Insight into the millennial mind-set: Impact of 4IR and Society 5.0 on the real estate, construction and other industries

L L Cook
Lecturer: Department of Construction Economics, University of Pretoria, South Africa
E-mail: Laetitia.cook@up.ac.za

Abstract. The exponential adaption rate of new 4IR technology brings about challenges generally experienced as complex and even threatening by real estate and construction industry practitioners. Now faced with Society 5.0 in which people’s lives are made more comfortable and sustainable by continuously creating new tech driven services and value adds, seasoned practitioners may feel overwhelmed as fringe disciplines encroach on their domain with tech savvy “smart” solutions. The millennial mind-set of practicality, optimism, and confidence could aid our industries in addressing the burning issues we presently face with an underperforming sector due to general economic downturn, further fuelled by COVID-19.

Keywords: Millennials, millennial mindset, construction industry, Society 5.0, 4IR, nanotechnology, real estate, disruptive.

1. Background
As the millennials’ saying goes: “If you’ve got a wicket problem, you’ve got to hack it”. The word hacking in this context does not refer to “crackers”. A hacker is:

“A person who delights in having an intimate understanding of the internal workings of a system and computer networks in particular. The term is often misused in a pejorative context, where ‘cracker’ would be the correct term” [1 p. 1].

The hacker’s intent is not malicious, as that of the cracker, but rather to resolve complex (or wicked) problems by thinking out of the proverbial box. Millennials are more comfortable in this space than their baby boomer or GenX predecessors who, when faced with urgent serious challenges, would generally hold strategic planning sessions in boardrooms with committees while millennials conduct hackathons in collaborative working spaces like WeWork. These hackathon events comprise a diverse group brought together on an ad hoc basis in order to prototype solutions, usually technologically based, in order to resolve complex social conditions [2]. The focus is on implementation rather than over analysing and prolonged planning.

The mind-set of millennials could aid our industries in general to address the burning issues we presently face. The real estate and construction sector serve as a perfect example. Challenges are brought about by new technology in the fourth industrial revolution (4IR) with countless devices acting on, and sharing data via the Internet of Things (IoT) through seamlessly integrated connectivity (like 5G). Interacting with, and relating to artificial intelligence (AI), blockchain, robotics, etc. are generally complex endeavours and often perceived as rather threatening to prior generations (excluding the scientists who created them).

2. Method
After more than 20 years of working with millennials in several industries, most notably construction and real estate (while working with and for some of the foremost property developers in South Africa), coupled to the privilege of lecturing Psychology at first and later Construction Economics, a lot of
experience was gathered in dealing with the millennials as well as the previous two generations. The study is thus qualitative in nature and includes a review of recent literature. The aim is to shed more light on the generational approaches as summarised for Baby Boomers (born 1946-1964), Gen X (born 1961-1981) and Gen Y (born 1980-1994) in experiencing and managing the era of connectedness with associated technological advances as well as its impact on our disciplines. Gen Z (born 1995-2015) was omitted as they are only starting to enter the job market now.

3. Literature review
The captains of industry in the construction and real estate environment who hail from the generations (prior to millennials) are now accosted by the above-mentioned new technologies and much more. The impact of nanotechnology or “nanotech” on building material is a particular example. The official website of the United States National Nanotechnology Initiative illustrates the miniscule size of these materials on the Nano scale (a nanometre is one billionth of a meter, thus $10^{-9}$) by providing the example of a sheet of newspaper that is approximately 100,000 nanometers thick. “Today's scientists and engineers are finding a wide variety of ways to deliberately make materials at the nanoscale to take advantage of their enhanced properties such as higher strength, lighter weight, increased control of light spectrum, and greater chemical reactivity than their larger-scale counterparts” [3].

Various nanoparticles and nanostructures are now being used to improve traditional construction materials. Graphene, for example, is a flat one-atom thick sheet of carbon, also called a two-dimensional material with advantages including significant weight reduction, strength and durability far exceeding the current norm. The material is 10 times as strong as mild steel, yet it has a density only 4.6% that of mild steel [4]. It is already being produced commercially and sold by companies like Graphene Star Ltd. for purposes such as additives to: adhesives (to metal, wood, plastic and glass, increasing the strength of the adhesive joint to in excess of 180%), batteries (to increases the number of charging cycles and reduce charge time), composites (to epoxy or polyester resin in order to increase the strength of the composite by 130% and to improve antistatic properties), paints and varnishes (to produce antistatic and conductive effects, improve water-repellence and durability as well as make polyurethane and epoxy coatings anti-corrosive), and concrete additives. “During the formation and curing of cement, these tiny micro-platelets are able to take up space previously filled by air. Less air means higher density and higher density is directly related to performance improvements in flexural strength, abrasion resistance, impact strength and toughness” [5].

Other properties of nanomaterials include self-cleaning and scratchproof abilities (for photovoltaic panels, and when the technology becomes less costly, may be used for glass façades and shopfronts), flexible and energy reducing surfaces, and antibacterial properties. Sharklet, another commercial producer of nanotech products for the built environment was recently featured on TEDx [6]. Business Development Vice President, Dr Ethan Mann explained how antibacterial properties of the nanostructure of the surface of their material prevents bacteria, including antimicrobial resistant bacteria from attaching to it. Sharklet now produces a film that can be applied to multi-touch surfaces in hospitals, escalator and other hand rails, offices, and hotels to reduce transference of germs. The importance of such preventative measures became apparent during the present COVID-19 pandemic.

Along with 4IR comes Society 5.0 in which people’s lives are made more comfortable and sustainable by continuously creating new value adds and services in age old industries [7]. In his book “Society 5.0: We and I" Dr Miguel Goede describes the emergence of the new era of connectedness as well as the difference between the previous era’s mindset of “I” and the new developing mindset of “we” that characterises Society 5.0. Describing “we” and “I” as mindsets he states that:
“We” cares and “I” does not. “We” gives but “I” takes. “We” is abundance. “I” is scarcity. “We” pays taxes and “I” tries to evade taxes. “We” loves, and “I” loves only himself. “We” is open and “I” is closed. “We” are family. “I” is alone. “We” is sustainable and “I” is not.

He describes the present as a time of volatility, complexity, uncertainty, and ambiguity, a time of global crises including an economic or financial crisis, a climate crisis accompanied by plastic soup in the ocean and large-scale extinction of species, social inequality and the associated polarization of societies fuelled by social media and fake news, food scarcity, and the looming disappearance of jobs due to AIs robotics, blockchain, etc. A rather dire outlook at best. Yet the mindset of Society 5.0 might provide for a less pessimistic outcome. This view is shared by other social scientists and holds that the online society brings about an era of growing complexity of the social system, extension of networks, increased digitisation but also increased connectedness. These features of Society 5.0 demonstrate the onset of the era of digital society.

The exponential rate at which new technology is adopted by society is illustrated by the Citi GPS reports co-produced by Citi and the Oxford Martin School at the University of Oxford “in order to explore some of the most pressing global challenges of the 21st century” [10]. As can be seen from Figure 1 below, re-created from the Oxford report and updated with later information, the rate is indeed exponential. Pokémon GO was released in 2016 and reached 50 million users 1,610 times faster than it took the telephone to reach the same number of users. Now fifth generation connectivity (5G) has materialised (Figure 2 below) with a more obvious exponential impact on the speed at which new technologies reach industries.

The rate of change is disruptive as it rapidly alters most industries, challenges the status quo and leaves behind old methods and those still firmly attached thereto [11]. The built environment and real estate are no exception together with their related disciplines such as property development, finance, management, and investment.

Customers, tenants, landlords, retailers, construction companies, property developers, project- and development managers, valuers, conveyancers, land- and quantity surveyors, engineers, architects, investors, fund managers, etc. are all affected. Once the paradigm shifts, past success is no indication of future success (as illustrated by the impact of COVID-19 lockdown on the industry). Young tech-
savvy millennials from fringe industries are encroaching on the traditional domain of our industry. Mobile is the new norm and already in 2018, consumers had downloaded no less than 194 billion mobile apps to their connected devices [12]. This amounts to more than 25 apps per person, had everyone on earth participated, illustrating not only the rapid shift to mobile but also the rate at which new technology in general, and apps in particular are being adapted.

Since many apps are mere gimmicks or gadgets, it might be argued that apps are not technological advancement but only the application of prior technological advances on a mobile platform. While this view has merit, after all it was the Baby Boomers that created the microcomputer and wireless communication, and Gen X who advanced the microchip to materials and components on the Nano level, which facilitated the Millennials’ ability to use these technologies. This view is not entirely correct as app development does also motivate new technology, in smartphones for example.

Let us consider the success of medical / health care environment apps like Hospital Fit that combines post-operative patient instructions with actual objective measurement of their activity via in-app communication of the accelerometer’s data with the doctor and the patient. These days most smartphones contain accelerometers [13]. The odds of achieving functional recovery in orthopaedic surgery patients using the Hospital Fit app was found to be 3.02 times higher than those using the traditional methods [14]. The same holds true for an app developed to assist with the rehabilitation of lung surgery patients to prevent post-operative complications [15]. Many other apps make use of wireless monitoring sensors in smartphones and wearable tech such as gyroscopes, accelerometers and pedometers to, for instance monitor and present real time feedback on blood pressure, glucose levels, fall detection, and the measurement of medication management, mental health, and health care in general.

At the 2019 International Conference on Smart Infrastructure and Construction (ICSIC) it was stated that the IoT and the use of mobile applications for purposes of “…sharing of knowledge has become commonplace, especially among generation Y [millennials]. Nonetheless, the construction industry has not fully adopted these tools in knowledge sharing” [16].

Bersin, Deloitte Consulting LLP recently publish a report on the future of talent in the world of work that applies to real estate and construction industry professionals as much as any other industry. The report presents a list of key disruptors that bring about “Unprecedented Change” but also huge opportunity [17]. Amongst others they list:

- Technology is everywhere with 2.6 billion+ smartphones in the world (that was in 2018);
- A “Tsunami of data” as the major enabler of machine learning;
- Jobs vulnerable to automation: 35% in the UK, 47% in the US and 77% in China;
- Diversity and generational change: Millennials comprise 50% of the world’s population, thus millennials will have a “Longevity Dividend” with 50-year career span ahead.

As all generations in the developed world tend to live longer and mostly healthier lives due to advances in medical sciences, they also work longer (retire later). Millennials, now on average in their early 30s will be actively working for at least 40 if not 50 years to come.

Millennials are indeed the largest generation yet on earth but also the most educated [18] and they differ significantly from previous generations. Referred to as the “Me, me, me” generation, millennials are often regarded as entitled, self-centred, and even lazy. They spend too much time online and apparently appear narcissistic. But why do older generations often perceive millennials in this manner, and what contributed to these generalised perceptions?
Several insights from direct experience combined with literature led to the development of a model or mental framework that might benefit other academics and practitioners. Firstly, the point of departure (Figure 3) and secondly, the future perception of these generations differs fundamentally (Figure 4). The Baby Boomers and Gen X, parents were born into a world of scarcity, often struggling to make ends meet. A single car per household was not uncommon, siblings having to share a room, limited choices when it came to accommodation type, retail, consumables, and a set of encyclopaedias as a desired luxury, are some examples. Yet a huge world of opportunity awaited and a good career was almost guaranteed up to retirement, by studying hard, saving up, and postponing gratification by sacrificing what one loved.

To what extent, might ask the millennials? The heart attack that came before retirement, early retrenchment due to economic, social, technological, and/or political changes (even a pandemic), their golden years spent far away from loved ones on other continents? The real world was a rude awakening to many. But so too for the young millennials, mollycoddled into believing that anything is possible, that they will all be successful, all obtain rewards and be recognised, even for simply participating. The dopamine addiction to likes on Facebook, role models like the Kardashians, online and virtual relationships as well as a fear of missing out stems in part from being born into the exact opposite circumstances or era than the previous generations. A world of abundance with unlimited access to information, vast arrays of consumables, with Google in their pockets. And yet a future of scarcity awaits them.

Huge unemployment rates as reported “in the second quarter of 2020, COVID-19 may cost the equivalent of 305 million full-time jobs” [19], disillusioned with leaders and politicians, an inheritance of economic and social problems, environmental disasters, global recession, refugee crises, etc. bears testimony to the legacy of their well-meaning, hardworking, and self-sacrificing parents.

It is therefore not surprising that millennials, generally speaking, focus on being happy, creating ideas, solving problems (even wicked ones), living - not only working and studying-, and doing what
they love. The World Happiness Report (2020) agrees and ranks a sense of community and how people interact with each other above per capita GDP [20]. And yet when it comes to investment, millennials are surprisingly more similar to the Depression generation (whom they never knew) than to their parents.

Beth Kobliner, who acted on the US President’s Advisory Council was interviewed by Forbes Magazine [21] and has faith in millennials when it comes to our future. She explains that the Great Depression and the Great Recession generations lived 87 years apart yet they both endured major economic upheavals that were not of their own making, and they survived. “Many millennials have seen what happened to parents; they’ve seen what can happen with adjustable mortgages when you can’t make the spiralling monthly payments…” and yet she calls them “The Greatest Generation” and perhaps so doing, provides us with much needed hope for our longer-term future, largely in their hands.

4. Conclusion
Millennials are optimistic, confident, and pragmatic even in the challenging times we live in. These are not bad qualities at all given that “… a generation's greatness is determined by how they react to the challenges that befall them. And, just as important, by how we react to them” [18]. Let us attempt to learn from these brave young minds and start hacking the wicked problems our industry face, rather than expecting them to simply follow and learn from us.

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