

# The Effect of Cost Overruns on Performance of Donor-Funded Construction Projects in Tanzania

Lazaro Kalamata

Jomo Kenyatta University of Agriculture and Technology, P. O. Box 62000-00200, Nairobi, Kenya

**Abstract:** *One of the main aims of any construction client is to procure a project within the limits of a predefined budget. However, most construction projects routinely overrun their cost estimates. Existing theories on construction cost overrun suggest a number of causes ranging from technical difficulties, optimism bias, managerial incompetence and strategic misrepresentation. However, much of the budgetary decisions- are earlier, approved in an environment of high uncertainty with little available information for accurate estimations. The purpose of the study was to assess the effects of cost overruns on performance of donor-funded construction projects in Tanzania. The study was conducted using a descriptive research design in order to portray an accurate snapshot of some aspects of prevailing situation of cost overrun. The population of the study involved all stakeholders of construction projects in World Vision Tanzania. They included construction company owners, Projects owners in this case World Vision's Tanzania Projects Managers, Consultants and Contractors. The study covered a sample size of 80 out of a population of 100 respondents. Questionnaires, interviews were used to collect data. The study revealed that cost overrun is a challenge in construction projects and mainly was caused by the lack of geotechnical studies before implementation, inaccurate estimates, cost of materials, poor contract management, new designing and new systems among others. The study concludes that, cost overrun is a real life occurrence in donor-funded construction projects and recommends that, pre-implementation detailed studies are important to avoid cost over or to reduce its severity on project performance.*

**Keywords:** Cost overrun, Donor-funded construction projects, Contract management, Project performance

## 1. Introduction

Construction has become an important player in the economy of many countries, especially developing countries. The construction sector in Tanzania contributed up to 12.5 % to the Gross Domestic Product (GDP) during 2014 with USD 6 billion, while in 2008 the sector accounted for 8.8% of the country's Gross Domestic Product or USD 1.9 billion. The growth rate of the Tanzania construction sector was 17.6% in Q3 - 2015 according to Tanzania National Bureau of Statistics (NBS). For this reason, it is considered vital for the economic development of the country. Moreover, the author also affirmed that construction activities have become a significant market because this industry procures products and material from other businesses in other sectors locally. Further, it is one of the most labor-intensive sectors and gives job opportunities to millions of citizens. The industry represents one of the most important sectors to the local economy.

### Purpose

The purpose of the study was to assess the effects of cost overruns on performance of donor-funded construction projects in Tanzania. Specifically the study sought to identify factors responsible for project cost overrun, impact of the cost over-run and effect of cost overrun of the performance of donor-funded projects in Tanzania.

## 2. Methodology

The study adopted a mix of descriptive research design. The purpose of descriptive research according to Saunders *et al.* (2004) is to portray an accurate snapshot of some aspects of particular individuals or a group of people. The study was classified as applied, exploratory and descriptive type. The study covered a sample of 80 out of 100 available contractors, consultants and company owners in the World

Vision Tanzania database. Data was collected through questionnaires, interview and documentary reviews. The analysis was done using descriptive statistical tools.

### Results and Analysis

The study achieved 100% of response rate. Among those who responded, 96% (77) were males while 4% (3) were female. This implies that construction projects are in most cases taken care of by men while few women can stay in or else they do office paper work. The analysis has shown a number of factors as major causes of cost overrun in construction of donor funded project.

#### *Lack of geotechnical studies before implementation*

The main purpose of Geo-Technical Investigation is to conduct soil investigation at the construction site and this is one of the major prerequisite actions to be implemented at the field of constructions before beginning the actual construction activity. Soil exploration determines suitability of the site proposed for construction. This mainly helps in knowing which type of foundation is required for the proposed project in order to making safety measures before piling. Normally if this prerequisite is not considered before the construction work begins, will eventually raise the cost of the construction project once becomes incompatible to what were assumed by the contractor and the site own.

#### *Cost of Material*

At a time when there is an absence of construction materials, the cost goes higher due to several importation barriers because importers in the country might set prices higher when they realize that, in the country there is a shortage of materials so that they can attract profit and if the materials are sold in the remote sites, the cost goes more than higher in price.

### ***Inaccurate estimates***

The study revealed that in most cases, cost control takes the form of firefighting to contain costs within the original allowances - the concept of putting cost efficiency at the forefront of every decision with a view to reducing ongoing costs) will bring your project home to a standard and cost that you are happy with, and the defect it leaves on the scheme is tangible.

### ***Poor contract management***

Poor contract management has been one of the reasons for cost overrun in a way that most of the project owners have proven inability to pay contractors within the agreed time as drawn in the contracts. The experience has been showing that this kind of a failure to comply with the paying terms as per the contract is also visible in most of the government construction project being road networks projects, buildings and many other types of construction. However, the interview has revealed that contractors are taking loans from financial institutions as their operating capitals. Each loan must have an interest of which they are required to pay it back with interest which raises up cost of materials.

### ***New design and new system***

It was argued that; in constructions projects, it is not necessary to have same structural designs, which means there are new designs and systems always in the building industry. Therefore, when copying the drawing with no relations to the site/ location where the structure is being constructed, there might be somewhat misleading the project and finally will result into a poor final output. Most of the Bills of Quantities (BOQ) are standard all over the country but they do not reflect the realities in different geographical locations according to varied soil textures and minerals in the soils. This will always require some adjustments to the BOQs for there will be needed like the foundation to go much deeper in the ground or sometimes the site might be a little bit rocky or wet in one way or the other hence more materials will be needed which might be different from what the BOQ suggests.

### ***High cost of machinery***

It is founded that, most of the contractors do not have enough capital to own construction machineries and instead they have to hire machines. Never the less, those machines are hired for very high prices and in most cases owners have no specific hiring cost for which is constant and they charge aside from transportations cost of the machines, leading to high cost of the projects. However, in the whole country few people own those heavy-duty machines and thus sets the hiring cost too high to afford for a given number of days especially when happens out of the expected project duration. In this way, the project cost overrun is unavoidable.

### ***Price fluctuations***

Changes or alteration of starting date of the project can highly affect price projects since the price of raw materials is always subject to change according to various economies of scale in the world market. For example if the project has been set to be, 2016/2017 should exactly be assured to start over and being implemented on the same time to avoid

changing prices the next financial year. If not done so, the project cost must change and overrun.

### ***Government taxation policy***

The government policy on taxation is a legal requirement and taxes are always consistent in most cases, but if tax was not considered during budgeting must cause a change to the cost of the project apart from the budget of the project, so it is better to make a prior consideration or otherwise, for donor funded projects there should be tax reliefs.

### ***Fraudulent practices***

Most of the contractors believe that, to win a tender you must bribe or practice fraudulent. Having that notion in mind, they always have to quote their price high enough so that they may not lose anything. This must cause construction project cost overrun.

### ***Unpredictable weather***

According to respondents experience in construction projects, they have all argued that unpredictable weather particular if it is cold weather can widely affect the cost lineup of the construction project. Activities like, Concrete mixtures do not set below a certain temperature, and therefore not all work involving the drying of cement can proceed below a certain temperature. This includes concrete foundations and slabs, brickwork and spreading. Therefore, contractors must wait until the temperature rise again to complete this part of work. Waiting until the temperature rise again means added cost of hired machineries, labor and all the like which means slowing the critical path of the project. Likewise since the ground is sodden it take to install high cost large sump pumps to attempt water removal. Other factors identified include, delay of interim certificate payment, delay of technical teams of engineers assigned to overseeing/supervising the contractor and involvement of technical teams during project budget setup.

### ***Impact of Cost Overrun***

Cost overrun has been a serious problem to most of the constructions projects to an extent of killing construction businesses in several ways despite the fact that construction projects is one of the greatest and paying business. This study has outlined some impacts of cost overrun. Respondents of the study agreed on the severity of the effects of cost overrun that the project owner (client) experience and all other stakeholders involved. However the most affected stakeholder is the project owner him/herself first since he has predicted his construction project to be comprehended within a billed cost and period, anything outside these stated frames are cost overrun and time overrun to the client. Not only that cost overrun affect those parties directly involved in the construction of a project, but the construction industry as a whole and subsequently to the national economy of the country.

Even if it is not common in the Tanzania construction industry to abandon a clients' construction project due to cost overrun, projects agonize excessive delay and the contractor must incur supplementary cost due to idle labor and idle equipment. Other consequences of cost overrun with great impact to the overall constructions projects are:- Project delays, Loss of reputation to the consultant, Migt

cause an new agreement, Confrontational relationship between participants of the project, And hence poor quality workmanship, Might cause dissatisfaction by project owners and beneficiaries, Beneficiaries negative attitude to the construction industry, Less contribution of construction industry to the National economy, Reduction of planned increase in property and service production, Creates skeptical outlook on appraisal of other new construction projects and Creates frustration to stakeholders.

Excessive cost overrun will eventually require additional budget, which in turn will spend the emergency available funds, and for public projects this has an implication to financial resources of the country, which will lead to further budget shortfall for construction projects all over. The table below shows the responses on how the respondents agree or disagree on the impact of cost overrun through the listed statements.

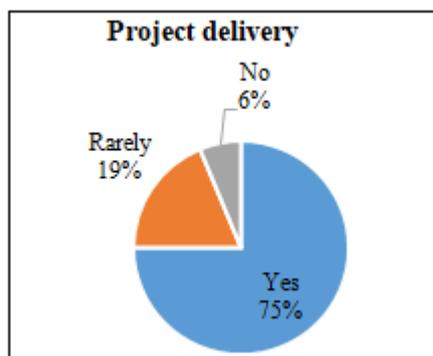
**Table 1:** Extent of the impact of cost overrun

IMPACT	SCALE		
	Agree	Undecided	Disagree
Delaying completion of the projects	79%	15%	6%
Overspending	88%	11%	1%
Degraded reputation of the project implanters	74%	14%	12%
Poor quality project deliverables	56%	28%	16%
Might cause a new agreement	83%	11%	6%
Beneficiaries negative attitude to the construction industry	50%	25%	25%
Creates frustration on stakeholders	71%	21%	8%
Donor withdrawal	62%	25%	13%
Failure to meet budget objective	87%	8%	5%

The study found that of all the respondents on average, have accepted on the statements about the impact of cost overrun in donor funded construction projects in the country. This is to say that cost overrun has major impact in the present and future development of the country's economy and all the beneficiaries of the project.

**Contractors' Performance Management**

The researcher was interested to know contractors projects accomplishments in order to know how cost overrun affect their performance in general. The findings have shown that most of them have been able to deliver their projects to clients but still others could not afford due to failure to manage the actual project cost. The study respondents responded the following questions "Have you been able to deliver the assigned construction project (work) on time"



**Figure 1:** Project delivery

The findings in Figure 1, shows that 75% of contractors have been able to deliver their assignments while 19% of them have said it has been unpredictable for them to deliver on time due to cost overrun and all other related contributes. On the other hand, those who have been able to deliver have argued that, it has been possible to deliver once the differences or mismatches of the project costs are sorted out as soon as after they have been noticed. On the other hand contractors are always used to cases of cost overrun in their encounter and for that reason they normally take precautions during project quotation stage knowing that anything can happen in between, in that case they have to quote higher than actual for them to remain with some profit but also to manage the expected deliverable. 6% of the contractors have not been able to deliver on time due to cost overrun and also delayed rectifications.

Contractors, who have not been able to deliver their projects on time, have declared that, it is because of the mismatches between the allocated budget as per the client's projections and the real construction project cost according to each individual site during the implementation. Another contribution factor is the inability of the client to pay on time and also an on time rectification of the mismatches. It was uncovered that; in most case, cost overrun results into;- contractors overspending increased mobilization and demotivation of construction machine on site, Delayed payment to contractors, Delayed payment for hired equipment, machines and labor, Lost reputation of construction companies especially laborers. This can also create dormant construction companies and losing trust in working with machines hiring companies.

**3. Conclusions**

Financial resources are so scarce in developing countries like Tanzania hence, cost related issues in donor funded construction projects are sensitive issues. Therefore, carrying out a research in this area will have a paramount importance. Knowing the key factors/causes of cost overrun is a prerequisite to minimize or to avoid cost overrun in the construction industry. Respondents of the study were all asked to identify causes, impact and measures against cost overrun. The analysis of the results from the closed and partly open-ended questionnaire was carried out using descriptive analysis. From the results of the analysis the following conclusions are drawn.

Cost overrun is a real life in construction projects in Tanzania. This is been argued by most of them for they have such an experience across the country for their experience in working with private, Non-governmental and Public projects. There are significant variations in the total amount of cost overrun for different donor funded construction projects. According to the responses, Irrigation canals, education building and water dams have the lowest rate of cost overrun. However, construction of bore halls and health facilities has been investigated to have the highest rate of cost overrun due to their details in nature as compared to the rest of the projects.

The causes of cost overrun include lack of geotechnical studies before project implementation, inaccurate

estimations, cost of materials, poor contract management, new designs and new systems, high cost of machinery, shortage of materials and price fluctuations. Others include Government policy on taxation that could not identify donor-funded projects, fraudulent practices, and involvement of complicated rules as well as unpredictable weather

Lack of geotechnical studies before project implementation was identified by all contractors as the most challenging of all because it matters a lot to assimilate all the estimates of the projects. If the pre-construction work is well done, the project can even spend less than it quoted, but if not done properly, there is a possibility of taking the cost too higher during implementation. Geotechnical study can determine the amount of materials needed to construct a project, the type of machineries needed, the level of skilled and unskilled labor, the time and or duration of the study and all others. However, each of the causing factors of cost overrun carries weight accordingly and has a great contribution to cost management.

#### 4. Recommendations

##### *For Consultants*

The Consultants should consider continuously coordinating and direct communicating to all involved stakeholders, providing comprehensive information required for easier interpretation of the drawings and setting out of the works. Standardize specifications for easy understanding, Carry out a detailed and comprehensive site investigation at the design phase, Procure construction materials and other items in a participatory approach with the clients ahead of time, Solve problems and propose solutions on construction projects proactively, Minimize adversarial relations with stakeholders on construction projects, Ensure efficient time management through proper resource planning, duration estimation, and schedule development and control; If those are taken care of, it will help to avoid delay and hence to avoid cost overrun due to delay.

##### *For Project Clients*

They should ensure comprehensive articulation and communication of owners and end-user needs and requirements during briefing sessions in a realistic and accurate manners, fulfill contractual obligations, especially on settlement of fees accounts of consultants and possession of construction site and ensure that, adequate funds are available before any project starts so that the contractor is paid in accordance with the contract agreement, should allow sufficient time to prepare project briefs and other feasibility studies, allow sufficient time for proper feasibility studies, planning, design, information documentation and tender submission. On the other hand, the client should employ professionals to work as counterpart with Consultants and Contractors in order to minimize delayed information and responsibilities between the contractor and the client. The client should also implement cost reduction incentive proposals to ask the government to offer a tax-free scheme for all donor funded projects to remove the problem of overseeing government policy on taxation issues. Or else during budgeting, Tax element must be taken into consideration as an important item so that it may not become

a burden during the implementation hence implementation budget cutoff.

##### *For Government*

The government should not impose high tax in order to discourage importation for local industries protection regardless their low capacity of production to meet the available demand. On the other hand is to say that, the barriers to imported construction materials should be observed and or lower the price of the materials by creating a sustainable environment for local investors of building materials production. Apart from that, the government should also conduct capacity building programs for professionals and firms on the construction industry and assist individuals, organizations and institutions in the construction industry on research and development of appropriate construction management techniques and technology, which will help to reduce problems, related with cost overrun. Finally, it is recommended that, all stakeholders in the construction industry have to work for improving the out puts of the construction industry and to sustain a healthy growth of the industry. Especially consultants, contractors and clients have to use a holistic approach for solving problems in the construction activities; they have to familiarize themselves to the latest technology and methods to solve problems and look for solution proactively as one team. Institutions and academicians in the construction industry have to work hand-in-hand with practitioners in the industry too to solve the problem of ineffectiveness in the industry.

#### References

- [1] Al-Tabtabai, H., Kartam, N., Flood, I. and Alex, A.P. (1997). Expert judgment in forecasting construction project completion. *Engineering Construction and Architectural Management* 4(4), pp. 271-293.
- [2] Ameh, O. J., Soyngbe, A. D., & Odusami, K. T. (2010). Significant Factors Causing Cost Overruns in Telecommunication Projects in Nigeria. *Journal of Construction in Developing Countries*, 15.
- [3] Aman Khan (2000), Cost and Optimization in government.
- [4] Arditi, D., Akan, G.T. and Gurdamar, S. (1985). Cost overruns in public projects. *International Journal of Project Management*, Vol. 3, Issue 4, pp. 218- 224.
- [5] Avotos, I. (1983). Cost-relevance analysis for overrun control. *International Journal of Project Management*, Vol. 1, Issue 3, pp. 142-148.
- [6] Baker, B.N., Murphy, D.C. and Fisher, D. (1983). Factors affecting project success. *Project management handbook*, pp. 902-919.
- [7] Baloi, D. and Price, A.D.F. (2003). Modelling global risk factors affecting construction cost performance. *International Journal of Project Management* 21(4), pp. 261-269.
- [8] Belassi, W. and Tukel, O.I. (1996). A new framework for determining critical success/ failure factors in projects. *International Journal of Project Management* 14(3), pp. 141-151.
- [9] Bryman, A. (2008). *Social research methods*. 3rd ed. Oxford; New York: Oxford University Press.

- [10] Chan, A.P.C., Scott, D. and Chan, A.P.L. (2004). Factors affecting the success of a construction project. *Journal of Construction Engineering and Management* 130pp.153.
- [11] Chan, D.W.M. and Kumaraswamy, M.M. (1997). A comparative study of causes of Time overruns in Hong Kong construction projects. *International Journal of Project Management* 15(1), pp. 55-63.
- [12] Chen, Y.Q., Zhang, Y.B., Liu, J.Y. and Mo, P. (2011). Interrelationships among Critical Success Factors of Construction Projects Based on Structural Equation Model. *Journal of Management in Engineering* 1pp. 67.
- [13] Chua, D.K.H., Kog, Y.C. and Loh, P.K. (1999). Critical Success Factors for Different Project Objectives. *Journal of Construction Engineering and Management* 125(3), pp.142-150.
- [14] De Wit, A. (1988). Measurement of project success. *International Journal of Project Management* 6(3), pp. 164-170.
- [15] Doloi, H.K. (2011). Understanding stakeholders' perspective of cost estimation in project management. *International Journal of Project Management* 29(5), pp. 622-636.
- [16] Eden, C., Williams, T. and Ackermann, F. (2005). Analyzing project cost overruns: comparing the "measured mile" analysis and system dynamics modelling. *International Journal of Project Management* 23(2), pp. 135-139.
- [17] Elinwa, A.U. and Buba, S.A. (1993). Construction Cost Factors in Nigeria. *Journal of Construction Engineering and Management* 119(4), pp. 698-713.
- [18] Enshassi, A., Al-Najjar, J., & Kumaraswamy, M. (2009). Delays and cost overruns in the construction projects in the Gaza
- [19] Enshassi, A., Mohamed, S. and Abushaban, S. (2009). Factors affecting the Performance of construction projects in the Gaza strip. *Journal of Civil Engineering and Management* 15(3), pp. 269-280.
- [20] Flyvbjerg, B., Bruzelius, N. and Rothengatter, W. (2003). *Megaprojects and risk: an anatomy of ambition*. Cambridge: Cambridge University Press.
- [21] Frimpong, Y., Oluwoye, J. and Crawford, L. (2003). Causes of delay and cost overruns in construction of groundwater projects in a developing countries; Ghana as a case study. *International Journal of Project Management* 21(5), pp. 321-326.
- [22] Gkritza, K. and Labi, S. (2008). Estimating Cost Discrepancies in Highway Contracts: Multistep Econometric Approach. *Journal of Construction Engineering and Management* 134(12), pp. 953-962.
- [23] Gray, D.E. (2004). *Doing research in the real world*. London: SAGE.
- [24] Iyer, K.C. and Jha, K.N. (2005). Factors affecting cost performance: evidence from Indian construction projects. *International Journal of Project Management* 23(4), pp. 283-295.
- [25] Jackson, S. (2002). *Project cost overruns and risk management*. The University of Reading.
- [26] Jergeas, G.F. and Ruwanpura, J. (2010). Why Cost and Schedule Overruns on Mega Oil Sands Projects? *Practice Periodical on Structural Design and Construction* 15(1), pp. 40-43.
- [27] Kaliba, C., Muya, M. and Mumba, K. (2009). Cost escalation and schedule delays in road construction projects in Zambia. *International Journal of Project Management* 27(5), pp. 522-531.
- [28] Kaming, P.F., Olomolaiye, P.O., Holt, G.D. and Harris, F.C. (1997). Factors influencing construction time and cost overruns on high-rise projects in Indonesia. *Construction Management and Economics* 15(1), pp. 83-94.
- [29] King, R. (2012). 'White elephant' London 2012 Olympics runs £2bn over budget as security costs double due to 'poor planning' since 7/7, *The Daily Mail*, Main Section ed, dailymail.co.uk.
- [30] Koushki, P.A., Rashid, K. and Kartam, N. (2005). Delays and cost increases in the construction of private residential projects in Kuwait. *Construction Management and Economics* 23(3), pp. 285-294.
- [31] Le-Hoai, L., Lee, Y. and Lee, J. (2008). Delay and cost overruns in Vietnam large construction projects: A comparison with other selected countries. *KSCE Journal of Civil Engineering* 12(6), pp. 367-377.
- [32] Leeman, T. (2007). Project Management: Managing the Chaos of Change. *Journal of Business Strategy* 23(5), pp. 5.
- [33] Love, P.E.D., Wang, X., Sing, C.-P. and Tiong, R.L.K. (2012). Determining the Probability of Project Cost Overruns. *Journal of Construction Engineering and Management* 1(1), pp. 438-438.
- [34] Mansfield, N.R., Ugwu, O.O. and Doran, T. (1994). Causes of delay and cost overruns in Nigerian construction projects. *International Journal of Project Management* 12(4), pp. 254-260.
- [35] McCabe, B. (2003). Monte Carlo simulation for schedule risks.
- [36] Morris, P.W.G. and Hough, G.H. (1987). *The anatomy of major projects a study of the reality of project management*. Chichester; New York: Wiley.
- [37] Nevan Wright, J. (1997). Time and budget: the twin imperatives of a project sponsor. *International Journal of Project Management* 15(3), pp. 181-186.
- [38] Odeck, J. (2004). Cost overruns in road construction—what are their sizes and determinants? *Transport Policy* 11(1), pp. 43-53.
- [39] Okpala, D.C. and Aniekwu, A.N. (1988). Causes of High Costs of Construction in Nigeria. *Journal of Construction Engineering and Management* 114(2), pp. 233-244.
- [40] Olawale, Y.A. (2010). Cost and Time Control Practice of Construction Projects in the UK: The Pursuit of effective management control. University of the West of England.
- [41] Olawale, Y.A. and Sun, M. (2010). Cost and time control of construction projects: inhibiting factors and mitigating measures in practice. *Construction Management and Economics* 28(5), pp. 509-526.
- [42] Pinto, J.K. (1990). Project Implementation Profile: a tool to aid project tracking and control. *International Journal of Project Management* 8(3), pp. 173-182.
- [43] Pinto, J.K. and Mantel Jr, S.J. (1990). The causes of project failure. *Engineering Management, IEEE Transactions on* 37(4), pp. 269-276.

- [44] Pinto, J.K. and Prescott, J.E. (1988). Variations in critical success factors over the stages in the project life cycle. *Journal of management* 14(1), pp. 5-18.
- [45] Raftery, J. (1994). Risk analysis in project management. Taylor & Francis.
- [46] Reichelt, K. and Lyneis, J. (1999). The dynamics of project performance: benchmarking the drivers of cost and schedule overrun. *European Management Journal* 17(2), pp. 135-150.
- [47] Rockart, J.F. (1982). The changing role of the information systems executive: a critical success factors perspective. *Sloan Management Review*, Vol. 24, Issue 1, pp. 3-13.
- [48] Simons, H. (2009). Case study research in practice. Los Angeles; London: SAGE.
- [49] Slevin, D.P. and Pinto, J.K. (1986). The project implementation profile: new tool for project managers. *Project Management Journal*, Vol. 17, Issue 4, pp. 57-70.
- [50] Syal, R. and Gibson, O. (2012). Olympic Games risk going over budget as cost hits £11bn, say MPs, *The Guardian*, guardian.co.uk
- [51] UK Contractors Group. (2009). Construction in the UK Economy: The Benefits of Investment.
- [52] Van Der Westhuizen, D. and Fitzgerald, E.P. (2005). Defining and measuring project success.
- [53] Walker, D.H.T. (1994). An investigation into factors that determine building construction time performance. Royal Melbourne Institute of Technology.
- [54] Yin, R.K. (2003). Case study research: design and methods / Robert K. Yin. 3rd ed. Sage Publications.
- [55] Yin, R.K. (2009). Case study research: design and methods. 4th ed. Los Angeles, Calif.: Sage Publications.
- [56] Wayne J del Pico (2013). Project control: integrating cost and schedule in construction