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

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State of the World

Digital disruption and the evolution of the infrastructure sector

The only certainty in life is change

/A FIDIC report

/Executive summary and recommendations

/SOW 2022

Technology continues to evolve at an unprecedented pace. Whilst most believe this is a new phenomenon, the pace of technological change and the need for business to invest and maintain a relevant skills base have always been essential.

To demonstrate this point, let's remind ourselves of what has come to be known as Moore's law, where Gordon E. Moore who postulated that the number of transistors in a given space doubles about every two years. This statement held true until recently where it is believed physical limits have been reached. It does, however, demonstrate that for more than at least 50 years the pace of technology has continued rapidly.

But technology in the digital age is not all hardware. Software is also as vital to phones, tablets, PCs and business process probably more than ever and given the increasing speed of data transmission the reaction time companies and individuals have to respond continues to be squeezed.

This is not, however, the whole story as whilst technology provides multiple opportunities for more efficient working, communication monitoring etc, it also poses several challenges.

As we have seen in recent times with the introduction of GDPR requirements, users are increasingly becoming aware of the data that is being stored on their activity. Authorities are also improving the rights of individuals to access, monitor and if need be, delete such data held on them if so requested. This therefore requires new levels of compliance, governance and risk assessment for companies.

Such data is also valuable, and cybercrime is a direct result of this. Companies are increasingly aware of attempts to try and harvest or illegally access their systems. Such systems therefore now need to be more resilient and secure than ever, whilst also increasingly being integrated and able to share data with other systems both internally and externally. This challenge is not going to subside with the pace of technological change.

This report explores the pace of this technological change and shows that not only is the pace of change significant, but that many of the technology companies we use today for day-to-day activities in the grand scheme of time are actually very young and company longevity is continuing to decline. This suggests that not only is the pace of change faster but the companies and people we deal with today may not be the ones we are dealing with in ten years' time.

Whilst perhaps aiding innovation, the above does provide some challenges when you consider the delivery of items such as the SDGs and net zero where a consistent and high degree of cooperation and innovation will be required. It also, as this report will discusses, creates an environment that is ideal for a disruptor to enter the sector which could change the business model for the consultancy and engineering sector significantly.

It should be stressed, however, that technology and data may not only provide a catalyst for a disruptor but also act as an encouragement for the sector to innovate.

Broadly speaking, the infrastructure, built and natural environment sector at the highest level is facing three outcomes that could take place:

1. The sector embraces data and technology within existing firms but also allows innovation from new entrants where innovative ideas and services improve customer/client outcomes.

2. We continue with the more traditional approach of proprietary data and, whilst there are learnings, the sector is not taking advantage of the sum of its expertise and data and technology.

3. A disruptor enters the market due to insufficient innovation and adaption of technology and potentially reduces the role of engineers within the delivery of infrastructure using its data/technology assets.

It is therefore important going forward that the sector considers how it wishes to engage in technological change. Broadly speaking, this report discusses three potential approaches:

1. The sector engages with technological change in a similar way to its current situation, where data requirements and technology remain part of a process, but significant shifts are limited.

2. The sector plays a more adaptive approach to technology which is more proactive and will inevitably involve the use of greater data and technology. This could help to drive the sustainability agenda for example by embedding it at the core of all projects and not just as an add-on.

3. The final option is that the sector is progressive. In this respect we consider the sector to be an innovator recognising the significant role of technology and the potential of a disruptor and so going above and beyond to ensure the sector not only plays its role in a data- and technology-driven infrastructure future, but that we are the core driver and innovator of such change.

The above means that companies will also need to consider how they build the above into their own working practices and where they sit on the spectrum between being adaptive and progressive. Below we outline three potential versions of what this could mean for a company.

What kind of organisation are you going to be?

Full data structured organisation – organisations in this position will integrate data, machine learning and importantly the outcomes from data transformation into their activities. You are likely to increasingly resemble a data company than a consultancy company as the data provision between sectors, corporate entities etc, expands

Aiming to be a data structured organisation – these organisations will have gone through the process of understanding what they have and where they need to be. This transition may take time and may involve growing, being acquired or even acquiring the relevant skills, data management techniques or even data access to ensure they can compete going forward.

Extinct structured organisation – these organisations fail to recognise change and the increasing importance of data in day-to-day operations, potentially leading to their cost base being too high and ultimately their business model failing.

> **Recommendation 1** – Using FIDICs newly established Global Leadership Forum and working with global leader's research should be commissioned on providing a wider and more strategic view of what the sector will look like in five, ten- and 20-years' time. This work should include and consider the technology and data discussions and findings in this report.

Communication and technology

Communication, is it as simple as sending a letter or an email? Not quite. In an increasingly connected and digital age, communication channels and the opportunities and risks that exist are not only in flux but changing faster than ever.

Many individuals are on the internet nowadays. They access the web through their PCs, laptops, tablets and mobile devices. Individuals have a Facebook page, Twitter accounts, LinkedIn and some even have a website and so are no longer communicating via one channel. There are over three billion people on the internet today. As an organisation, it's important to remain current on technology or face being obsolete. Keeping ahead of technology is a necessity if your organisation wishes to achieve long-term stability and growth.

To have access to technology we need to have access to information, to be able to find it as fast as possible, to communicate between each other and exchange information. All types of organisations must introduce digital workplace strategies capable of improving collaboration and communication and enabling personnel to work together effectively, regardless of location or device. Communications are enabling:

- Closer to real-time information being shared in crisis.

- Staff communicating on channels that are outside the traditional 'company technology environment'.

- Reputation reward and risks on such channels are very real.

As such, companies are increasingly finding that simply choosing not to engage is no longer an option and in fact strategies need to be put in place to proactively engage to ensure such risks and rewards are managed.

Recommendation 2 – FIDIC should develop a template to aid its member associations (MAs) and engineering firms to put in place structures which help them manage their social media and communications. Providing templates for both internal and external strategies.

This report has shown that the challenges and opportunities from changes in technological solutions and data are not only here now but will continue to be around going forward and that the pace of change and even the players in the market could change significantly.

Recommendation 3 – FIDIC should establish a long-term Digital Committee to monitor and aid the sector in meeting the challenges of meeting the SDGs and net zero in the light of the technological and data changes that will need to be embraced and progressively and proactively embedded into everyday operations and designs.

Finally, this report has noted the speed of change and with the formation of FIDICs Digital Transformation Committee it is important that FIDIC itself looks at how technology will change its own business model and contracts.

Recommendation 4 – the new Digital Transformation Committee should create a task group to deliver a digital version for all FIDIC contracts by working with industry partners and education establishments.