

# Effective Factors on Project Success in Malaysian Construction Industry

Amjad Pirotti<sup>1</sup>, Abolfazl Keshavarzsaleh<sup>2</sup>, F. A. Mohd Rahim<sup>3</sup>, and Norhanim Zakaria<sup>4</sup>

<sup>1</sup>PhDc, Centre for Building, Construction & Tropical Architecture (BuCTA), Faculty of Built Environment, University of Malaya, Jalan Universiti, 50603 Kuala Lumpur, Wilayah Persekutuan, Malaysia. Email: amjadpirotti@gmail.com (corresponding author).

<sup>2</sup>Former researcher, High Impact Research Centre, University of Malaya, Jalan Universiti, 50603 Kuala Lumpur, Wilayah Persekutuan, Malaysia. E-mail: abolfazl.keshavarz.saleh@gmail.com

<sup>3</sup>Associate Prof., Centre for Building, Construction & Tropical Architecture (BuCTA), Faculty of Built Environment, University of Malaya, Jalan Universiti, 50603 Kuala Lumpur, Wilayah Persekutuan, Malaysia. E-mail: azli@um.edu.my

<sup>4</sup>Senior lecturer, Centre for Building, Construction & Tropical Architecture (BuCTA), Faculty of Built Environment, University of Malaya, Jalan Universiti, 50603 Kuala Lumpur, Wilayah Persekutuan, Malaysia. E-mail: norhanimz@um.edu.my

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**Abstract:** Although success is a word that encapsulates a general and wide idea and it is challenging to provide a definite and a consensus definition from all individuals concerned, for many years, there has been a growing interest in identification of the success factors and the relationship with project success. In this research, the main objective investigates the relationship between top management, project mission, personnel, communication and Schedule/Plan and project success in construction industry in Malaysia. A survey was conducted among Managers and Employees of construction companies registered with Construction Industry Development Board (CIDB) of Malaysia and the correlation and regression analysis was carried out in order to test the hypotheses of the study. Key areas are now offered that practitioners and academics should further explore to contribute to the knowledge body on project success and to explore in more details which factors affect project success in construction industry in Malaysia.

**Keywords:** Project management, project success, construction industry.

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## 1. Introduction

Projects more often than not have a particular group of critical success factors when concentrated on, will lead to the probability of successful implementation (Kuen et al., 2009). However, if these factors are ignored, this may lead to project failure. The development and identification of success factors have been dealt with in project management literature since the 1980s. Many researchers have attempted to determine the success factors (Clarke, 1999; Cooke-Davies, 2002; Kirzner, 1979; Pinto and Slevin, 1989; Turner and Müller, 2003). The success of projects depends on many factors that might vary in terms of project size, type, environment and Specifications. It has been suggested that variables such as Information/Communication (Andersen and Jessen, 2000; Khang and Moe, 2008; Pinto and Slevin, 1989), Top Management Support (Cooke-Davies, 2002; Hyväri, 2006), Project mission (Belassi and Tukel, 1996; Hyväri, 2006; Khang and Moe, 2008), Personnel (Cooke-Davies,

2002; Winston and Eastaway, 2008) and Project Schedule/Plan (Hartman and Ashrafi, 1996; Lim and Mohamed, 1999; Müller and Turner, 2007) may affect project success. However, there is lack of study in term of a comprehensive framework encapsulating the factors influence project success. Furthermore, Winston and Pareja, (2008) and Cooke-Davies (2002), suggested further study on communication, top management, project mission, personnel, and project Schedule/ project plan. From the theoretical perspective, a study conducted by Unterhitzberger and Bryde (2019) highlighted context-related factors such as organizational justice and project performance as enablers for success, along with mediating role of key success factors in project management. Bakar et al. (2009) recommended extending the research to consider the factors impact project success from managers and employee's perspective. Recognizing the need to bridge these knowledge gaps to project success, this research adds to the literature by addressing the need for empirical research on the factors that may

affect project success in Malaysian construction industry. The main question of this study is:

Do communication, top management, project mission, personnel, and project Schedule/ project plan affect project success within Malaysian context? Does context-related definition of success matter?

**1.1. Project Success: An Overview**

Project success has moved back to the central part of project management research within the past decade (Carvalho and Rabechini Junior, 2015). The criteria of cost, time, and quality are of central importance in evaluating the performance and success of construction projects (Ahadzie et al., 2008; Chan and Chan, 2004; Chan et al., 2002). These criteria have been entitled; “the iron triangle” (Atkinson, 1999). Although these fundamental criteria have been remaining intact as time went by due to their convenience (Willard, 2005), they have been retrospectively criticized for being insufficient. Central to debate about criticisms have been implying on these criteria is that there are several reasons. For example; they are not really one homogeneous dimension (Shrnhur et al., 1997), and the root causes of productivity and quality deficits and losses are ineffective (Alarcón et al., 2001). Above all, seems there is a paradox in the essence of criteria natures as; time and cost are significant in meeting project resource constraints, however, quality is of central importance in meeting specifications (Shrnhur et al., 1997). To conclude, these criteria do not procure an adequate continuous improvement because the information gained usually comes late to take corrective actions. Project success, has roots in integrating project efforts considering aligning with short and long term specified goals. Therefore, strategic project management has been regarded as a critical factor for project success per se (Rodrigues and Bowers, 1996). Quality, cost and time have been known to be related to only delivery stage of each project to guarantee the efficiency (Atkinson, 1999), thereby, they have characterized as the basic criteria comprising internal factors of the efficiency of project management (Dweiri and Kablan, 2006). To sum up, these criteria have been highlighted to be mean of a short-term measure of success, particularly when time to market is essential (Shenhar et al., 2001). Success in project management has gone beyond its traditional

dimensions; many factors have been recently highlighted as main contributors of success such as managerial soft skills and liaison channels to communicate the way success is judged (Olawumi and Chan, 2019). Since the limitations of the traditional way of measuring success are, unquestionably obvious, then scholars and practitioners have become interested in introducing new success measures (Barber, 2004; Carvalho and Rabechini Junior, 2015; Ika, 2009; Jugdev and Müller, 2005; Samset, 1998; Shenhar and Dvir, 2007). For example, client satisfaction (Lim and Mohamed, 1999), stakeholder’s satisfaction (Belout, 1998; De Wit, 1988; Lim and Mohamed, 1999), interpersonal relations satisfaction within members of the project team (Pinto and Pinto, 1991), and the satisfaction of participants (Pocock et al., 1996). However, there are not extensive research endeavors in project management that surpassed outdated thinking in project success measurement. In addition, most put spotlight on industrial projects or were not able to articulate projects success criteria in construction as one might hope. From industrial projects vantage point, it has been revealed four distinct dimensions, encompassing; preparing for the future, business and direct success, impact on customer and project efficiency (Shrnhur et al., 1997). Later on in 2001, it was demonstrated the extent to which and how these dimensions diversify in accordance to time and the amount of prospective technological uncertainty in the context of the project (Shenhar et al., 2001). Fig. 1 schematically depicts the synthesized success dimensions considering the time frame.

All in all, Fig. 1. exhibits the dynamism of the evaluations of success and the alteration of the nature of success measurements within time. On the other hand, another study has been conducted in which the project, itself, has been divided into two stages encompassing; delivery, and post-delivery stage (Atkinson, 1999). Fig. 2 exhibits these two stages and how the project success is measured based upon, in details. Besides, in a recent study conducted by Pace (2019), it is emphasize that project management methodology has a weak correlation to project success. A consequence of such studies indicates that in order to guarantee success, there is a need to highlight traditional measures which are tableted in Fig. 1.

Project Success				
Time	Short-term goal	Medium-term goal	Long-term goal	Very long-term goal
Success cluster	Project efficiency	Impact on customer	Business and direct success	Future preparation
Key success indicators	Meeting: time, budgets, requirements goals	Meeting: performance target, technical specifications, functional requirements	Commercial success, market share, revenue and profits	Developing: opportunities, technology, techniques, products and markets for the future

Fig. 1. Four dimensions of project success (adopted from Shenhar and Dvir (2007); Shrnhur et al. (1997))

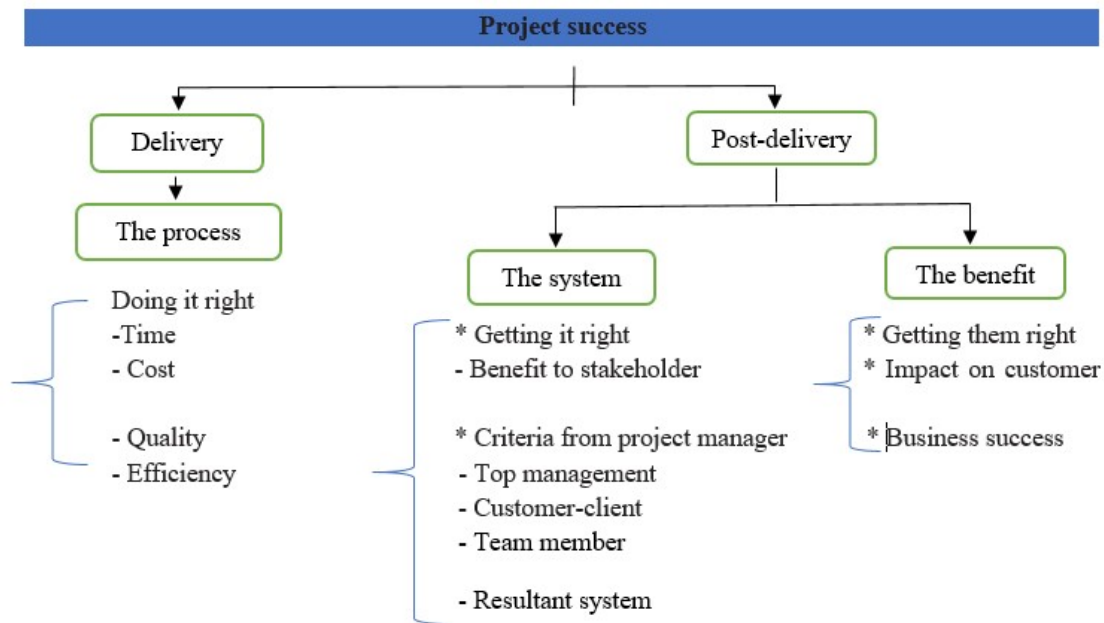


Fig. 2. Delivery and post-delivery stage of project success measurement (adopted from Atkinson (1999))

Recently, an integrated framework has been developed for project success assessment in project management as a new knowledge-based strategy (Todorović et al., 2015). This framework illustrates that analysis of project success, Key Performance Indicators (KPIs) and performance measurement processes, has a very beneficial impact on knowledge acquisition and project environment transfer. The aforementioned literature uncovers that significant contribution was produced to knowledge management (Atkinson, 1999; Shenhar and Dvir, 2007; Shenhar et al., 2001) and it reveals the evolutionary trend of moving from traditional way in measuring the success by focusing merely on time, cost, and quality. Unquestionably, since the success criteria vary from project to project (Hannola et al., 2009), then those measures do not address effective factors on construction project success. In addition, the distinction between what is the project management success and its service or product is also a key issue in the context of project success literature highlighted by several academics (Barclay and Osei-Bryson, 2010; Carvalho and Rabechini Junior, 2015; Cooke-Davies, 2002; Pinto & Slevin, 1988b; Shenhar and Dvir, 2007). There is empirical evidence that the study considering comprehensive framework on the factors that may success of projects, has been ignored and has not articulated as one might hope. In regard to, it has been suggested that variables encompassing information/communication (Andersen and Jessen, 2000; Khang and Moe, 2008; Pinto and Slevin, 1989), top management support (Cooke-Davies, 2002; Hyväri, 2006), project mission (Belassi and Tukel, 1996; Hyväri, 2006; Khang and Moe, 2008), personnel (Cooke-Davies, 2002; Winston and Eastaway, 2008) and project schedule/plan (Hartman and Ashrafi, 1996; Lim and Mohamed, 1999; Müller and Turner, 2007) are of most ought to when it comes to the project success along with the project management success. Therefore, scholars have been recommended further research on these matters either experimentally or theoretically (Bakar et al., 2009; Clarke, 1999; Cooke-Davies, 2002; Kirzner, 1979; Pinto

and Slevin, 1987; Turner and Müller, 2003; Winston and Eastaway, 2008).

## 1.2. Success criteria: Insights from Construction Projects

The concept of construction project success has remained opaquely interpreted (Brown and Adams, 2000; Chan and Chan, 2004). For instance, the construction project success has been scrutinized from both macro and micro vantage points (Lim and Mohamed, 1999). To pinpoint, macro deals with users and stakeholders' satisfaction and micro deals with project construction phase (i.e., where time, cost, performance, quality and safety are matter). Indeed, they have highlighted the significance of satisfaction and completion criteria (Lim and Mohamed, 1999), however, the view of the construction company's strategic objectives have not been taken into account. Some researchers have gone beyond the borders and synthesized the strategic effect of the project on other uncovered project success aspects. For example, the project success has been divided into two main components, namely the project management success and the product success (Baccarini, 1999). Fig. 3 exhibits this approach's components. However, the underlying strategic dimensions of project success were not uncovered and it was deployed within product success in all. In addition, other researchers (Chan and Chan, 2004) have introduced two clusters of indicators considering the construction project success. The first group represents the issues of safety, cost, time and environmental concerns. The second group refers to subjective measures encompassing functionality, satisfaction of various project participants, and quality. They have robustly tied success criteria with the performance indicators which are seemingly limited to tactical and operational levels of the project. Likewise, another researcher (Ahadzie et al., 2008) has introduced success criteria encompassing; time, environmental-impact, overall cost, quality and customers' satisfaction. However, the aforementioned criteria also were not targeted towards construction organizations' strategic objectives at all. In another

research attempt, the construction contractor's and the client's perspectives on project success have been compared (Bryde and Robinson, 2005). They have applied to five sets of success criteria encompassing customers' and stakeholders' satisfaction, cost, time, and meeting technical specification. These criteria were drawn from study by Tukel and Rom in which they have studied seventeen (17) types of projects considering cross-industry aims. Therefore, this means the study is not specifically point to construction projects (Tukel and Rom, 2001). In another case, the performance of

development projects has been evaluated in which the author (Blindenbach, 2006) proposed an interesting model encompassing two constructs of project success and market success. Fig. 4 exhibits the components of this model schematically. Although this framework significantly contributed to the knowledge, it failed to differentiate the project success and the project management success. Indeed, the distinction between the project management success and the project success is the most ought to (Cooke-Davies, 2002).

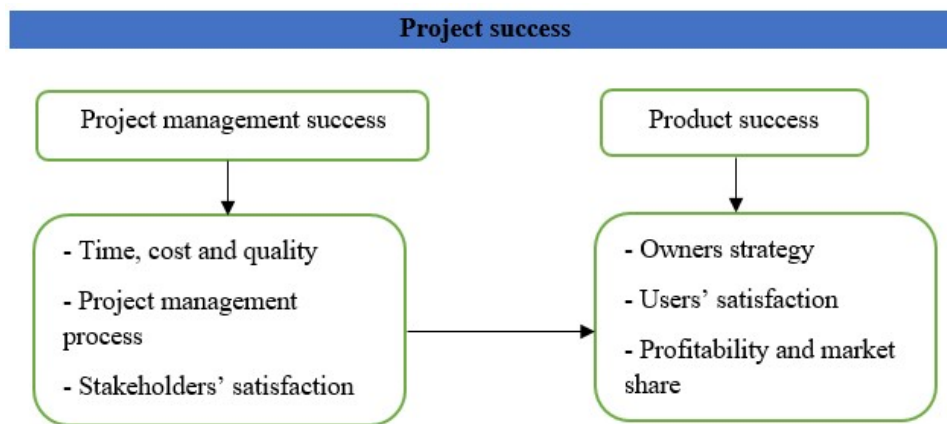


Fig.3. The components of project success (adopted from Baccarini (1999))

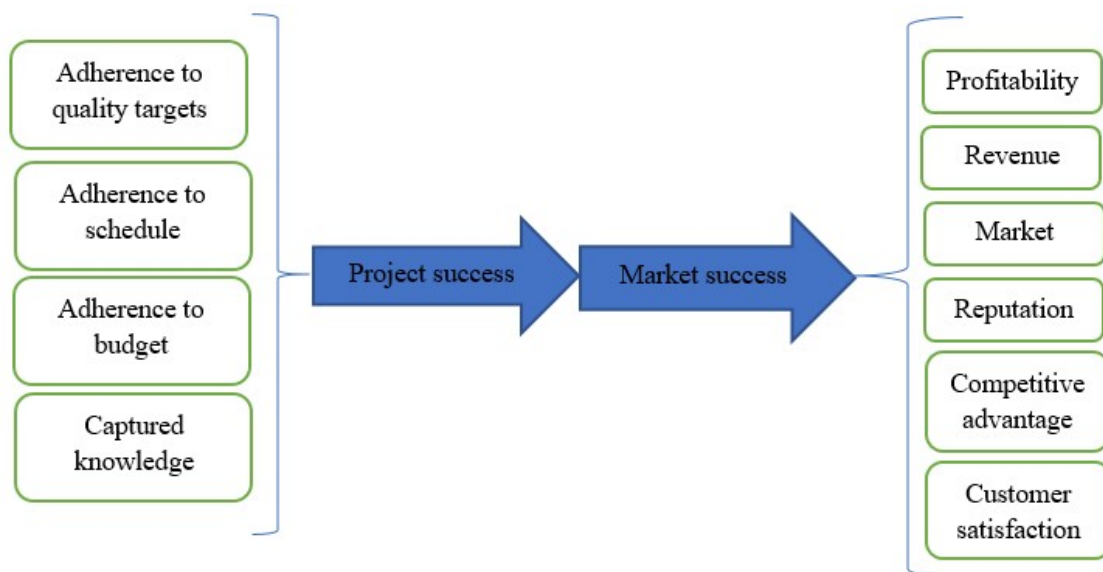


Fig. 4. Theoretical framework model adopted from Blindenbach (2006)

There seems to be a difference between project success and project management success; this difference can be seen while the expectations are not fulfilled in spite of using project management success criteria (Wideman, 2000). The project management success and the project success are two sides of the same coin. If the project obtained project success without consideration of the project management success, this puts a spotlight on the fact that in the long-term the project management would be of little importance (Munns and Bjeirmi, 1996) and it would be concluded that even better benefits could be realized (Cooke-Davies, 2004). There is empirical

evidence that several studies have been made great strides to introduce various models and frameworks for measuring the construction project success criteria. For example, the study was conducted considering reviewing 16 articles with the aim of preparation of the list of construction success criteria (Frödell et al., 2008). The author in his studies has originated success measures empirically encompassing; project goals, maintenance costs, profitability, finishing on time, and keeping the project within the budget. However, his study was constrained to clients' perspectives and had not addressed the view of contractors that could lead to distinct

measures, since project success can be interpreted differently from individual to individual (Chan and Chan, 2004; Freeman and Beale, 1992; Liu and Walker, 1998). Moreover, another researcher (Takim and Adnan, 2009) attempted to evaluate the performance of construction project with regards to effectiveness measures through uncovering five criteria, namely; operational assurance, stakeholder objectives, user satisfaction, learning and exploitation, and client satisfaction. Although these measures attempt to attain project goals and eventually align the outcomes of the project with requirement and satisfactions of customer; but all of these five (5) criteria should be incorporated with the strategic objectives and efficiency of the organization at all. Moreover, a hierarchical framework model has been developed for the project success in construction in which the author proposed three sets of criteria; owner, budget, designer and contractor (Elattar, 2009).. And the last but not least is the criteria from the contactors' vantage point (Elattar, 2009). Although the author has covered all matters comprehensively (Elattar, 2009), but the designation between success criteria and success factors remains opaque. For example, communication, supersizing acceleration issues, and minimizing and minimalizing construction problems and aggravation in producing a building has been ignored. Recently, within Malaysian construction context, the research has been conducted considering a categorization scheme for success criteria for building projects (Al-Tmeemy et al., 2011). The results indicated that the success criteria categorization for projects in construction should include product success, project management success, and market success categories. Although they have made great strides to characterize future criteria for success of building within Malaysia's construction context, but they failed to also

scrutinize the significant role of factors encompassing; information/communication (Andersen and Jessen, 2000; Khang and Moe, 2008; Pinto and Slevin, 1989), top management support (Cooke-Davies, 2002; Hyväri, 2006), project mission (Belassi and Tukel, 1996; Hyväri, 2006; Khang and Moe, 2008), personnel (Cooke-Davies, 2002; Winston and Eastaway, 2008) and project schedule/plan (Hartman and Ashrafi, 1996; Lim and Mohamed, 1999; Müller and Turner, 2007) which are of most ought to when it comes to the project success along with the project management success. Subsequently, proposed success criteria models and frameworks could not match with the needs of the well-coordinated construction industry's expectations. Consequently, identifying the role of factors which affect construction project success considering communication, top management, project mission, personnel, and project Schedule/ project plan is greatly needed (Bakar et al., 2009; Belout and Gauvreau, 2004; Clarke, 1999; Cooke-Davies, 2002; Kirzner, 1979; Pinto and Slevin, 1988a, 1989; Turner and Müller, 2003; Winston and Eastaway, 2008).

**2. Theoretical Framework**

A research framework has been used in this study to outline possible courses of action and to present a preferred approach to an idea and thought. Research framework, as a basis of the research problem, indicates all the constructs (concepts), definition, and propositions that relate to a research problem. This study primary focuses on exploring the factors that may affect project success in construction companies in Kuala Lumpur, Malaysia. Based on the literature review and research problems, an integrative framework (Fig. 5) has been developed.

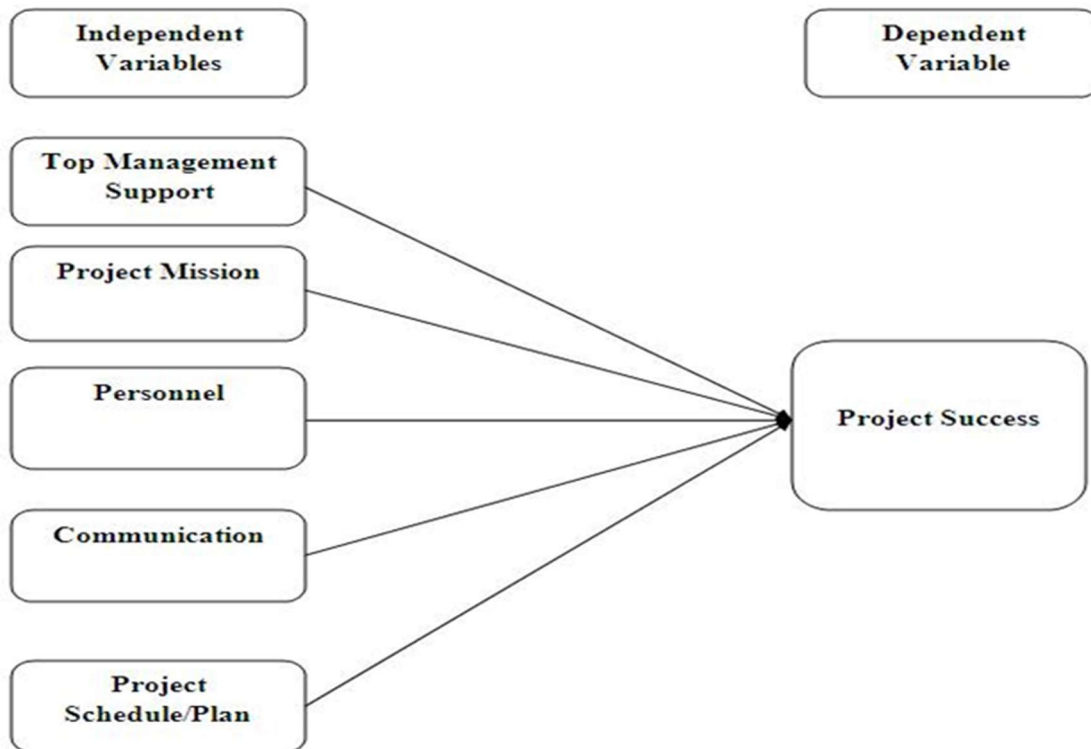


Fig. 5. Theoretical framework

This research attempts to examine the impact of communication, top management, project mission, personnel, and project Schedule/ project plan on project success. This study has five hypotheses based on the literature review to investigate the relationship between the variables.

H1: A positive relationship exists between top management support and project success.

H2: A positive relationship exists between project mission and project success.

H3: A positive relationship exists between personnel and project success.

H4: A positive relationship exists between communication and project success.

H5: A positive relationship exists between project schedule/ project plan and project success.

### 3. Research Methodology

#### 3.1. Sample and Population

The population of this research is represented by managers and employees of construction companies registered with CIDB (Construction Industry Development Board) in Kuala- Lumpur, Malaysia. Simple random sampling has been used by the researchers to efficiently apply to all employees and managers from the construction. Researchers then used the computer to select the necessary respondents from the whole construction sector list and the questionnaire distributed to the chosen sector in order to collect the data on the factors that may affect project success. The sample size, using simple random sample calculator, was determined according to Peduzzi et al., (1996). They stated that the sample size approximately should have ten (10) cases per variable to be reasonably stable which has been used to calculate the number of respondents in the current study: Variables \* 10= n in which the sample size would be 60 considering of having 6 variables in this current study. The sample size of this study is one hundred and fifty respondents, determining using at least 100 as a sample size, this study includes additional cases to achieve the statistical conditions.

#### 3.2. Data Collection and Analysis Techniques

Sekaran (2003, 2006) highlights that, questionnaires are the most commonly used technique of data Collection in social science research which has been used in this research due to its suitability in data collection. In the current study, personal administration of the questionnaires is carried out. Data is obtained from managers and employees working in construction companies registered with CIDB in Kuala Lumpur, Malaysia. The study involves guidelines on the cover page to explain how to complete the survey and to ensure the anonymity of the participants. The survey was conducted in November and December 2014. Most of respondents completed the questionnaire with the presence of researcher immediately after they listened to the explanations and instructions which was the purposes of filling the questionnaire to reduce the rejection of the respondents. One hundred and fifty questionnaires were distributed to the managers and the employees. Since the response rate was quite high and had met the

requirements for data analysis, therefore, there was no need for additional respondents to be chosen. The collected data entered into the Statistical Package for Social Sciences (SPSS). The descriptive analysis has been used to describe the characteristics of the sample and multiple regression analyses have been used to test the hypotheses as appropriate. A summary of respondents' background is illustrated in Table 1.

**Table 1.** Respondents' background

Variable	Frequency	Percent
<b>Gender</b>		
Male	135	90.0
Female	15	10.0
<b>Ethic Group</b>		
Malay	58	38.6
Chinese	52	34.6
Indian	26	17.3
Other	14	9.3
<b>Education Level</b>		
Primary /Secondary	37	24.6
Professional	46	30.6
University	67	44.6
<b>Experience</b>		
Less than 5	21	14.0
Between 6-10	65	43.3
11-15	49	32.6
More than 15	15	10.0
<b>Age</b>		
Less than 25	34	22.6
Between 25-30	41	27.3
Between 31-35	52	34.6
More than 35	23	15.3

### 4. Findings and Discussion

A correlation test is generally utilized for inferential statistics. In the present study, the Pearson correlation is utilized measuring the linear bivariate significance among dependent and independent variables to assist the study's objectives (Sekaran, 2006). Correlation is a bivariate association metric that indicates the strength of the connection between two variables varying from 0 (random relationship) to 1 (perfect linear relationship) or -1 (perfect negative linear relationship). Generally, it is reported according to its square ( $r^2$ ), and interpreted as the percentage of variance explanation (Hair et al., 2006). Findings show Project success's significant positive correlations (0.797) with Communication. In addition, it also presents Personnel's significant correlation with a high value of (0.622), Project mission's significant correlation with a value of (0.606) and Project schedule/Plan's significant positive correlation of (0.005), nevertheless, top management support signifies more correlation with Project success with a great value of 0.875.

Linear regression analysis was conducted to find out whether the five studied independent variables impacts project success in construction industry in Malaysian context and the outcome of this analysis determined the acceptance or rejection of our pre-defined hypothesis.

Linear regressions are carried out in the determination of the impact of communication, top management, project mission, personnel, and project Schedule/ project plan

upon project success in the construction industry in Malaysia. To determine the proportion of the variance distribution, linear regressions were employed. According to Tabachnick and Fidell (2007), whether variance distribution is continuous, or normally distributed, or which variable is explained or associated by two or more variables based on their associations can be determined by linear regressions (Tabachnick et al., 2001). Four direct paths are taken by linear regression to determine which variables explain the most significant and the greatest variance's proportions. The adjusted  $R^2$  value for top management, project mission, personnel, communication, and project schedule/ project plan are equal to 0.765, 0.367, 0.387, 0.636, and 0.019 respectively. Therefore hypotheses 1, 2, 3, and 4 are accepted and hypothesis 5 is rejected. Project schedule/ project plan adjusted  $R^2$  value is equal to 0.019 indicating that the variance in Project success (1.9%) is explained by project schedule/project plan and according to Cohen (1988) it is a low predictor effect upon dependent variable. The outcome of the analyses confirms that all predictors have a significant impact on project success. Table 2 contains the summary of the hypothesis testing.

**Table 2.** Summary of the hypotheses

No.	Hypotheses	Result
1	A positive relationship exists between top management support and project success	Accepted
2	A positive relationship exists between project mission and project success.	Accepted
3	A positive relationship exists between personnel and project success	Accepted
4	A positive relationship exists between communication and project success	Accepted
5	A positive relationship exists between project schedule/ project plan and project success	Rejected

## 5. Conclusion

There are multiple aspects to project success which generally calls for both general and collective awareness of a broad element encapsulating human, budgetary and technical variables. Additionally, projects have a specific set of critical success factors that if concentrated on may result in the possibility of the achievement of a successful project and if ignored or overlooked, may lead to project failure. Projects are generally utilized in the construction industry and hence, it is imperative that factors contributing to success of project and their relative importance should be identified. It is necessary to understand what factors are considered by construction industry in order to improve the productivity that may help the projects to be successful. The present study attempted at identifying and determining the impact of five factors on project success in the context of the construction industry in Malaysia. The significant positive relationships between communication, top management, project mission, personnel, and project success and negative relationship between project schedule and project success, show the importance of the fact that what factors may affect project success.

The definition of success across various country's context may worth to be undertaken. Success and its often-

interpretations have been substantially studied within the project management context; however, there is not a context-oriented definition of success. Despite this study being limited to Malaysia context, however, in some aspects, the lessons learned can be generalized.

The researchers suggest the following steps as below:

1. It is necessary to explore in more details what other factors are important to the project success in the construction industry in Malaysia.
2. It is necessary to understand how the factors interact with each other in the sustainable construction environment which is still new and not enough proactive actions have been taken to develop the construction sector in sustainable way.
3. Construction industry should take the steps to promote the managers and the employee's knowledge and skills on project success within the industry which could be the key to project success.

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Amjad Pirotti, a professional with over 16 years of cross-industry experience and excellent track record in project management across the globe. With a proven record of managing projects in different industries, from concept to completion, Amjad Pirotti has been actively involved in academia and various industries in the past decade. With a master of science in project management, he has held different positions in industrial organizations and academic institutions as project manager, trainer, researcher as well as R&D supervisor with cross industry knowledge and skills. Amjad is a PhD candidate in Project Management at University of Malaya and holding a Master of Science in Project Management. Beside his educational background, in the last few years, he has been leading Academies and learning and development departments, developed and delivered workshops and training in areas such as Project Management, Business and Blockchain technology.



Abolfazl Keshavarzsaleh is a former research assistant in High Impact Research Centre in University of Malaya, Malaysia. He is expertise in Project Management, Applied Neuroscience, Applied Mathematics & swarm Intelligence (Bee Colony Algorithm & Ant Colony Algorithm).



Associate Professor Sr. Dr. Faizul Azli Mohd Rahim is at the Department of Quantity Surveying, Faculty of Built Environment, University of Malaya, Kuala Lumpur. He graduated with BSc (Hons) Quantity Surveying from the University of Salford, UK in 1997, and received MSc IT in Property & Construction from the same university in 1998. He graduated with a Phd from the University of Liverpool in 2011 in the area of project risk management. Since his appointment at the University of Malaya, he had been teaching various subjects such as data analysis, construction economics, project management and IT in construction. He is a Registered Quantity Surveyor with The Board of Quantity Surveyors Malaysia (BQSM). He also hold various administrative positions such as the Head of

Departments and Deputy Dean (Research & Development) for the faculty. He had published in various local and international journals, as well as being the reviewers for international journals. His research interest were mainly construction economics, IT in construction and project management.



Dr. Norhanim Zakaria holds the Bachelor of Quantity Surveying from UTM, She attained her Master of Science in Construction Management from Universiti Teknologi Malaysia in the year 2000 and Doctoral degree in Project Management from UTM in 2011. She is now persuading her research interest in project management and construction economics. She worked with the industry for almost 4 years

prior joining UM, as an Assistant QS. Ever since joining UM as a Senior Lecturer in 2002, Dr Norhanim has published journal articles, including ISI, and books. She also has contributed articles in newsletters and bulletins, and presented papers in conferences locally and internationally. She was awarded the 'UM Excellent Award' in 2013. She has worked as a Principal Investigator and as a co-researcher for external and internal grants. Dr. Norhanim is a Registered Provisional Quantity Surveyor of Board of Quantity Surveyors Malaysia. Currently, she is supervising 4 PhD candidates and 2 master (by coursework) students, and has completed supervising 1 PhD, 2 master (by research) and 16 master (by coursework) students.