

## **Developing Leadership Skills for a Dynamic Construction Industry**

**Dr. Suat Gunhan, University of Texas, San Antonio**

Dr. Gunhan is currently an Associate Professor and Associate Dean for Research at The University of Texas at San Antonio.

# **Developing Leadership Skills for a Dynamic Construction Industry**

## **Abstract**

Today's construction industry is highly dynamic not only at the domestic but also international level. Technological advancements and sustainability requirements are transforming architecture-engineering-construction (AEC) industry. The necessity of collaboration in projects due to sustainability requirements have changed the project delivery dynamics. The popularity of design-build (DB) and its variations is increased since they facilitate a project process environment accommodating trust-based collaborative environment. Similar to domestic markets, there are many changing dynamics that affect the international construction arena. U.S. construction companies have a successful track record in international markets, and they led the international scene for many years due to their expertise in complex technical projects and their efficient project management skills. However, their revenue share in international construction is in decline since the early 2000s for various reasons. The paper investigates on the factors impacting construction projects delivery in both domestic and international markets and explores the desired leadership skills to manage dynamically transforming project delivery process. Acknowledging the necessity of a transformation in leadership approach, the paper also includes how the author incorporates the respective leadership skill development strategies into his course content. The strategies included joint capstone and design projects for construction and civil engineering students in an international setting (e.g. study abroad), developing the capability to perform life cycle analysis (LCA) by integrating engineering economics problems into Project Management course, inviting guest lecturers from the leadership team of construction companies, requiring groups of students to interview industry professionals (involving industry professionals) and team presentations in classroom.

## **Introduction**

Today's construction industry is highly dynamic not only at the domestic but also international level. Technological advancements and sustainability requirements are transforming architecture-engineering-construction (AEC) industry. The necessity of collaboration in projects due to sustainability requirements have changed the project delivery dynamics. The popularity of design-build (DB) and its variations is increased since they facilitate a project process environment accommodating trust-based collaborative environment. The recent study by Falls Management Institute is projecting 18% annual growth in DB for the next coming three years [1]. Similar to domestic markets, there are many changing dynamics that affect the international

construction arena. U.S. construction companies have a successful track record in international markets, and they led the international scene for many years due to their expertise in complex technical projects and their efficient project management skills. However, their leadership is in decline since the early 2000s for various reasons. The Chinese contractors have had the largest revenue volume share in international projects during the last decade. In addition to China, the increase in contracting volume of some contractors from newly industrialized countries (NICs) such as Korea and Turkey is remarkable.

The paper investigates on the factors impacting construction projects delivery in both domestic and international markets and explores the appropriate leadership skills required to manage dynamically transforming construction project delivery process. Consequently, the paper discusses the methods of incorporating the appropriate leadership skills' development addressing today's construction industry needs into construction curriculum. The author includes his own methods, the way he brings the development of leadership skills into the classroom. The methods include having collaborative projects with design students, incorporation of financial/engineering economics problems into project management course, and practicing verbal and non-verbal communication through presentations.

## **Literature Review**

Historically, AEC industry has been very fragmented and it is very common to have adversarial relationships especially when using traditional project delivery method. The traditional delivery method has been extensively used in domestic construction industry [2]. Considering the historical evolution of project delivery processes (from low level collaboration to high level collaboration among project participants), leadership research in construction has focused on transactional leadership and transformational leadership styles [3]. One of the major characteristics of transactional leadership is being task oriented, in other words, the leader expects from his/her followers to perform on the given tasks [4], [5]. The transformational leadership focuses more on the people skills side. Its characteristics include being visionary, charismatic, inspirational, and capability of influencing followers' values and attitudes in a positive manner [5]. There is a strong personal influence of the leader in transformational style. The leader is expected to be a role model for his/her followers and bring their best out of them. The followers are expected to go beyond their self-interests for the good of the project.

Today's AEC industry places big emphasis on the issue of collaboration and fragmentation is less favored. The main reason for that is the growing popularity of sustainable projects. Sustainability becomes a norm in AEC industry and it necessitates collaboration driven integrated process [6]. High degree of collaboration can be achieved through integrative delivery methods [7]. The major findings of a recent research study [8] indicate that design-build (DB) delivery method accommodate a collaborative project process environment which is the best delivery option possible especially if the design and construction teams are co-located. It is easier to nurture trust-based team communication in a project environment where the DB team is co-located [9]. Construction professionals and major specialty contractors such as mechanical,

electrical, and plumbing involve in the project much earlier during the phase. [7], [10]. Therefore, the leadership of construction project managers is required in early design phases.

The criticality of return on investment (ROI) in sustainable projects brings more responsibilities to contractors. Contractors are expected to provide life cycle analysis (LCA) while providing value engineering services. In order to provide precise LCA, the integration of BIM and its effective management is critical [11], [12]. Being a major representative of 21<sup>st</sup> century projects, sustainable projects require different kind of leadership from early design to post-construction phase. According to Zhao et al. [13] project managers who lead green building projects should not only be directive and task oriented but also people-skill oriented. Indeed, the management of green building projects requires many systematic procedures that necessitate being transactional but also requires lots of collaboration among different experts which necessitates people skills.

The dynamics have also changed in international construction during the last 15 years. For U.S. contractors, having advanced technology and project management skills may not be the only strength factors in order to gain competitive advantage. U.S. contractors successfully led the international construction arena until mid-2000s. However since, 2009 Chinese contractors have led the international construction scene (Figure 1).

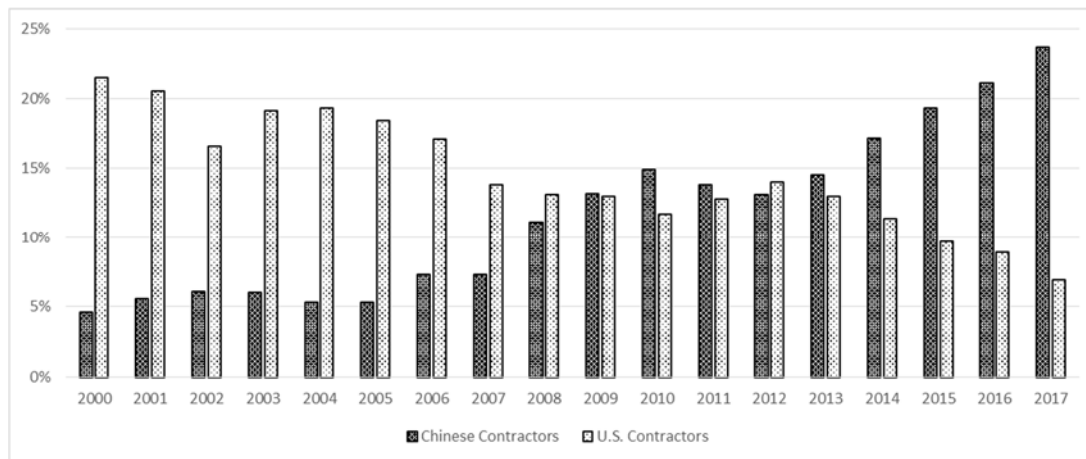


Figure 1. The Annual International Construction Revenue Percentages of Chinese and U.S. Contractors. Source: [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29], [30], [31].

Recent findings indicate that U.S. contractors can be more competitive in the Middle East and Asia by establishing joint ventures with companies that are active in those regions [32]. The trends indicate that companies from some of the NICs particularly China, Korea, and Turkey increased their percent revenue share in international construction [31]. Those companies are from Asia and the Middle East and while working in the Middle East and Asia, companies with eastern culture have advantages due to the proximity of their cultural distance [32]. These companies are not the cheap-labor suppliers anymore but they are competitors in technology oriented projects. They acquired competitive skills such as technology and project management in the last three decades through different mechanisms [33].

Another finding indicates that there is an increased level of expectation from international contractors to bring financing and deliver projects with build operate transfer (BOT), design-build-finance-maintain-operate (DBFMO), and public-private-partnership (PPP). One of the major reasons that Chinese contractors made a leap in international markets is because of their financing support through their government which can be instrumental in securing contracts when delivering projects implementing BOT, DBFMO, and PPP [32]. The financing capabilities coupled with cultural intelligence increase their competitive advantage. Cultural intelligence becomes a catalyst during the implementation of integrative delivery methods.

How do all these developments both in domestic and international construction affect the issue of leadership? The traditional paradigm of construction projects which is on time completion within budget and meeting the expectations of project specifications (the iron triangle) is always here to stay, therefore transactional and transformational leadership characteristics will always be applicable to construction project management [34]. However, the increased collaboration requirements in domestic projects, and the necessity of cultural intelligence in order to collaborate with diverse constituents in international projects requires additional leadership qualities.

Recent leadership studies in construction suggest that authentic leadership is the style that today's construction companies need to embrace without rejecting the transactional and transformational leadership styles. In fact, authentic leadership is perceived as the extension of transactional and transformational leadership styles [35], [36].

Authentic leadership has holistic ideals on projects. Authentic leaders' success criteria include the well-being of all project constituents. They consider all factors and circumstances that will provide the best for all constituents [37]. They are naturally influential on their followers, and their followers naturally perform their best and grow as leaders as well [38]. They are not necessarily charismatic people as observed in transformational leadership [39]. While leading projects, rationale is not the only way of life, they also lead with their hearts, and they establish true connectedness and trust-based environment for all project constituencies [40].

Today's fast pace project environment expects lots of collaboration skills, global cultural intelligence, and analytical skills in engineering economics in addition to technical and project management skills from project leadership. By its definition, the authentic leadership style could be a good style to adopt as a leadership style for today's construction industry. Cultivating this type of leadership can improve competitiveness in both domestic and international construction.

### **Incorporating Leadership into Construction Management Teaching**

Considering the dynamics both in the domestic and international construction markets, the author employs several strategies to bring leadership skills' development into the course content.

The College of Architecture, Construction, and Planning at the University of Texas at San Antonio has initiated a collaborative course for Construction Science and Civil Engineering students. Construction Capstone for construction students and Civil Engineering Design course for Civil Engineering students were offered in a merged course within an existing study abroad Program in Italy. The author teaches the Special Studies in Civil Engineering course in which the issues in international construction are intensely covered including the leadership skills. The instructor also assists the merged Construction Capstone and Civil Engineering Design course. Both Construction Science and Civil Engineering students work in teams (design-build teams). They work on an international design and construction project. All necessary leadership skills for international construction covered in Special Studies in Civil Engineering course are incorporated into the presentation skills' content of this course. While working together in a different country, they develop awareness towards the expectations of design and construction fields, work together to solve the project problems, more importantly they develop respect for each other's field of study. Eventually this type of an environment nurtures the development of authentic leadership style. They develop awareness on what is good, what is best for the project, rather than us versus them "fragmented" mentality. It also helps them to develop trust-based relationships since they naturally help each other because they adjust to a new culture and communicate not only during the course hours but also during the day.

The students provided positive feedback about their learning experience. This experience proved that having students taking collaborative project courses in study abroad programs can enhance their collaborative skills which is the main component of a leadership development. The collaborative project courses must be taught by both design and construction professors which creates unique learning experience for all students.

Inviting guest speakers who have leadership roles in construction organizations is a methodology that the author employs in his classes. Having role models from the leadership level and listening their approach to construction project leadership provides a unique opportunity for students as they learn from the example.

Having good communication skills is another major quality contributing to their leadership development. The communication skills' development is practiced in a collaborative team work environment. The teams (each team is composed of four students) interact with construction project managers by interviewing them. They ask questions about a problem (provided by the instructor). The project management problems include topics on the leadership applications of project managers and their impacts to project organizations. An exemplary topic is about exploring the involvement of CM team's during the design phase of sustainable projects and the impact of their leadership styles. Students are required to present their findings in class. Hence, what they have learned in class lectures is reinforced, and they are updated with the latest developments in project leadership. The whole class learn from each other through these presentations. This approach facilitates the development of communication, people, and collaborative skills and in overall it contributes to the leadership development. The classroom environment turns into a laboratory where the desired leadership characteristics of today's projects are discussed.

The recent dynamics in the construction industry bring the expectation of construction professionals' leadership starting from the early design phase and continuing through the post-construction phase which includes the "useful life" of a building. This expectation necessitates construction professionals to handle LCA problems. The curriculum does not include Engineering Economics course. Therefore, the author incorporates financial/engineering economics problems into Project Management course. Students learn how to make comparative analysis among different project alternatives. They are introduced to concepts such as time value of money, initial investment, life cycle costs, interest rates, minimum attractive rate of return, and useful life. Going beyond construction activities and developing awareness for the life cycle of a project is expected to develop a holistic view capability. Embedding an understanding of an effective life cycle period makes them curious about respective delivery methods that consider the whole life cycle of a building. Today's construction leaders must have a holistic view of the project life cycle spanning from design phase to the end of useful life of a building. The international owners expect from construction entities to bring single source solutions from finance to design, construction, maintenance and operation.

## **Conclusions**

The changing dynamics in both domestic and international construction necessitate a transformation in construction project leadership. AEC is considered fragmented industry, however the new developments necessitate collaborative and integrated work processes.

Recent literature review highlights the emergence of authentic leadership and its adaptation to construction industry. The paper included the rationale on why authentic leadership could be an alternative leadership style for today's domestic and international construction projects. The importance of collaboration and being able to work in an integrated project environment necessitate learning new skills such as developing an understanding of others' novice scope of work, and being able to work in joint venture projects that take place in diverse cultural environments.

Acknowledging the necessity of the required transformation in leadership approach, the paper also included how the author brings such skill development into his course content. The strategies included joint capstone and design projects for construction and civil engineering students in an international setting (e.g. study abroad), developing the capability to perform LCA by integrating engineering economics problems into Project Management course, inviting guest lecturers from the leadership team of construction companies, requiring groups of students to interview industry professionals (involving industry professionals) and team presentations in classroom.

## **References**

[1] Engineering News Record, "*Project Delivery: Studies Affirm Design-Build Speed, Cost, Future.*" November 19-26, 6, McGraw Hill, 2018.

- [2] McGraw Hill, Construction, "Project delivery systems—How they impact efficiency and profitability in the buildings sector." Bedford, MA (2014).
- [3] S. Toor and G. Ofori, "Leadership for future construction industry: Agenda for authentic leadership." *International Journal of Project Management* 26, no. 6 (2008): 620-630.
- [4] I. Winkler, *Contemporary leadership theories: Enhancing the understanding of the complexity, subjectivity and dynamic of leadership.* Springer Science & Business Media, 2010.
- [5] A. K. Tyssen, A. Wald and P. Spieth, "The challenge of transactional and transformational leadership in projects." *International Journal of Project Management* 32, no. 3 (2014): 365-375.
- [6] S. Mollaoglu-Korkmaz, L. Swarup and D. Riley, "Delivering sustainable, high-performance buildings: Influence of project delivery methods on integration and project outcomes." *Journal of Management in Engineering* 29, no. 1 (2011): 71-78.
- [7] S. Korkmaz, L. Swarup, M. Horman, D. Riley, K. Molenaar, N. Sobin, and D. Gransberg. "Influence of project delivery methods on achieving sustainable high performance buildings report on case studies." *The Charles Pankow Foundation* (2010).
- [8] S. Gunhan, "Analyzing Sustainable Building Construction Project Delivery Practices: Builders' Perspective." *Practice Periodical on Structural Design and Construction* 24, no. 1 (2018): 05018003.
- [9] R. Miller, D. Strombom, M. Iammarino, and B. Black, "The Commercial Real Estate Revolution: Nine Transforming Keys to Lowering Costs, Cutting Waste, and Driving Change in a Broken Industry." John Wiley & Sons, 2009.
- [10] P. Gultekin, S. Mollaoglu-Korkmaz, D. R. Riley, and R. M. Leicht. "Process indicators to track effectiveness of high-performance green building projects." *Journal of Construction Engineering and Management* 139, no. 12 (2013): A4013005.
- [11] S. Azhar, and J. Brown. "BIM for sustainability analyses." *International Journal of Construction Education and Research* 5, No. 4 (2009): 276-292.
- [12] G. J. Tulacz. "The Top 100 Green Contractors." *Engineering News Record*, 265 (77), 44-46, 2010.
- [13] Zhao, Xianbo, Bon-Gang Hwang, and Hong Ning Lee. "Identifying critical leadership styles of project managers for green building projects." *International Journal of Construction Management* 16, no. 2 (2016): 150-160.
- [14] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." *ENR*, 247(8), 66, 2001.



- [15] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 249(9), 26, 2002.
- [16] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 251(8), 28, 2003.
- [17] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 253(8), 34, 2004.
- [18] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 255(8), 40, 2005.
- [19] P. Reina, & G. J. Tulacz, C. J. Schexnayder, "The Top 225 International Contractors." ENR, 257(8), 28, 2006.
- [20] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 259(7), 30, 2007.
- [21] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 261(5), 32, 2008.
- [22] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 263(7), 36, 2009.
- [23] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 265(6), 44, 2010.
- [24] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 267(6), 45, 2011.
- [25] P. Reina, & G. J. Tulacz, "The Top 225 International Contractors." ENR, 269(6), 49, 2012.
- [26] P. Reina, & G. J. Tulacz, "The Top 250 International Contractors." ENR, 271(6), 44, 2013.
- [27] P. Reina, & G. J. Tulacz, "The Top 250 International Contractors." ENR, 273(5), 45, 2014.
- [28] P. Reina, & G. J. Tulacz, "The Top 250 International Contractors." ENR, 275(5), 33, 2015.
- [29] P. Reina, & G. J. Tulacz, "The Top 250 International Contractors." ENR, 277(6), 37, 2016.
- [30] G. J. Tulacz, & P. Reina, "The Top 250 International Contractors." ENR, 279(6), 33, 2017.
- [31] G. J. Tulacz, & P. Reina, "The Top 250 International Contractors." ENR, 281(5), 35, 2018.
- [32] S. Gunhan, "Improving Competitiveness in International Construction Markets." Accepted for publication in International Structural and Construction Conference – 10 (ISEC-10), Chicago, IL. May 20-25, 2019.
- [33] S. Gunhan, "Analysis of Changing Dynamics in International Construction." International Civil Engineering and Architecture Conference (ICEARC'19), Trabzon, Turkey. April 17-20, 2019.

- [34] S. Gunhan, "Identifying Project Leadership Characteristics for Sustainable Building Projects." 5th international Project and Construction Management Conference (IPCMC 2018), Cyprus. November 16-18, 2018.
- [35] B. J. Avolio, W. L. Gardner, F. O. Walumbwa, F. Luthans, and D. R. May, "Unlocking the mask: A look at the process by which authentic leaders impact follower attitudes and behaviors." *The leadership quarterly* 15, no. 6 (2004): 801-823.
- [36] B. J. Avolio and F. Luthans, *The high impact leader: Authentic, resilient leadership that gets results and sustains growth*. McGraw Hill, 2005.
- [37] D. R. May, A. Y. Chan, T. D. Hodges, and B. J. Avolio. "Developing the moral component of authentic leadership." *Organizational dynamics* (2003).
- [38] W. L. Gardner, & J. R. Schermerhorn, "Unleashing individual potential: Performance gains through positive organizational behavior and authentic leadership." *Organizational Dynamics*, 33, no. 3, (2004): 270-281.
- [39] S. R. Toor and G. Ofori. "Leadership for future construction industry: Agenda for authentic leadership." *International Journal of Project Management* 26, no. 6 (2008): 620-630.
- [40] B. George, P. Sims, A. N. McLean, and D. Mayer. "Discovering your authentic leadership." *Harvard business review* 85, no. 2 (2007): 129.