

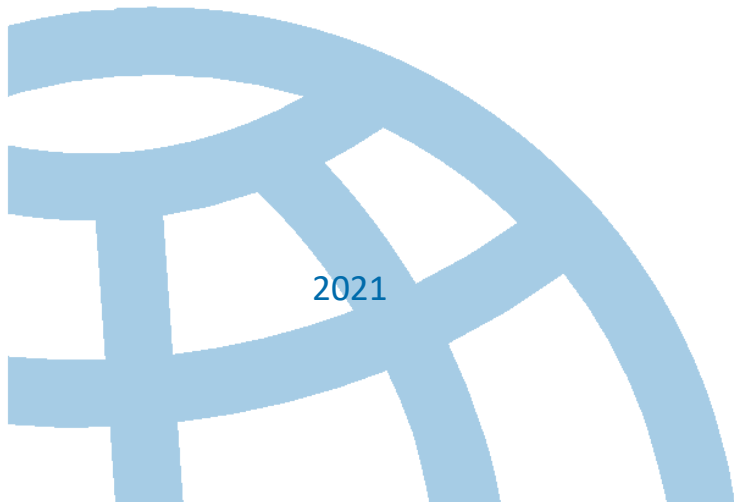


**International Federation of Consulting Engineers**  
The Global Voice of Consulting Engineers

# FIDIC Future leaders .. leading the way

Future leaders booklet – conference publication

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Neelam Parbhoo is a Structural Engineer at Knight Piésold with work experience in the infrastructure and mining sectors. She graduated with a BSc in Civil Engineering from the University of the Witwatersrand in 2016 and a Master of Engineering in 2019. She is actively involved with Consulting Engineers South Africa (CESA) where she serves as Chairperson of the Technology and Innovation Committee as well as Chairperson of the Gauteng South Young Professional Forum (YPF).

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The COVID-19 pandemic has highlighted the need to be adaptable in order to thrive in the face of constant change. In an ever-changing global environment, it is important for engineers to continue to increase their range of skills to remain relevant and progress further.

Whilst the most recognised profile of an engineer focuses on technical and analytical skills, there are several other skills required for effective performance in workplace and project environments. Some of these skills are discussed below:

### **COLLABORATIVE AND INTERDISCIPLINARY APPROACH TO PROBLEM SOLVING**

Collaboration is essential in any team-based work environment. Therefore, it is important for engineers to have the ability to communicate and collaborate across disciplines, in addition to gaining technical knowledge within their field of expertise. This is increasingly true in modern society, where engineers are tasked with addressing complex challenges, which are often less defined and require thinking beyond the traditional engineer's tasks and responsibilities. Solving these problems can only be successfully done through collaboration, and an interdisciplinary approach to problem solving whereby, engineers are able to evaluate, synthesize and apply knowledge from both technical and non-technical fields.

Whilst most engineers are involved in projects where multiple disciplines contribute to a problem solution, modern engineers are required to understand how to integrate and apply knowledge from various disciplines to solve complex problems. In addition, it is important for engineers to understand that fields outside engineering also play an important role in problem-solving process and are required to make connections to knowledge and skills from fields other than engineering.

The development issues we face as society require engineers that are socially connected and able to work both within and outside the boundaries of his or her own discipline, working towards integrating environmental, social, and economical objectives in their work.<sup>1</sup>

### **HIGH EMOTIONAL INTELLIGENCE**

Emotional intelligence can broadly be defined as the "ability to recognize and understand emotions in yourself and others, and your ability to use this awareness to manage your behaviour and relationships." It is made up of four core skills, namely, self-awareness, self-management, social awareness, and relationship management, which relate to personal competence and social competence respectively.

Engineering is often labelled as an unemotional field centred around the cognitive brain, with less focus placed on emotional intelligence. In the past, opportunities allowed for engineers to work well alone, as individual contributors. However, the profession has since changed. Today engineers are required to work in multidisciplinary teams, interact with clients, and are often required to convince others of their ideas and solutions – the modern engineer must interact.

Whilst technical skills and IQ are important prerequisites for success and imperative to secure employment, studies have repeatedly found that emotional intelligence is one of the most important indicators of career success, particularly for those in more senior roles. Skills such as interpersonal skills, teamwork and a strong sense of motivation are essential to succeed.

Oke, et. al. found that emotionally intelligent organisations in the construction industry experience organisational success in terms of improved communication, an improvement in the leadership skills of the professional team, improved productivity, and an improvement in project stakeholder relationships.<sup>3</sup> Having high emotional intelligence ultimately assists engineers to better manage projects and remain aware of the needs and problems of other team members, in turn creating a more efficient workplace. It also allows engineers to gain a better understanding of the end user and their needs, which results in engineers producing design solutions that are not only fit for purpose, but relevant to the end user. This is particularly important in the context of delivering infrastructure in a country such as South Africa, where complex development issues exist.

## **INNOVATIVE AND TECH KNOW HOW**

The Fourth Industrial Revolution (4IR) is upon us, bringing an exponential technological progression disrupting every known industry and profession, including engineering. In the civil engineering sector, we've seen the use of drones, virtual and augmented realities, advanced building materials and design driven by big data. The use of technology in the delivery of a project has been shown to have the potential to make daily operations more efficient, decrease project costs and encourage innovation. It is thus important for engineers to be innovative and leverage the opportunities that technology brings, to remain relevant in the highly competitive environment that we practice.

According to the World Economic Forum, the top three most critical areas of business transformation in civil engineering with regard to the Fourth Industrial Revolution are: attracting new talent and upskilling of professionals with the required skills, promoting integration and collaboration across the value chain and adopting advanced technologies on a large scale.<sup>4</sup>

Whilst the fundamental skills and core principles of engineering will still apply, the future of engineering will be a mix of traditional skills and emerging technology. Therefore, engineers need to upskill their digital knowledge on an ongoing basis and learn to adapt and integrate digital interfaces within their day-to-day work.<sup>5</sup> By integrating the use of technology within the existing engineering project cycle, engineers have the opportunity to enhance the performance of individuals in the workplace rather than replacing them.

As engineers it is imperative to continuously assess if we have the skills and innovative ideas needed to play a meaningful role in the Fourth Industrial Revolution, and to developing a culture of innovation that embraces disruptive technologies.

<sup>1</sup> Van den Beemt, A, MacLeod, M, Van der Veen, J, et al. Interdisciplinary engineering education: A review of vision, teaching, and support. J Eng Educ. 2020; 109: 508– 555. <https://doi.org/10.1002/jee.20347> link to source

<sup>2</sup> TalentSmartEQ, Emotional Intelligence in Engineering, Date accessed: 28 July 2021.

<sup>3</sup> Oke, Ayodeji. (2017). Benefits of emotional intelligence to construction industry: A case of Gauteng region, South Africa. <https://www.researchgate.net/publication/299566618> link to source

<sup>4</sup> World Economic Forum, The Fourth Industrial Revolution is about to hit the construction industry. Here's how it can thrive, Date accessed: 20 July 2021

<sup>5</sup> A. Panos, What skills will civil engineers need in the future? Date accessed: 20 July 2021



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