

Managerial Imperatives in Merging the Physical, Digital and Biological Worlds

04 March 2022



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Businesses today face an increasingly unpredictable environment with an unprecedented rate of change. Over the past decade awareness has grown of a transformational technological and social change, largely driven by the fourth industrial revolution, a phenomenon coined by [Schwab](#) in 2016. The fourth industrial revolution, which is also known as 4 IR or Industrial 4.0 is the era of intelligent systems intrinsically driven by the merging of [three types of technologies](#), namely physical (autonomous vehicles; advanced robotics; 3D printing), digital (IoT; blockchain) and biological (synthetic biology). In this short article, we explore the new mindset managers need to adopt as leaders to create a successful strategic orientation and organisational culture in the merged physical, digital and biological worlds.

Technology as a cornerstone for competitiveness

The development in many industries reinforces that existing business models need to be reconsidered with technology as a cornerstone for future competitiveness. Disruptive technologies have made consumers' entry into the [digital world](#) easy and affordable for example with ride share applications and live streaming of movies. Similarly, in the banking and finance sector, the advent of innovative financial technology (fintech) companies is evidence of the digital disruption which larger banks need to compete against. While in the retail industry, the [rules have been rewritten](#) with bricks and mortar businesses needing to embrace digitally immersive experiences and social commerce to survive. The digitally interactive virtual world or 'Metaverse' offers opportunities for companies with vision and the requisite skill sets. The global market of the metaverse at US\$107.1 billion in 2020 is anticipated to grow to US\$758.6 billion by 2026.

Companies need to re-evaluate their core competencies to compete in a digitally networked environment. These technologies have already improved efficiency and productivity in the manufacturing and service sectors. Essentially, the future of manufacturing is the increasing integration of information technology and operations technology. Companies with a customer-centric strategy based on the digital transformation of manufacturing will be able to offer more personalisation and customisation. Businesses can increase the value of physical products and services with [digital capabilities](#) and [power customer experiences](#).

The global pandemic that emerged in early 2020 saw the industrial internet permeate into the fabric of work and life. The technologies of 4 IR facilitated the ability to work flexibly during the pandemic and allowed companies to utilise their people as a key resource to remain competitive. Clearly, the opportunities offered by 4 IR to enhance competitiveness are across a wide spectrum from enhanced productivity to customer connectivity to working flexibly. However to realise these opportunities, organisations need to overcome challenges including [cyber security](#), [governance](#) and the [availability of skill sets](#) such as technological and digital literacy.

New strategic orientation and organisational culture

There is a need to envision the automated and digitised future and develop a new strategic focus to transition into this changing world. The World Economic Forum's report "[Unlocking Business Model Innovation through Advanced Manufacturing](#)" suggests companies go through a three-stage process to achieve the goals of transitioning towards digitisation and automation of their processes.

Organisations need to first identify the areas that lack the digitisation and the skills required by their employees. In the second stage, they need to invest into the infrastructure and technical skills required to achieve the strategic goals of automation and digitisation. This may require collaboration with some external stakeholders keen to invest in the future. Finally, in the last stage they need to develop long term scalable digital solutions.

An organisation's culture should be supportive of this transformation into the next industrial revolution. A discussion by [McKinsey & Company](#) about empowering people suggests that initially employees might fear that automation and robotics would lead to job loss. Leaders need to promote an organisational culture where people do not look at technology as a threat but as an opportunity to educate and advance themselves. The preparedness for 4 IR is not just about infrastructure readiness but also workforce readiness equipped with [futuristic skills](#).

A [white paper](#) published by the World Economic Forum in partnership with Saudi Aramco, Unilever, and Willis Towers Watson identified six strategies that could be incorporated by business leaders to successfully meet the future human resources challenges. These include 1) Developing new leadership capabilities for the 4IR; 2) Managing the integration of technology in the workplace; 3) Enhancing the employee experience; 4) Building an agile and personalized learning culture; 5) Establishing metrics for valuing human capital, and 6) Embedding inclusion and diversity. These strategies would add value to the role of HR and Leadership practices for defining and reshaping the work practices and how businesses could support the new framework to achieve effectiveness. Leaders need more preparation in [implementing](#) Industry 4.0 technologies.

[Harvard Business Review](#) mentions four types of leaders as better equipped in responding to the challenges of the next industrial revolution, namely 1) **social supers** who make sure that products and services are socially and environmentally conscious; 2) **data-driven decisive** use insights drawn from data to lead organisations and capitalise on new opportunities. 3) **disruption drivers** who invest in technologies to upend the market and competitors and take a holistic approach to decision making; and 4) **talent champions** who are apart from the rest in preparing and training their workforce for the future of work. It indicates, leaders with the characteristics listed above are not only improving their business growth but are visionary in the way they manage their businesses in the future.

Conclusion

With technology as a cornerstone of competitiveness, companies with a long-term strategy to invest in digital and technology and requisite skills will survive. The managerial mindset needed in the fourth industrial revolution is to embrace change and lead an organisational culture of lifelong learning. As stated by [Jeff Gravenhorst](#) the former CEO of International Service System (ISS):

"Many of today's leaders were brought up on the old systems and the mindset that things will last. The rate of change and amount of data today can be overwhelming in comparison. In this environment, leaders today must lead with courage, let their old ways go, allow younger generations to step up, and get comfortable with change"

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