

# Critical Factors on Performance of Building Construction Projects (A Case of Kitengela-Kajiado County Kenya)

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**Abstract:** *Construction industry is one of the most important sectors that stimulate economic growth in any country. An increasing trade activity in Kenya has created a great demand for more and better infrastructure such as road networks, communication, buildings and utilities such as power, water and sewer systems. From an economic point of view, construction industry has become one of the most vibrant economic sectors in Kenya today and has attracted a large number of investors. Delays in completion of building construction projects are a problem that has been observed globally. The objective of this study is to investigate the effects of critical factors on successful delivery of building construction project in Kitengela, Kajiado County in Kenya. To achieve the objectives of the study, a descriptive survey design was used. The study applied a stratified random sampling technique to select 20 projects. The target population consisted of 20 clients, 20 consultants and 20 contractors drawn from the sampled construction projects. The study used primary data, which were collected using a semi-structured questionnaire. Data were analysed using descriptive statistics, chi-square test and the relative index of importance. The results of the study showed that there was a significant relationship between experience of the project manager and the success of the project, which implied that project success was dependent on experience of the manager. The study also found that a statistically significant relationship between government regulations and successful completion of building projects existed. The study therefore recommends that project designs should be developed by competent consultants and be discussed by all stakeholders before final draft is completed and implemented, this will reduce the number of change orders during construction phase that normally results to high cost overruns.*

**Keywords:** critical factors, project performance, building construction projects, stakeholder engagement, project manager, external environment, project consultants

## 1. Background of the Study

Construction industry is one of the most important sectors that stimulate economic growth in any country (Ortiz, 2009). According to Economic Watch (2010), this industry's contribution to global GDP is estimated to be 10% and the total amount of all resources that are used in construction sector sums up to about 50% of the world resources. It is therefore necessary to ensure that the processes within the construction industry are prudently and effectively managed; bearing in mind the impact this industry has in the world economy. Owoko (2013), argued that developments in this industry are rapidly increasing in many aspects, some of them are the technological complexity and size of the projects, different demands from stakeholders and the need to cope with the interdependencies of activities within a project. The most important underlying factor to note is that the built environment provides a significant contribution to the GDP of any nation, this directly points to the magnitude and impact that this industry plays in the world's economy in general. Weiss and Potts, (2012) noted that there has been continuous use of projects as a measure of a sound strategic management of an organization. The cost and duration of time taken to complete a project and deliver to a satisfied client determines its success. This successful completion is as a result of good management decision such as cost containment, project scope and quality (Seddon, 2008).

Bing, Akintoye, Edwards & Hardcastle (2005), in a study they conducted in the United Kingdom, noted that the

success factors for public-private partnership (PPP) projects are; implementation capacity of project participants, prudent procurement practice, favourable socio-economic environment and reasonable guarantees from the government.

In Africa, United Nations Conference on Trade and Development (UNCTAD), conducted a study to determine achievement of (NEPAD) New Partnership for Africa's Development in construction sector. It was noted that there were many serious costly delays in project implementation and delivery in most countries; this was directly tied to poor project scheduling in term of time, quality and cost containment.

According to Republic of Kenya (2010, a) economic survey, the construction sector is estimated to have 5% contribution to the national GDP and 10% on employment nationwide. The demand in this sector is valued at 50% according to (Ortiz, Castells & Sonnemann, 2009), this figure can be considered as a very significant contribution from a single sector. It is also estimated that 10% of the national budget goes to infrastructure provision (Republic of Kenya, 2011).

## Performance of Building Construction Projects

Many organizations especially multinational businesses consider Kenya at the center of vibrant trade and financial activities in the whole of East Africa, (Muchungu, 2012). As a result of this, Nairobi has played host to many large multinational trade firms. With the increasing trade

activities in Kenya, there has been great demand for more and better infrastructure such as roads networks, communication, buildings and utilities such as power, water and sewer systems (KPDA, 2015). The Kenya Government through the National Treasury has set aside large sums of funds to improve over 60 infrastructure projects in the country using Public Private Partnership (PPP) approach (National Treasury, 2017). Private sector through KPDA has also been busy putting up building structures like the large estates, malls and business parks to cope with the increasing demand from new business corporates.

From the economic point of view, construction industry has become one of the most vibrant economic sector in Kenya today and has attracted a large number of investors especially from the Far East (Nyongesa, Musumba & Chileshe, 2017). Some of the reasons why Kenya construction industry has been very vibrant are that the improved economic status of medium level income group has pushed up the demand for improved permanent housing units and flats in urban and sub-urban areas. The other reason is that the adoption of modern and alternative building materials has encouraged local investors and individuals to construct housing units which are durable, safe and affordable for the citizens.

### **Building Construction Industry in Kitengela (Kajiado County)**

Kitengela is one of the four sub-counties within Kajiado County, it is a plain area covering about 18, 292 ha, the original inhabitants are the Maasai community. In 1988, the Group ranch was subdivided to its 214 registered members to encourage private land ownership. Due to this the subdivision, the sale of land continued rapidly and its population rose from 6548 in 1989 to 58, 167 in 2009.

Due to high population in Nairobi city, and the development of government structures to the counties, a good number of people and investors have opted to shift to the metropolis of the city in search of cheaper land and cleaner environment, and in an effort to avoid the hustle and bustle of the city. According to KPDA, (2015), there is a high concentration of building construction activities spearheaded by large financial institutions, real estate developers and micro finance institutions. The report states that as of now Kitengela has hosted many financial institutions and sacco which have bought most of the prime land and are constructing buildings for their sacco members. Examples include Stima Sacco, Afya Sacco, Jamii Bora bank, Safaricom sacco and Waumini sacco,

### **Statement of the problem**

In any project, the project managers work together with the project team to achieve one very specific goal which is a successful project execution. This success is achieved if the project is completed within time, budget and good quality to customer's satisfaction.

Delays in completion of building construction projects are a problem that has been observed globally. Due to

inherent challenges of production in this industry, it has been noted that, tasks that were intended to be done procedurally are sometimes adjusted by some individuals haphazardly without considering other stakeholders' views and opinion (Radosavljevic and Horner, 2002). A review of literature has determined that some of the factors that are critical for a successful project completion are, commitment of client, cohesiveness of consultants, experience of project manager, support from top management, commitment of contractor to quality and economic stability (Yong, 2013).

According to Muchungu, (2012), building construction in Kenya have shown poor track record of 48% success rating in terms of scheduled time, cost containment and good quality.

The ranking of success and delay factors as noted by various scholars in previous review has shown some inconsistencies. Some factors that are ranked as most critical in one study were being ranked as insignificant in another studies conducted in another region which has a different economic and development environment. Based on this reason, this study was carried out and viewed from a Kenyan context to determine if the results will be same as what was noted in the previous studies. The findings of this study will seek to establish critical factors that influence successful project completion among the project team members on which factors have more impact on project success.

## **2. Objectives of the Study**

The main objective of this study was to assess the effects of critical factors on successful delivery of building construction project in Kitengela, Kajiado County in Kenya.

### **Specific objectives of the Study**

The proposed study had the following objectives:

- 1) To establish the influence of project manager related factors on successful delivery of building construction project in Kitengela, Kenya.
- 2) To determine the influence of consultant related factors on successful delivery of building construction-building projects in Kitengela, Kenya.
- 3) To assess the influence of contractor related factors on successful delivery of building construction projects in Kitengela, Kenya.
- 4) To establish the effect of environmental related factors on successful delivery of building project in Kitengela, Kenya.
- 5) To determine the influence of client related factors on successful delivery of building construction project in Kitengela, Kenya.

### 3. Literature Review

#### Theoretical Review

Theoretical framework is a set of concepts or ideas that are related and can be used to assist or guide a research project or any other business proposal.

#### Theory of Constraints

The proposed study uses the theory of constraints by Goldratt (1984). The theory of Constraints (TOC) was advanced by Eliyahu M. Goldratt in his publication titled *The Goal*, in 1984. It is basically geared to help organizations consistently and continually achieve their intended objectives. In 1997, Goldratt published another book titled *Critical Chain*, which elaborated the concept of project management. It states that management systems are limited in attaining their goals by a limited number of constraints. The theory assumes that organizations can be measured and controlled by variations in throughput, operational expenses and inventory (Sebastian, 2011). Building construction projects are achieved by use of limited resources hence same principles are employed so that the resources are used in such a way that there is maximum utilization of the same in the most cost-effective manner. This enhances the delivery of building construction project within stipulated time, cost and good quality. TOC views constraints from a positive perspective. Instead of viewing constraints as inhibitors to achievement of set objectives, they are assumed to determine the performance of a system while gradually improving the system's performance. TOC as a management theory provides a unique scientific management approach. As brought out by the theory, complex human based systems can be simplified while keeping the essential issues under managerial control. In construction projects, TOC provides a unique perspective to evaluate how variables like project management, procurement & finance, consultants, project manager, contractor, client and environment affects successful delivery of these projects (Yang, 2003).

#### Systems theory

The term system theory originates from Bertalanffy (1993). It states that organizations are social systems. Real systems are open to and interact with their environments. The different parts/elements within and around the organization intermingle to affect the way organization operate and therefore strategy implementation. It can be argued from a system's approach to strategic management that many of the reasons for strategies failure may be attributed to the successive dominance of different reductionism approaches to strategic management. Such partial approaches to project management ignore the complex, embedded and dynamic nature of today's organization (Kalman, Falb & Arbib, 2009).

The relevance of system theory approach in project implementation is that it helps managers of organizations to have to understand the customer, better predict environmental reaction, estimate resource competence,

and coordinate strategic project activities, obtain management commitment, estimate time requirements, ability to follow the plan, manage the strategic change and ensure effective communication.

#### Empirical Literature Review

Construction industry has been characterized as dynamic in nature and this has resulted in the increase in uncertainties in technology, budget and development procedures. From the literature review, Gunduz Nielsen and Ozdemir, (2013) conducted a study in which they identified various factors and clustered them into eleven groups of factors, namely; factors related to client, factors related to project management, factors attributed to consultants, factors attributed to procurement practices, factors related contractors, factors attributed to design, factors related to equipment, factors related to external environment, factors related to labour, factors related to materials, factors related to human behaviour. In this study, these factors were re-clustered and reduced to five groups of factors, they were project manager related factors, consultant related factors, contractor related factors, client related factors and environment related factors.

#### Project Manager related factors

The use of project management techniques is very important in construction industry, the coordination and use of different types of labour force, materials and equipment which is in operation daily requires a project manager with good of project management techniques (Phua and Rowlinson, 2004).

Previous studies agreed that project manager factor also have played a very significant role when assessing the level of success for a given building construction venture. The competency level of a project manager has been found to be very significant attribute in this factor.

#### Consultant Related Factors

The technical consultants constitute the civil engineer, quantity surveyor, structural engineer, mechanical engineer, electrical engineer and the architect as lead consultant. Each of these consultants' deals with different technical aspects but none can do without the other. According to Zuo and Zhao (2014), the attributes in factors related to consultants are complexity of the project, consultants' experience and effectiveness in production of design drawings.

Omran (2012) in the study conducted in Libya identified and ranked attributes in consultant related factors as, team cohesiveness; experience of consultants, accurate designs, material estimates and effective execution of design changes. Olawale and Sun (2010), noted that poor estimation of completion time, unclear contract documents, misinterpretation of project contract and scope as causes of delay under consultant-related.

**Contractor related factors**

Previous studies have shown that some of the factors that affect building construction projects are; inexperienced labor force, lack of materials, poor project planning and lack of appropriate construction equipment. Some studies have been conducted to these critical factors in order to determine their relative effect on any building construct project.

Aibinu and Odeyinka (2006), noted that the attribute that are associated with the contractor related factor are; the contractor’s funding inability, frequent construction equipment malfunction, inadequate work scheduling and planning, lack of adequate construction materials, inappropriate resource mobilization and lack of qualified manpower.

**External Related Factors**

Previous research has shown that factors related to external environment play a major role in successful completion of building construction project. According to Aibinu and Odeyinka (2006), unpredictable climatic conditions, stringent regulations by authorities, slow issuance of permits and hash political environment are

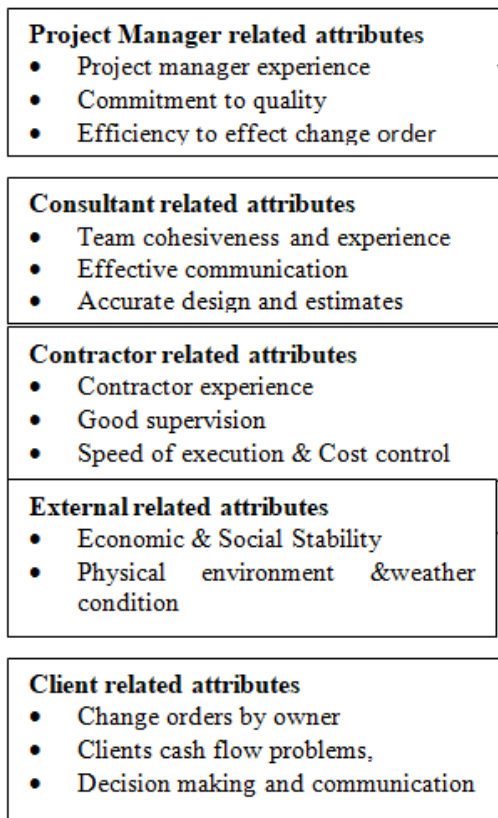
some of the attributes that contribute to project delays. Assaf and Al-Hejji (2006), concluded that slow process of permit approvals, nature of ground such as underground water table, extreme hot weather conditions, lack of essential utilities, heavy rains that cause floods, interference from local communities, uneven underground profile, change of government regulations, unstable economic environment and unexpected legal disputes are some of the factors that impact negatively in successful completion of building construction projects.

**Client related factors**

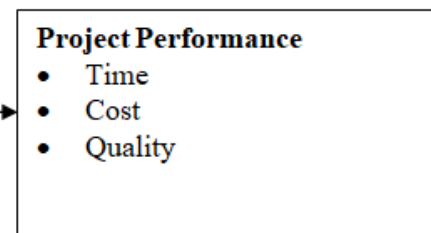
Further review of the literature revealed that client related factors play a very significant role in successful delivery of building construction projects. Aibinu and Odeyinka (2006) noted that frequent alteration of designs by client, financial capabilities of client and delays in arriving to a conclusive decision are the main factors that affect timely completion of projects. Another study conducted by Assaf and Al-Hejji (2006), revealed that client complacency, unclear instruction by clients, lack of cohesiveness between joint partners and lack of financial support to contractors were some of the critical factors that slow down timely execution of building projects.

**Conceptual Framework**

**Independent variables**



**Dependent Variable**



Source: (Researcher, 2018)

**4. Research Methodology**

To achieve the objectives of the study, a descriptive survey design was used. The study applied a stratified

random sampling technique to select 20 projects. The target population consisted of 20 clients, 20 consultants and 20 contractors drawn from the sampled construction projects. The study used primary data, which were

collected using a semi-structured questionnaire. Data were analysed using descriptive statistics, chi-square test and the relative index of importance.

The researcher involved all members in the population since the population size was small, that is all the 20 building projects were involved in the study and hence all the clients, consultants and contractors were targeted by the study. Kothari (2004), concluded that one doesn't have to resort to sampling when the population is small since all items are covered, nothing is left to chance and therefore the excellent results are likely to be achieved.

After the process of data collection by use of questionnaires, it was edited to ensure that it is comprehensive and complete. This information was then coded and analyzed using Statistic Package for Social Science (SPSS). The rating of each variable given by the participants was then inserted into the system; consequently the participants' views from the 42 questionnaires were analyzed statistically. In this study, relative importance index (RII) technique was used to evaluate the extent in which each independent variable contributes to the project success by calculating its level of importance.

Johnson and LeBreton, (2004), stated that RII helps one to find how much a certain variable contributes to the prediction of a criterion variable, not only by itself but also with other predictor variables put together.

To test the hypothesis, the independent chi-square was used in this study. The test was used to establish the relationship between critical factors and successful completion of building projects. The P-Values of results of the chi-square test was used to test for significance of the relationship between variables. The significance level used is 0.05 (5%) to test for significance where any P-value of less than 0.05 indicates a significant relationship.

The data was also subjected to regression analysis to ascertain the strength of relationship between each independent variable and the dependent variable. Regression analysis predicts the change that occurs in the dependent variables because of the independent variable/s (Montgomery, 2015).

## 5. Research Findings

### Ranking of the five Independent Variables

After calculating the mean RII among the five critical success factors in delivery of building construction projects (table 4.9 below), consultant related factor was found to be the most critical factor with a mean RII of 0.818 followed by contractor related factors at 0.798 and third with a mean RII of 0.785 was client related factors. Additionally, project manager related factors was fourth important at 0.710 and the least factor was external related factors at 0.676.

**Table 4.1:** Ranking of all the FIVE critical success factors

Factors	1	2	3	4	5	ΣW	RII	RII mean & (Rank)
<b>Consultant related factors</b>								
Accurate design and estimates	0	0	3	9	30	195	0.929	0.818 (1)
Effective communication	0	1	15	14	12	163	0.776	
Team cohesiveness & experience	0	2	16	15	9	157	0.748	
<b>Contractor related factors</b>								
Contractor experience	0	0	7	16	19	180	0.857	0.798 (2)
Good supervision	0	1	4	28	9	171	0.814	
Speed of execution & Cost control	0	6	11	18	7	152	0.724	
<b>Client related factors</b>								
Change order by owner	1	8	11	16	6	144	0.686	0.776 (3)
Client cash flow problems	0	5	3	6	28	183	0.871	
Decision making and commitment	0	2	15	12	13	162	0.771	
<b>Project mgr related factors</b>								
Project manager's experience	0	1	14	21	6	158	0.752	0.710 (4)
Commitment to quality	0	4	15	15	8	153	0.729	
Efficiency to implement change order	0	11	13	15	3	136	0.648	
<b>External Related Factors</b>								
Government Regulations and approvals	0	4	4	17	17	173	0.824	0.676 (5)
Economic & Social Stability	1	10	17	11	3	131	0.624	
Physical environment & weather condition	0	14	19	7	2	123	0.586	

Source (Researcher, 2018)

**Table 4.2:** Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.884 <sup>a</sup>	.781	.779	.00343

a. Predictors: (Constant)

From the regression, the R value was 0.884 indicating that there is a very strong positive relationship between the

independent variables and project success. The R squared (R<sup>2</sup>) value of 0.781 shows that 78.1% of the determinant

of project success delivery is explained by the independent variable. The remaining 21.9% is explained

by other factors put in place in order to enhance project success.

**Table 4.3:** Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.098	.176		.559	.577
1 Experience (X <sub>1a</sub> )	.488	.048	.525	10.143	.000
Commitment (X <sub>1b</sub> )	.436	.048	.458	9.002	.000
Efficiency (X <sub>1c</sub> )	.151	.021	.111	7.190	.018
Accurate designs (X <sub>2a</sub> )	.491	.048	.622	10.229	.001
Communication (X <sub>2b</sub> )	.463	.047	.474	9.851	.016
Team cohesiveness (X <sub>2c</sub> )	.212	.032	.313	6.625	.000
Contractor experience (X <sub>3a</sub> )	.478	.049	.520	9.755	.012
Good supervision (X <sub>3b</sub> )	.456	.043	.488	10.604	.000
Speed of execution & Cost control (X <sub>3c</sub> )	.130	.030	.232	4.333	.011
Gov. regulations (X <sub>4c</sub> )	.481	.048	.545	10.021	.001
Economic (X <sub>4a</sub> )	.426	.046	.469	9.260	.000
Physical conditions (X <sub>4b</sub> )	.200	.031	.210	6.452	.000
Cash flow problems (X <sub>5b</sub> )	.483	.045	.519	10.733	.000
Decision making (X <sub>5c</sub> )	.441	.044	.460	10.023	.003
Change orders (X <sub>5a</sub> )	.180	.036	.155	5.000	.001

a. Dependent Variable: Project Success

The established regression equation was;

$$Y = 0.098 + 0.488X_{1a} + 0.436X_{1b} + 0.151X_{1c} + 0.491X_{2a} + 0.463X_{2b} + 0.212X_{2c} + 0.478X_{3a} + 0.456X_{3b} + 0.130X_{3c} + 0.426X_{4a} + 0.200X_{4b} + 0.481X_{4c} + 0.180X_{5a} + 0.483X_{5b} + 0.441X_{5c}$$

## 6. Summary, Conclusions and Recommendations

### Summary

This study has provided a comprehensive review of the effects of critical factors on successful delivery of building construction project in Kitengela, Kajiado County in Kenya. The study showed that there was a statistically significant relationship between the project success and the critical success factors of the study (consultant related factors, Contractor Related Factors, Client Related Factors, Project Manager Related Factors and External Related Factors).

Further, the study noted that project manager’s experience was the most important attribute of project related factors that influenced project success. This leads to the need of ensuring that projects are managed by individuals who are competent and have requisite experience in the field of project management since they are the key players in the overall delivery of a successful project. The study also found out that accurate design and estimates were most significant attribute of consultant related factors that influenced successful completion of building projects. These points to the need of ensuring that consultants develop drawings that have clear details and dimensions to avoid misinterpretation. On external environment related factors, this study found that government regulations and approvals are the most critical attribute that contributes significantly to project success, this is an indicator that relevant Government departments should review its internal permit issuance processes to reduce delays. Contractor experience was the most important attribute of contractor related factors that influences project success, this finding leads to the need of ensuring

that contractors who are hired have requisite knowledge and experience to carry out the assigned project. On the client related factors, the study noted that client cashflow problems was the most critical attribute that influenced project success, this finding leads to the need for clients and project sponsors to ensure that there is adequate funding at every stage of the project lifecycle to enhance delivery of project objectives.

### 7. Conclusions

In conclusion, the research has determined that the successful completion of building projects depends on many issues with a variety of factors. Identification of these critical success factors particularly at the onset of the project, can help all stakeholders to determine significant factors that should be given special attention to ensure the success of the project. Furthermore, critical success factors can be considered to be a means to improve the effectiveness of building construction projects through the entire phase of the project life cycle. The study established that project success requires creating a well-planned project schedule, a well-coordinated project team as well as adequate funding and commitment from all stakeholders.

### 8. Recommendations

The study recommends that the lead consultant should ensure that the team is cohesive enough and that there is effective communication between the team and other stakeholders to enhance information flow regarding design details and project scope. Project designs should be developed by competent consultants and be discussed by all stakeholders before final draft is completed and implemented, this will reduce the many change orders

during construction phase that normally results to high cost overruns.

Regarding contactor related factors, the study recommends that contractors should have requisite skills, knowledge and experience to execute the project as per the consultants' recommendations. They should also be able coordinate well with consultants in ensuring that the bidding process for vendors and suppliers is done above board so as to enable competitive procurement of necessary materials and other hardware that are of good quality and that overall costs are controlled. The contractors should also be able to hire and deploy competent staff in their right areas of speciality and adequate machinery to ensure effective and efficient execution of assignment tasks within the stipulated time schedule.

It is also recommended that government regulatory agencies should enhance their building plan approval processes and issuance of permits. The National Construction Authority should also hire competent staff to periodically carry out inspections in construction sites at different stages to ensure compliance with the rules and regulations.

## References

- [1] Aibinu, A. A., and Odeyinka, H. A. (2006). Construction delays and their causative factors in Nigeria. *Journal of Construction Engineering and Management*, 132, pp.667–677.
- [2] Al-Khalil, M. I., and Karada, J. (2015). Important causes of delay in public utility projects in Saudi Arabia. *Journal of Construction Management and Economics*, 17 (5), pp.647 – 655.
- [3] Al-Kharashi, A., and Skitmore, M. (2009). Causes of delays in Saudi Arabian public sector construction projects. *Journal of Construction Management and Economics*, 27 (1), pp.3–23.
- [4] Al-Tmeemy, S. M. H. M., Abdul-Rahman, H., & Harun, Z. (2011). Future criteria for success of building projects in Malaysia. *International Journal of Project Management*, 29 (3), 337–348.
- [5] Assaf, S. A., and Al-Hejji, S. (2006). Causes of delay in large construction projects. *International Journal of Project Management*, 24 (4), pp.349–357.
- [6] Azhar, S. (2011). Building information modeling (BIM): Trends, benefits, risks, and challenges for the AEC industry. *Leadership and Management in Engineering*, 11 (3), 241–252.
- [7] Baiden, B. K., & Price, A. D. (2011). The effect of integration on project delivery team effectiveness. *International Journal of Project Management*, 29 (2), 129–136.
- [8] Belbin, R. M. (1981). *Management teams*. Routledge.
- [9] Berssaneti, F. T., & Carvalho, M. M. (2015). Identification of variables that impact project success in Brazilian companies. *International Journal of Project Management*, 33 (3), 638-649.
- [10] Bertalanffy, L. (1993). *General system theory*. New York, 41973 (1968), 40.
- [11] Bing, L., Akintoye, A., Edwards, P. J., & Hardcastle, C. (2005). The allocation of risk in PPP/PFI construction projects in the UK. *International Journal of project management*, 23 (1), 25-35.
- [12] CAHF (2012), Centre for Affordable Housing in Africa Yearbook 2012: Housing Finance in Africa – a Review of Some of African's Housing Finance Markets, Finmark Trust.
- [13] Chan AP, Scott D, Chan A. P. (2004). Factors affecting the success of a construction project. *Journal of construction engineering and management*; 130 (1): 153-155.
- [14] Chan, A. P., Lam, P. T., Chan, D. W., Cheung, E., & Ke, Y. (2010). Critical success factors for PPPs in infrastructure developments: Chinese perspective. *Journal of Construction Engineering and Management*, 136 (5), 484–494.
- [15] Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- [16] Doloi, H., Sawhney, A., Iyer, K. C., & Rentala, S. (2012). Analysing factors affecting delays in Indian construction projects. *International Journal of Project Management*, 30 (4), 479–489.
- [17] Economy Watch, (2010). *Contract Time Performance, Expectation and Reality*; Building Forum, Division of Building Research.
- [18] Faridi, A. S., & El-Sayegh, S. M. (2006). Significant factors causing delay in the UAE construction industry. *Construction Management and Economics*, 24 (11), 1167-1176.
- [19] Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. 4th Edition. Sage Publications Ltd.
- [20] Fisher, S. G., Hunter, T. A., & Macrosson, W. D. K. (2002). Belbin's team role theory: for non-managers also?. *Journal of Managerial Psychology*, 17 (1), 14-20.
- [21] Fugar, F. D., Agyakwah-Baah, A. B., & others. (2010). Delays in building construction projects in Ghana. *Australasian Journal of Construction Economics and Building*, 10 (1/2), 128.
- [22] Goldratt, E. M., & Cox, J. (1984). *The goal: excellence in manufacturing*. North River Press.
- [23] Gunduz M, AbuHassan MH., (2016). Causes of Construction Delays in Qatar Construction Projects. *World Academy of Science, Engineering and Technology. International Journal of Civil Environmental Structural, Construction and Architectural Engineering*. 10 (4): 492-497.
- [24] Gunduz, M., Nielsen, Y., & Ozdemir, M. (2013). Fuzzy assessment model to estimate the probability of delay in Turkish construction projects. *Journal of Management in Engineering*, 31 (4), 04014055.
- [25] Hair, J. F., Celsi, M. W., Ortinau, D. J., Bush, R. P. (2013). *Essentials of Marketing Research*. 3rd Edition. McGraw-Hill Irwin. USA.
- [26] Hardy, M. Bryman, A. (2009). *The Handbook of Data Analysis*. Sage Publications Ltd.
- [27] Hwang, B.-G., & Ng, W. J. (2013). Project management knowledge and skills for green construction: Overcoming challenges. *International Journal of Project Management*, 31 (2), 272–284.

- [28] Israel, D. (2008). *Data Analysis in Business Research: A Step-by-Step Nonparametric Approach*. Sage Publications Ltd.
- [29] Iyer, K. C., & Jha, K. N. (2006). Critical factors affecting schedule performance: Evidence from Indian construction projects. *Journal of construction engineering and management*, 132 (8), 871-881.
- [30] Jarkas, A. M., & Bitar, C. G. (2011). Factors affecting construction labor productivity in Kuwait. *Journal of Construction Engineering and Management*, 138 (7), 811–820.
- [31] Johnson, J. W. and LeBreton, J. M. (2004) History and Use of Relative Importance Indices in Organizational Research. . *Organizational Research Methods*, 7, 238-257