**[Tech’s promise & peril](https://www.dawn.com/news/1830276/techs-promise-peril)**

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THE best of times and arguably the worst of times. This is how an important new book sees what advanced artificial intelligence and biotechnology can mean for the future of humanity. *The Coming Wave* joins a growing body of literature on one of the defining dynamics of the 21st century — the transformative impact of new technology. Its author Mustafa Suleyman, is uniquely qualified to assess both the opportunities for human advancement offered by new technologies and challenges, which can result in dystopian outcomes. He is the co-founder of two AI companies, which did innovative work in this field. Therefore, his perspectives are those of a tech insider.

His book takes forward the global discourse on the promise and perils of new technology. An illuminating work co-authored by Henry Kissinger, Eric Schmidt and Daniel Huttenlocher, *The Age of AI: and our Human Future*, published in 2021, also made a significant contribution to this debate. In fact, AI breakthroughs are now outpacing understanding of their full implications at a time when predictions abound that AI capabilities will exceed those of humans within a few years.

Modern technology has powered multiple positive developments — empowering people, improving lives, increasing productivity, advancing medical and scientific knowledge and transforming societies. Technological developments have helped to fuel unprecedented social and economic progress. But advanced technologies are also creating disruption, new vulnerabilities and harmful repercussions, which have yet to be mitigated or effectively managed.

Suleyman shows how the coming wave of technology will take human history to a turning point. The two core technologies that constitute the coming wave — AI and biotechnology — will bring about unprecedented progress and wealth. But their proliferation will also unleash many adverse effects, even “catastrophe on an unimaginable scale”. He calls this the “great meta-problem of the 21st century”, which his thought-provoking book examines by focusing on the bind that exists between risks and rewards and how to deal with it. Suleyman’s principal concern is how to “constrain” technology so that it serves and does not hurt humanity. He discusses what he calls the “containment problem”, the task of ensuring control of valuable technology as it gets cheaper, more accessible and spreads faster than ever before.

Can the harmful aspects of new technology be contained?

For Suleyman, human history can be told through a series of waves. Explaining what he means by a wave he says it is “a set of technologies coming together around the same time powered by one or several new general-purpose technologies with profound societal implications”. He incisively recounts the history of technology and how it spreads with both intended and unintended consequences, giving rise to the containment challenge.

He describes technology’s inevitable challenge to be its makers losing control over the trajectory their inventions take once they are readily available. The uses to which these inventions are put are not in anyone’s control. They are unpredictable and also difficult to forestall. This, in turn, produces what Suleyman terms “revenge effects”, which means technology going in the wrong direction at odds with its original purpose. Technology always creates problems that makes containment necessary to check its harmful effects on society. Yet the containment problem remains unresolved. But according to Suleyman, there is an exception — nuclear technology, the most “contained technology in history”. Its spread has been curbed by the non-proliferation policy of nuclear powers driven by fears about their devastating effects. Also, nuclear weapons are immensely complex and costly to develop.

The book’s survey of AI’s evolution, punctuated by his own company’s discoveries, makes compelling reading. The author casts the advent of AI and synthetic biology to be an inflection point as these technologies address the world’s two foundational principles, intelligence and life. They are opening up unprecedentedly new areas, engineering life and competing with and even threatening to overtake human intelligence. This technological wave, with AI as its pivot, will be tougher to contain. But understanding it, writes Suleyman, will be the key to accurately assess its many ramifications, especially as mass-scale AI is now advancing by leaps and bounds. The book details progress in biotechnology and genetic engineering, which is also taking place at extraordinary speed and ushering in the “age of synthetic life”. But other transformative technologies, such as robotics and quantum computing, are also part of the new wave.

Suleyman seeks to convincingly demonstrate why the coming wave has no historical precedent and is so consequential. This urges the need to strike a balance between its promise and hard-headed caution. He identifies four features integral to the coming wave — the technologies are multi-use, they “hyper-evolve”, have “asymmetric impacts” and are increasingly autonomous.

In an insightful discussion of the ‘Grand Bargain’ between citizens and the state, he sets out the threats posed by new technologies to this delicate equilibrium. This, he posits, is “fracturing the grand bargain”. It is putting the political order under great strain and undermining already fragile and increasingly divided nation-states especially in the West, where trust has been declining. This makes it harder for them to manage modern technology, which in turn weakens their power and governing capacity. Meanwhile, tech-empowered “bad actors” erode the state’s ability to provide security to its citizens. Deepfakes and weaponisation of information pose another threat.

Given these and many other dangers, as well as the disastrous consequences the next wave of technology can entail, Suleyman gets to the book’s core argument: how to make containment possible without foregoing its enormous benefits. Regula­tion is not enough. He sees containment as a set of interlocking technical, cultural, legal, political and governance mechanisms to ensure societal control of technology. And he proposes both the public and private sector should partner in this endeavour.

Ten steps are outlined towards containment. They include building technical safety, audits for accountability, reconciling profit with social purpose, assigning a proactive role to government in monitoring technology and, at the in­­ternational level, collaboration to harmonise laws and programmes. Containment, the book con­­cludes, is not “a resting place” but “a narrow and never-ending path”. Whether such an ambitious menu of measures can be put into practice is an open question. But there can be no disagreem­ent with Suleyman’s bold call for urgent action to constrain the harmful aspects of new technology.

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