswamy and Chan (1999); Chan *et al.* (2004).
7.	Successful completion of project without adverse environmental issues	Hubbard (1990); Akinsola *et al.* (1997); Chua *et al.* (1999); Chan *et al.* (2004).
8.	Regular client consultation	Egbu (1999); Nguyen *et al.* (2004); Toor and Ogunlana (2008).
9.	Delegation of responsibilities to appropriate project participants	Belassi and Tukel (1996); Nguyen *et al.* (2004), Jha and Iyer (2006).
10.	Amicable resolution of differences/confusion amongst project participants	Pinto and Slevin (1987); Hubbard (1990); Chan *et al.* (2004), Jha and Iyer (2006).
11.	Providing an organised means for gathering information and compiling records	Saram and Ahmed (2001); Jha and Iyer (2006).
12.	Efficient management of budget variations	Saram and Ahmed (2001); Jha and Iyer (2006).

13.	Strategic alignment of design goals with client interests	Egbu (1999); Nguyen *et al.* (2004); Ogunlana (2008).
14.	Ensuring the efficient use of materials	Minato (2003).
15.	Competent project participants	Toor and Ogunlana (2008); Mir and Pinnington (2014).
16.	Establishing and maintaining an effective organizational structure and communication channels	Saram and Ahmed (2001); Jha and Iyer (2006).
17.	Competent project manager	Toor and Ogunlana (2008); Ahadzie *et al.* (2008)
18.	Top management support	Young and Jordan (2008); Trkman (2010).
19.	Sufficient level of project experience from project participants	Walker (1995).
20.	Maintaining proper relationships with client, consultants and the subcontractor	Saram and Ahmed (2001); Jha and Iyer (2006).
21.	Commitment/motivation throughout organizational structure	Radujković (2014).
22.	Friendly culture generated within projects	Khalfan *et al.* (2007); Wang and Noe (2010).
23.	Sound expectations of staff performance and training requirements	Ismail, Doostdar and Harun (2012).
24.	Minimal disruption to local community	Belassi and Tukel (1996); Akinsola *et al.* (1997).
25.	Preparation of a quality plan in line with clients brief	Saram and Ahmed (2001); Jha and Iyer (2006).
26.	Clear and realistic design objectives	Pinto and Slevin (1987); Tukel and Rom (1995); Chua *et al.* (1999); Chan *et al.* (2004).
27.	Regular monitoring and control of quality plan implementation	Saram and Ahmed (2001); Jha and Iyer (2006).
28.	Ensuring the availability, suitability and compatibility of materials used in the design	Tukel and Rom (1995); Belassi and Tukel (1996); Minato (2003).
29.	Correct use of construction materials, methods and techniques	Sanvido *et al.* (1992); Laufer *et al.* (1996); Loo (2002).

As depicted in Table 1, 29 process-related factors capable of influencing positive project reputation were identified from extant literature. These hypothetical factors will be empirically tested to determine whether they actually influence project reputation.

3 Methodology

After achieving the first objective of the study (identification of process-related factors from extant literature), it was important in fulfilment of the other objectives of the study to adopt a method that drives in-depth understanding as well as generalisability. Hence, the study adopted an exploratory sequential mixed method design. By doing so, the study uses the results of the qualitative research – first phase (process-related factors) to develop/inform quantitative research – second phase (see methodological flow-chart of the study in Figure 2). From the resulting process-related factors identified from the qualitative study, a comprehensive quantitative study was undertaken vis-à-vis questionnaire survey, which is a research instrument that provides a cost-effective way of reaching out to large number of respondents to ensure higher generalisability of results (Creswell, 2014).

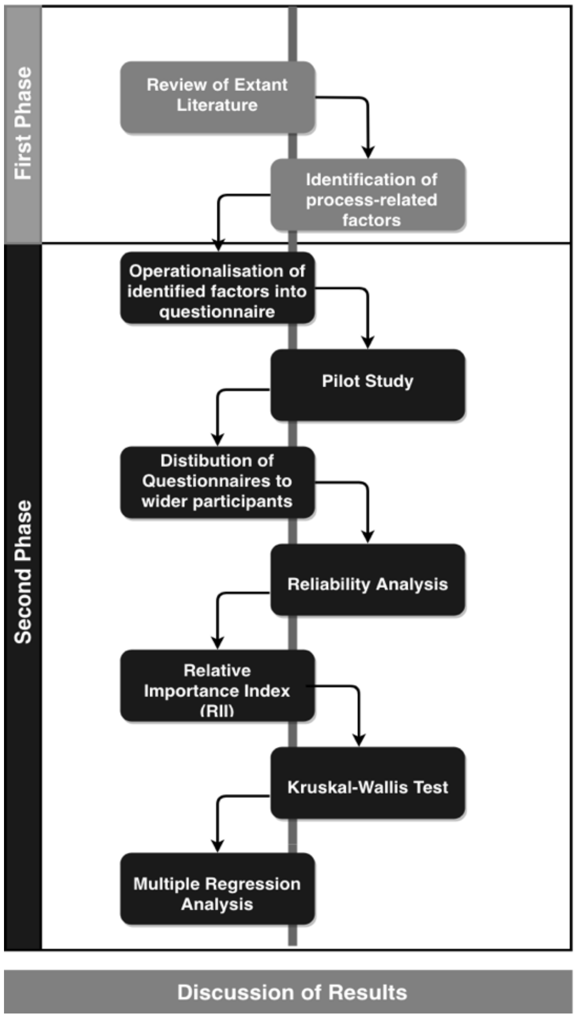

Figure 2: Methodological flow chart for the study

In developing the questionnaire, the identified list of factors was reviewed and subsequently operationalised into the design of the research instrument. The first section of the questionnaire contained descriptive data about respondents and their organisations. The next section presented the process-related factors and respondents were asked to rate each of the factor according to how they believe they influence project reputation. This was done on a five-point Likert scale of 1-5 on "importance" (where 1 = "not important", 2 = "less important", 3 = "important", 4 = "more important", and 5 = "most important"). Since selection of the process-related factors was based on a review of extant literature, it was important to assess internal validity (Mir and Pinnington, 2014). Hence, a pilot study was conducted to improve the internal consistency of the research instrument by validating the process-related factors and mitigating grammatical and structural errors. The questionnaire draft was piloted to three industry and two academic professionals who are vastly experienced in working and researching construction projects respectively (see Table 2 for the demographics of pilot study respondents). Their input proved invaluable as they suggested a re-wording of some of the factors and a re-designing of the layout of the questionnaire to produce an unequivocal questionnaire representative of the intended sample population. The changes suggested by the pilot study participants were implemented in the design of the final draft questionnaire.

Table 2: Demographics of vastly experienced pilot study respondents

Academic Scholar	***Years of experience researching construction projects***
1. Professor	26 years
2. Associate Professor	21 years
Industry Practitioner	***Years of experience working on construction projects***
1. Estimation Manager	19 years
2. Project Manager	21 years
3. Health and Safety Manager	10 years

On completion of the questionnaire, an introductory email, including a hyperlink to the online survey (hosted by surveymonkey.com) was sent out to construction industry professional directories. This include the Royal Institute of Chartered Surveyors (RICS), Chartered Institute of Buildings (CIOB), Institution of Civil Engineers (ICE), Royal Institute of British Architects (RIBA) and the Institution of Structural Engineers (IStructE). The study adopted this random sampling technique to prevent potential bias (Gravetter and Wallnau, 2013). The aforementioned directories represented a critically sampled population of job professions of all the important stakeholders involved in construction project process which include architects, building contractors, civil engineers, structural engineers and quantity surveyors (see Table 3 for the demographics of survey respondents). A total of 196 questionnaires was distributed to respondents with complete email addresses between October 2018 and January 2019. After several follow-up emails, a total of 118 questionnaires were returned out of 196 distributed. This indicated a response rate of 60.2% which was very impressive considering the demanding job roles of the sample population. According to Oyedele (2013), this percentage of return indicates that the study is suitable for analysis since any survey return rate lower than 30 to 40% might be regarded as biased and of little significance. After the removal of bad data and outliers, the total number of usable responses considered for qualitative analysis was 115. From the resulting process-related factors identified from the qualitative study, a comprehensive quantitative study was undertaken vis-à-vis questionnaire survey, which is a research instrument that provides a cost-effective way of reaching out to large number of respondents to ensure higher generalisability of results (Creswell, 2014). In drafting the questionnaire, the identified list of factors was reviewed and subsequently operationalised into the design of the research instrument. The first section of the questionnaire contained descriptive data about respondents and their organisations.

Table 3: Demographics of survey respondents

Variables	Sample size	% of Respondents
Total questionnaire distributed	196	100%
Total of received responses	118	60.2%
Discarded responses	3	2.5%
Total number of usable responses	115	97%
Job roles		
Architects (RIBA)	30	26.0%
Building Contractors (CIOB)	23	20%
Civil Engineers (ICE)	20	17.3%
Quantity Surveyors (RICS)	23	20%
Structural Engineers (IStructE)	19	16.5%
Years of experience		
0-5	4	3.4%
6-10	25	21.7%
11-15	16	13.9%
16-20	27	23.4%
21-25	24	20.8%
Above 26 years	19	16.5%

4 Data analyses and findings

In an effort to achieve the aim and objectives of this study, quantitative data analyses were conducted vis-à-vis statistical analyses using a popular statistical analysis software, the Statistical Package for Social Science (SPSS) version 24. These statistical analyses include reliability analysis, Relative Importance Index, Kruskal-Wallis test and Regression Modelling.

4.1 Reliability Analysis

According to Santos (1999), reliability analysis determines the internal consistency or average correlation of constructs in the results of a questionnaire survey. As such, this study subjects the responses of the questionnaire survey to reliability analysis in a bid to determine the internal consistency of the constructs as well as the suitability of the data for analysis. This is in line with the recommendation of social scientists (Field, 2009). Hence, Cronbach's alpha (α) coefficient of reliability was calculated for the process-related factors using Eq. (1).

$$\alpha = \frac{N^2\overline{COV}}{\sum_{i=1}^{N} S_i^2 + \sum_{i=1}^{N} COV_i} \quad (1)$$

Based on the above equation, N represents the total number of factors, $\overline{COV}$ is the average covariance between factors, and S^2_i and COV_i are the variance and covariance of factor 'i' respectively. Field (2009) suggests that the higher the outcome of the Cronbach alpha reliability coefficient, the greater the internal consistency of the data. This is exemplified in the ranges from 0 to 1, where $a < 0.5$ is unacceptable, $0.6 > a \geq 0.5$ is poor, $0.7 > a \geq 0.6$ is questionable, $0.8 > a \geq 0.7$ is acceptable, $0.9 > a \geq 0.8$ is good and $a \geq 0.9$ is excellent. Using SPSS version 24, the overall Cronbach's alpha coefficient for this study was 0.903 (see below Table 4 for results of the statistical test), which is above the acceptable 0.7 recommended by Pallant (2013) and Streiner (2003). To confirm whether all the process-related factors were truly contributing to the internal consistency of the data, "Cronbach's alpha if item deleted" was examined. The rule that drives the examination of "Cronbach alpha if item deleted" is that any criterion not contributing to the internal consistency of a data will have a higher reliability coefficient (Field, 2005). In the case of this study, item(s) that holds a Cronbach alpha above 0.903 indicates that such item is not truly contributing to the internal consistency of the data. On this basis, four (PRF12, PRF13, PRF24 and PRF27) out of the 29 process-related factors had a value above 0.903. These process-related factors were deemed unreliable and subsequently deleted from further analyses.

4.2 Relative Importance Index (RII)

After establishing a statistically reliable list of process-related factors, it was essential for this study to examine the top process-related factors influencing project reputation. In examining this premise, two descriptive statistics were considered for this study, this includes descriptive mean testing and Relative Importance Index (RII). The study swayed in favour of RII because descriptive mean testing ranks only the mean of each factor and does not reflect any relationship between factors (Iyer and Jha, 2005; Kumaraswamy and Chan, 1998). In addition, RII was chosen over descriptive mean testing because it can statistically differentiate two or more factors which have the same variance by examining the distribution of the importance weighting of such factors (Kumaraswamy and Chan, 1998). Hence, the RII derived to indicate the importance of each `process-related factor' was computed using Eq. (2).

$$RII = \frac{\sum_{i=1}^{N} W_i}{(A * N)} \quad (2)$$

Based on the above equation, RII represents the Relative Importance Index; W signifies the importance weighting, (i.e. ranking from 1 to 5) given to each factor by the respondents; A is the highest possible weight (5) that the factors could have and; N is the total number of respondents (115). The higher the RII, the more important the factor, the more it influences project reputation. In a seemingly problematic case where the RII score were the same for two or more factors, rank distinction was achieved by examining the distribution of the importance weighting of such factors (Kumaraswamy and Chan, 1998). For example, when comparing two factors which had the same RII score, if more respondents had ranked one of the factors as "very important" (rank of 5) than the other factor(s), then the former was assigned the higher rank. Based on the result of the RII as shown in Table 4, the top five process-related factors influencing project reputation are:

1. PRF – 1 exceeding client quality expectations.
2. PRF – 2 finishing on time.
3. PRF – 15 competent project participants.
4. PRF – 17 competent project manager.
5. PRF – 4 finishing within budget.

4.3 Kruskal-Wallis Test

After examining the reliability and the RII of the questionnaire survey, it became essential for this study to examine whether the process-related factors were perceived similarly or differently by the respondents according to their job roles of being architects, building contractors, civil engineers, quantity surveyors and structural engineers. This was achieved through Kruskal-Wallis test which is a non-parametric test used to determine the significant statistical difference between more than two independent groups of respondents (Field, 2009). This test was measured in line with the recommendation of Field (2009) that at 95% confidence level, any p-value below 0.05 indicates a significant difference while a p-value above indicates a non-significant difference among the groups of respondents. After the test was carried out, the result showed that the respondents disagreed in their perception of three (PRF 11, PRF 20 and PRF 22) of the process-related factors. These include "*provision of organized means for gathering information and compiling records*", "*good compatibility between the team members*" and "*friendly culture generated within projects*" respectively. Despite this lack of total convergence, it can be construed that there was a general agreement as 88% of the listed process-related factors were agreed upon by the respondents irrespective of their different job roles. This variance implied that the entire data was very much valid and was subsequently retained in a bid to develop a regression model to identify the most important drivers of project reputation, based on the perspective of the sampled construction industry practitioners.

Table 4: Process-related factors and associated statistical results

S/N	Process-related factors	Reliability Analysis [a]		Relative Importance Index Ranking		Kruskal-Wallis Test	
		Corrected Item: Total Correlation	Cronbach's Alpha if Item Deleted	RII Score	RII Overall Ranking	Chi-square	Sig.[d]
PRF – 1	Exceeding client quality expectations	0.301	0.902	0.90163934	1	8.767	0.067
PRF – 2	Finishing on time	0.35	0.901	0.90163934	2	5.622	0.254
PRF – 3	Effective management of client variation/order changes	0.606	0.897	0.84262295	8	14.2	0.053
PRF – 4	Finishing within budget	0.539	0.898	0.8557377	5	5.292	0.185
PRF – 5	Efficient management of budget variations	0.745	0.894	0.80983607	11	14.58	0.06
PRF – 6	Successful completion of project without adverse health and safety issues	0.422	0.900	0.85245902	6	14.611	0.06
PRF – 7	Successful completion of project without adverse environmental issues	0.586	0.897	0.79344262	14	7.083	0.083
PRF – 8	Regular client consultation	0.411	0.901	0.7704918	17	12.261	0.116
PRF – 9	Delegation of responsibilities to appropriate team members	0.328	0.902	0.79016393	15	5.235	0.264
PRF – 10	Amicable resolution of differences/confusion amongst team members	0.411	0.901	0.74754098	19	8.029	0.091
PRF – 11	Provision of organized means for gathering information and compiling records [c]	0.543	0.898	0.74754098	18	17.969	0.01
PRF – 12	Conducting regular meetings and design reviews [b]	0.133	0.905	×	×	×	×
PRF – 13	Strategic alignment of design goals with client interests [b]	0.229	0.904	×	×	×	×
PRF – 14	High level of interpersonal skill from the team	0.387	0.901	0.72459016	21	5.017	0.286

PRF – 15	Competent project participants	0.572	0.898	0.90163934	3	5.433	0.246
PRF – 16	Creating a positive group environment	0.663	0.895	0.80655738	13	7.968	0.057
PRF – 17	Competent project manager	0.62	0.897	0.87213115	4	8.959	0.062
PRF – 18	Top Management support	0.738	0.894	0.83606557	9	8.135	0.087
PRF – 19	High level of knowledge of the construction methods available	0.652	0.896	0.84918033	7	7.692	0.104
PRF – 20	Good compatibility between the team members [c]	0.565	0.898	0.83278689	10	11.503	0.021
PRF – 21	Commitment/motivation throughout organizational structure	0.451	0.900	0.80655738	12	9.952	0.071
PRF – 22	Friendly culture generated within project [c]	0.617	0.896	0.72131148	24	10.43	0.034
PRF – 23	Sound expectations of staff performance and training requirements	0.564	0.898	0.7704918	16	6.058	0.195
PRF – 24	Minimal disruption to local community [b]	0.148	0.904	×	×	×	×
PRF – 25	Preparation of a quality plan in with the clients brief	0.33	0.902	0.72459016	22	7.909	0.095
PRF – 26	Clear and realistic design objectives	0.486	0.899	0.72459016	23	9.499	0.064
PRF – 27	Regular monitoring and control of quality plan implementation [b]	0.232	0.904	×	×	×	×
PRF – 28	Ensuring the availability, suitability and compatibility of materials used in the design	0.41	0.901	0.68852459	25	5.845	0.203
PRF – 29	Correct use of construction materials, methods and techniques	0.372	0.901	0.72786885	20	6.151	0.105
	[a]*Overall Cronbach's alpha is 0.903.* [b]*Factor deleted from the list before RII and Kruskal-Wallis Test based on Cronbach Alpha if item deleted.* [c]*Item perceived differently by respondents.* [d]*Significant at 95% confidence interval = 0.05.*						

4.4 Multiple Regression Modelling

Following the identification of the reliable, top-ranked process-related factors and the examination of the differences in perception of respondents based on their job roles, the study proceeded to unravel the key drivers influencing project reputation. To achieve this objective, the study conducted a linear regression model based on the hypothetical assumption that one or more process-related factors (independent variable) will hugely correlate with the response variable (dependent variable) – project reputation. This is in line with previous studies such as Oyedele (2010), Oyedele (2013), Owolabi et al. (2020) who have used a regression model to the key drivers of key project-related constructs. As indicated in the questionnaire design, section two of the questionnaire measured the response/dependent variable by asking respondents to indicate the extent at which they believe each process-related factor influences project reputation. They achieved this by measuring each of the factors based on importance (where 1 = "not important", 2 = "less important", 3 = "important", 4 = "more important", and 5 = "most important"). A typical mathematical formula for a regression model is calculated using Eq. (3).

$$\boldsymbol{Y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \cdots + \beta_i X_i + \epsilon \tag{3}$$

In this study, Y represents the dependent variable (Project Reputation – PR); B_0 is the ever-constant intercept term, B_1, B_2, B_3, B_4 represents the coefficient of the first (PRF1), second (PRF2), third (PRF3) and fourth (PRF4) factor respectively; while B_i is the coefficient of the I factor PRF, while ϵ is the mean-zero random error term (the difference between the predicted and actual value of the BCCR for the ith respondents. Based on these exemplifications, the regression model for this study is calculated as:

$$PR = \beta_0 + \beta_1 PRF_1 + \beta_2 PRF_2 + \beta_3 PRF_3 + \beta_4 PRF_4 + \cdots + \beta_i PRF_i + \epsilon \tag{4}$$

Using SPSS version 24, a step-wise model was executed on the data. Table 5 presents the summary of the multiple regression model that contains six possible models and their respective predictors. The third column of Table 5 indicates R Square (R^2), which is often referred to as the coefficient of multiple determination for multiple regression. As a rule of thumb, the coefficient of R^2 usually ranges between 0 and 100% or 0 and 1, and the higher the value, the better the model fits the observed data. While examining Table 5, it can be observed that, Model 6 shows the highest R^2 value of 0.615, which is also 61.5%. In essence, this indicates that this particular model is capable of predicting 61.5% of the variability in the dependent variable. On this basis, the model is therefore the most suitable for predicting the development of project reputation within the available dataset.

To confirm the model's (Model 6) fitness and accuracy, criteria such as Adjusted R^2, Standard Error of Estimate, Durbin-Watson test, and the Significance Level of the F Statistics in column 4, 5, 9 and 10 were explored respectively. According to Field (2009), the Adjusted R^2 is a measure of the fitness of the selected model beyond the available data, which should be equal or close to the R^2 values. As depicted in Table 5, there was a difference in the R^2 and the adjusted R^2 value (0.615 to 0.572/61.5% to 57.2%). This difference signifies a loss in predictive power of the model, however, the difference is considered to be very small (5.3% variance). As such, this still indicates that the model has a good cross-validity. Additionally, to explore whether the relationship between the explanatory variables and the outcome was perfect (less error by being closer to zero), a Standard Error of Estimate was investigated. While investigating Table 5, the model with the Standard Error value closest to zero was Model 6 with a value of 0.648, which confirms the predictive power of the model. Furthermore, a Durbin-Watson statistics test was examined to show whether the predicted observations showed uncorrelated and independent errors as suggested by Engle and Yoo (1987). As a rule of thumb for this test, Hill and Flack (1987) recommended that while the value for these correlations vary between 0 and 4, a value of 2 indicates uncorrelated residuals, which indicates a good model. In accordance with this rule, the study indicated a Durbin-Watson test value of 2.329 as shown in Table 5. This indicates the absence of autocorrelation which implies that the model was good. Lastly, in order to confirm whether the model perfectly fits the examined dataset, the study examined ANOVA's Significance Level of the F Statistics. When examining this test, it is recommended that at 95% interval, the value of the model should be less than 0.05. Table 6 confirms the fitness of Model 6 with a value of 0.00. After confirming the predictive accuracy and the fitness of the model, the study proceeded to identify the key factors predicting the development of project reputation. Based on the results of the multiple regression analysis, Model 6 as typified in Table 6 indicates that there are six best factors that are necessary for developing project reputation, out of the 25 reliable process-related factors. These six best factors are therefore regarded as the critical success factors influencing the development of project reputation.

Table 5: Multiple Regression Model Summary

Model	R	R Square	Adjusted R^2	Std. Error of the Estimate	Change Statistics			Durbin-Watson		
					R^2 Change	F Change	Sig. F Change		F	Sig.
1	.619a	.384	.373	.78479	.384	36.716	.000	2.329	36.716	0.00[b]
2	.673b	.453	.435	.74539	.070	7.402	.009		24.051	0.00[c]
3	.707c	.500	.473	.71930	.046	5.284	.025		18.979	0.00[d]
4	.737d	.543	.511	.69329	.044	5.357	.024		16.662	0.00[e]
5	.759e	.576	.538	.67409	.033	4.236	.044		14.947	0.00[f]
6	.784f	.615	.572	.64813	.039	5.493	.023		14.389	0.00[g]

Dependent Variable: Developing Project Reputation

a. Predictors: (Constant), PRF7.
b. Predictors: (Constant), PRF7, PRF17.
c. Predictors: (Constant), PRF7, PRF17, PRF22
d. Predictors: (Constant), PRF7, PRF17, PRF22, PRF15.
e. Predictors: (Constant), PRF7, PRF17, PRF22, PRF15, PRF6.
f. Predictors: (Constant), PRF7, PRF17, PRF22, PRF15, PRF6, PRF8.

Table 6: Multiple Regression Model Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	β			Tolerance	VIF
Constant (Dependent variable)	3.77	.632		5.975	.019		
PRF – 7 Successful completion of project without adverse environmental issues.	.431	.105	.498	4.108	.000	.486	2.059
PRF – 17 Competent project manager	-.291	.111	-.240	-2.636	.003	.858	1.166
PRF – 22 Friendly culture generated within project	.277	.102	.331	2.724	.008	.484	2.067
PRF – 15 Competent project participants	-.313	.104	-.282	-3.003	.011	.807	1.239
PRF – 6 Successful completion of project without adverse health and safety issues	-.285	.095	-.287	-2.989	.019	.775	1.291
PRF – 8 Regular client consultation	.274	.117	.243	2.344	.023	.663	1.509

Dependent Variable: Developing Project Reputation

These factors include:

1. PRF – 7 successful completion of project without adverse environmental issues.
2. PRF – 17 competent project manager.
3. PRF – 22 friendly culture generated within project.
4. PRF – 15 competent project participants.
5. PRF – 6 successful completion of project without adverse health and safety issues.
6. PRF – 8 regular client consultation.

After these factors were established, the study proceeded to check for the significance of the six factors using the t-test significance value for each factor, as well as the collinearity statistics as shown in Table 6 above. A good rule of thumb is that any factor showing a significance level of 0.05, is considered to be making significant contribution to the model (Field, 2009). In other words, the closer the value to 0, the higher the significance. From the result of the multiple regression model, as evidenced in column 6 of Table 6, PRF – 7 successful completion of project without adverse environmental issues shows the highest significance value at 0.00, while PRF – 8 regular client consultation shows the least significance at 0.023. To check the presence of multicollinearity among the factors, which could weaken the model, the variance inflation factor (VIF) and the tolerance statistics was examined under collinearity statistics. When evaluating this test, the yardstick is that the VIF should not be more than 5 and the tolerance statistics associated with the VIF should not be less than 0.2. Based on this yardstick, all the VIF statistics are between 1.1 and 2.0, which is less than 5, while all the tolerance statistics are above 0.2. This is reliably indicated in column 7 and 8 in Table 6. These results therefore confirm the absence of multicollinearity among the factors. Consequently, with values from unstandardized coefficient as shown in Table 6 above, the optimum regression model for the study (statistical correlation between project reputation and its associated process-related factors) is therefore computed as:

$$\boldsymbol{PR = 3.77 + 0.431\,(PRF7) - 0.291\,(PRF17) + 0.277\,(PRF22) - 0.313\,(PRF15) - 0.285\,(PRF6) + 0.274\,(PRF8) + \epsilon 1} \quad (4)$$

5 Discussion of results

5.1 Successful completion of project without adverse environmental issues

Based on the results exemplified in Table 6, *successful completion of project without adverse environmental issues* was considered as the most important driver of project reputation for construction organisations. This is rightly so because, in the light of recent global sustainability agenda, construction organisations have come under severe criticism because they consume the most portion of natural resources and also generate the highest portion of landfill waste (Ajayi *et al.*, 2017; Gbadamosi et al., 2019). Sapuay (2016) argues that when these landfill wastes (construction materials' packaging, equipment parts) are improperly managed, they can cause irreparable and irreversible adverse impact on the environment. To this effect, negative project reputation will be established when the health and welfare of populaces such as site workers and residents in the vicinity of the construction's site are affected. To prevent this occurrence and the negative reputation that will ascribe to it, construction organisations must be environmentally compliant when delivering projects because judging project performance now transcends merely meeting project objectives and client satisfaction. Being environmentally compliant on a construction site could be in the form of site management functions such as strict adherence to project drawings, ensuring fewer or no design changes during the construction process, provision of waste skips for specific materials and maximisation of on-site reuse of materials (Ajayi *et al.*, 2017). As such, completing a project without adverse environmental issues will develop the project reputation of construction organisations.

5.2 Competent project manager

The second most important driver of project reputation for construction organisations is a *competent project manager* (see Table 6). This result corroborates studies such as Hyväri (2006), Lechler and Dvir (2010) that a competent project manager is crucial when seeking optimum project delivery. Ahadzie et al. (2008) argues that a project manager is a person who is effectively in charge of the project and has sufficient authority, personality, and reputation to ensure that everything that needs to be done for the benefit of the project is done. By exemplifying traits such as leadership, decision-making, team building, a competent project manager is able to steer a project towards positive project reputation by developing mitigating plans to overcome inevitable difficulties. The importance of a competent project manager is echoed by a PriceWaterhouseCoopers (2014) survey which revealed that higher-performing projects are significantly more likely to be staffed with competent project managers. Similarly, Dulaimi (2005) and Munns and Bjeirmi (1996) argue that with a competent project manager at the helm of a project, there is high likelihood of successful completion of the project. Evidently, this process-related factor is quite important for construction organisations because project performance practically lies in the hands of the project manager because he/she will employ competent subcontractors, project participants and motivate them towards meeting project objective and goals (Toor and Ogunlana, 2008).

5.3 Friendly culture generated within project

Further evidences from Table 6 suggest that *friendly culture generated within projects* was considered as the third most important driver of project reputation for construction organisations. Owing to the multiplicity of project participants involved in a construction project, Khalfan *et al.* (2007) argues that project performance is contingent on their maintained rapport throughout the project life-cycle. For instance, Finlay and Mitchell (1994) argue that a friendly culture within a project environment can be beneficial for the project because it can promote good working condition that will enable project participants to discharge their responsibilities appropriately. Furthermore, Foss (2007) contends that a friendly culture can foster knowledge sharing among project participants which can ultimately boost the job-competence of each participant, thereby having an advantageous effect on project performance. By doing so, Wang and Noe (2010) notes that project participants can share task information, solve problems and resolve confusions quickly. This would, in turn, create a collaborative and mutual work environment, open to constructive criticism which would lead to better communication and reduced conflict (Rego *et al.*, 2007). Evidently, "*friendly culture generated within project*" is a key driver of project reputation for construction organisations because it can propagate a good working environment while the absence of it can cause discord among project participants which may lead to project termination/failure.

5.4 Competent project participants

Going further, results in Table 6 show that the fourth most important driver of project reputation for construction organisations is *competent project participants*. This result buttresses the indication of previous research studies such as Skulmoski and Hartman (2010) and Loo (2002) that ensuring all project participants are competent is vital when executing a project because they are the main catalyst of project performance. While noting this, it is pertinent to note that a project in its entirety is too complicated for one participant to accomplish individually, rather, a combination of participants is needed for effective project delivery. As such, it is essential to ensure that all project participants are competent, because if a project participant is not job-competent, the project is likely to be delayed and will not meet its project objectives. In addition to being job-competent, project participants should also be interpersonally-competent because it will foster good working condition which will ultimately propel them to discharge their duties appropriately (Finlay and Mitchell, 1994). Owing to an array of project participants from different backgrounds, there is bound to be a clash of ideas/interests. However, it takes a competent project team to exploit this cross-cultural environment to their advantage to foster cross-cultural ideas which will further innovation. As such, a competent team will be able to make integrative decisions to identify the requirements of complex projects, overcome project obstacles, successfully meet objectives, and surpass client expectations with greater pace (Laufer *et al.*, 1996).

5.5 Successful completion of project without adverse health and safety issues

Evidence from the study reveals that the fifth most important driver of project reputation for construction organisations is *successful completion of project without adverse health and safety issues* (see Table 6). According to research studies such as Aminbakhsh *et al.* (2013) and Reyes *et al.* (2014) and Ajayi *et al.* (2018), the construction industry is bedevilled with health and safety risks because of its complex, dynamic and unique scenery where uncertainties are prevalent. For instance, the UK Health and Safety Executive reports that 555,000 workplace injuries were sustained by onsite construction workers, while 144 workers were killed (HSE, 2018). As a result of incessant workplace injuries/deaths, HSE (2018) reports that 30.7 million working days were lost in 2017/18. However, it is pertinent to note that workplace injuries/deaths do not only affect employee's quality of life; it also damages the employer's (construction organisation) productivity, finances and reputation. This consequence is exemplified in the case of the explosion at Deepwater Horizon which was found to be as a result of vaguely established health and safety rules. The disaster at Deepwater Horizon not only cost BP almost $45 billion, but resulted in the plummeting of their share prices as a result of the negative reputation of the disaster. As such, completing a project without adverse health and safety issues is a desirable eventuality that will develop the project reputation of construction organisations.

5.6 Regular client consultation

Finally, the sixth most important driver of project reputation for construction organisation is *regular client consultation*. The theme of regular consultation among project participants on construction projects has been stressed in most research studies as being vital to project performance (Toor and Ogunlana, 2008; Nguyen *et al.*, 2004; Chua *et al.*, 1999). According to Toor and Ogunlana (2008), regular consultation is indispensable between clients and project stakeholders such as contractors, subcontractors, consultants and designers. This relationship is particularly imperative because the client, who is usually the owner of the project knows his/her expectations of the ideal product/project/service. As such, contracted project stakeholders must aim to deliver the project to the client's satisfaction because it is one of the prerequisites for judging project performance. Hence, project stakeholders should be in permanent consultation with the client throughout the project lifecycle to discuss unforeseen needs, issues, problems and mutually liaise to make project changes. According to Toor and Ogunlana (2008) regular client consultation is exceptionally useful because it can help eliminate misunderstandings between the client and other project stakeholders and reduce non-productive efforts.

6 Implications for practice

Evidence suggests that the construction industry is a unique and complex scenery where working conditions are different from the business, information technology and production industry. Characteristics such as the custom-made nature of projects, involvement of many stakeholders and varying procurement systems make construction projects unique. Furthermore, the industry is overwhelmed by numerous constraint-criteria which include meeting time, budget, specifications client satisfaction, health and safety rules and environmental compliance rules. As such, to a large extent, the construction industry is incomparable to other industries such as IT or production (Toor and Ogunlana, 2008). In view of the above-mentioned ambiguities, there is probability that there will be more differences than similarities between the identified process-related drivers of project reputation on construction projects and projects in other industries. While this somewhat lack of transferability has been established, the identified process-related drivers of project reputation have far-reaching strategic implications for most construction organisations at organisational and individual levels. At an organisational level, the study suggest that construction organisations top echelon executives can leverage on the findings of this study to adopt strategic positions on projects before they commence. This could be the identification of impending developmental needs in terms of being up to date with the latest health and safety rules and environmentally-friendly techniques. This would allow them to prioritize critical issues that will unquestionably impact their project reputation during the implementation of the project plan. At an individual level, project managers will find the findings of this study valuable when seeking to achieve positive project reputation. As part of the findings of the study, competent project participants are the catalyst for project performance. Therefore, project managers must not concede to any form of nepotism, favouritism or cronyism when seeking to employ project participants because only competent project participants deliver projects effectively. This includes awarding bids to the right designer/contractor and employing competent participants.

7 Conclusion and Recommendations

This study emerged from the backdrop of the existence of two divergent lines of thought in project management which views projects as either a product or as a process. In line with this distinction, this study aligns with the process perspective by maintaining that project management is not entirely about the final output/product, but the success of various best practices, techniques and approaches, all of which are process-oriented. Using a mixed methods approach, the study sought to examine the key process-related drivers of project reputation of construction organisations from the perspective of UK construction practitioners which include architects, civil engineers, building engineers, structural engineers and quantity surveyors. This resulted in the identification of six key process-related drivers of project reputation for construction organisations. They include: successful completion of project without adverse environmental issues; competent project manager; friendly culture generated within project; competent project participants; successful completion of project without health and safety issues and regular client consultation.

The findings from this study provides the basis for a set of practical recommendations on how construction organisations can use their project's process to develop, improve and sustain their reputation. The target group for these recommendations are project investors, clients and senior management (i.e. project manager) who are responsible for making key decisions regarding a project's process lifecycle. As a project goes beyond the delivery of the final output/product, the abovementioned target groups are implored to: (1) have a construction environmental plan that adheres to environmental legislations by outlining how projects will avoid or mitigate effects of the construction project on the surrounding area. (2) award bids to the right designer/contractor and employ competent project participants free from nepotism, favouritism or cronyism. (3) leave no stone unturned by ensuring that health and safety issues are identified and appropriate mitigation strategies are identified, controlled and reviewed throughout the project's life cycle.

Notwithstanding the contribution of this study, it is pertinent to note that this research was conducted in the UK by exploring the experiential opinion of UK construction industry practitioners. Hence, findings from the study should only be considered valid in this particular context. Future research should consider exploring others countries to ascertain whether there is a concord or discord among the identified drivers of project reputation. Another line of inquiry that future research may focus on is to expand the comprehensive list of process-related factors influencing project reputation.

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