

## Post COVID-19 Industrial Revolution 5.0. The dawn of Cobot, Chipbot and Curbot

### Perspective

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Coronavirus disease 2019 (COVID-19), a severe acute respiratory syndrome (SARS-CoV 2) originated in the Huanan Seafood market in Wuhan, Hubei Province, Central China. It is also known as the novel coronavirus (2019-nCoV).[1] The spread of this epidemic likely originated from bats and pangolin and then infected humans via intermediate hosts such as cats, buffalos, cattle, goats, sheep, and pigeons.[2-4] The Wildlife Conservation Society documented the transmission of COVID-19 from human beings to a four-year-old tiger named Nadia in New York city.[5] COVID-19 cuts through income barriers and has hit the unlikely places and individuals. The wife of Canada's prime minister has tested positive for the virus.[6] The Italian chief of army staff has tested positive.[7] An adviser to Iran's supreme leader has died of COVID-19.[8] German Chancellor Angela Merkel has given a stark warning that up to 70 percent of the country's population could contract the coronavirus.[9] Stock markets around the world have since seen an unprecedented meltdown.[10] The famous philanthropist Bill Gates believes that "no one who lives through pandemic will ever forget it and its impossible to overstate the pain that people are feeling now and will continue to feel for years to come".[11] Until it's mitigation, it is a time bomb.[12] Hence, like a bomb, this viral bomb can change the landscape of the current world. It may even lay down the foundation for the Industrial Revolution 5.0 (IR5.0). IR5.0 is the "use of sophisticated machinery to make the work of human beings easier and faster".[13] The first three industrial revolutions began roughly one century after each other. IR 1.0 involved mass-scale mechanization and began in the 1770s.[14] IR 2.0 introduced electrification and began in the 1870s.[15] IR 3.0 spearheaded automation and began in the 1970s.[16] However, IR 4.0, which saw widespread digitization, started in 2001; it was only three decades after IR 3.0 and at the dawn of the third millennium.[17] IR4 is internet technologies and big data.[18] Japanese researchers classify these industrial

advancements in a different way. They start with defining Society 1.0 as the hunter-gatherer stage of human development. This is followed by the second agrarian stage (Society 2.0) and third industrial stages (Society 3.0). We are now moving beyond the fourth information age (Society 4.0).[18] In each of these four phases, dehumanization was the major outcome. In contrast to this trend, personalisation is expected to play a major role in IR 5.0 – perhaps humans and machines will dance together, metaphorically.[19] Whether IR 5.0 has already started or not remains controversial. Economic experts believe that with the advent of crypto currencies IR 5.0 has "already" arrived.[20] Bill Gates believes that after Modern Pandemic I, schools will open but large gatherings like filling a stadium with 70,000 people will not be possible. He posits that people will not be able to spend money like before and half of all employment may be online like in Microsoft China. Social distancing, mask and sanitizers may become norms for the future society.[11] Scholars and futurists have already started the discussion on IR 5.0.[21, 22] The current scope contains two visions for IR 5.0 i.e. human-robot co-working and the bio-economy.[21] The main principle of bio-economy is biologization. This is the use and production of complex biological molecules and systems at an industrial scale.[22] Bio-economy along with space adventures (space life, space industries, and space mining) and the increasing penetration of Artificial Intelligence (AI) into everyday life are considered important elements in the



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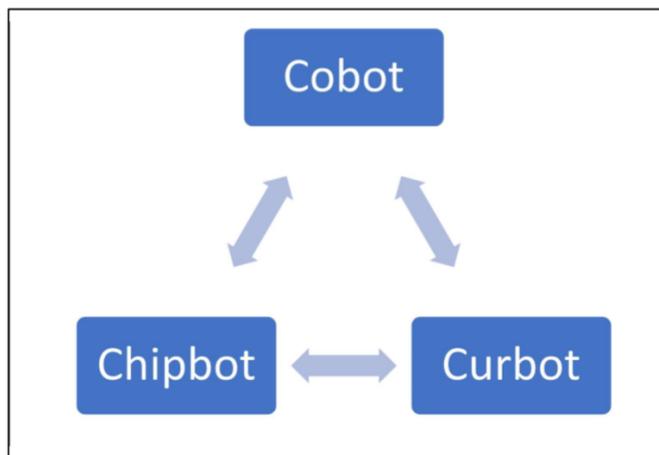


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IR5.0.[23, 24] The Japanese introduced Society 5.0, which is based on a high degree of convergence between cyberspace (virtual space) and the physical space (real space).[25] The internet of things, or IoT is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.[26] Whereas, AI is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. Big data is a field that treats ways to analyse, systematically extract information from, or otherwise deal with data sets that are too large or complex to be dealt with by traditional data-processing application software. Finally, Society 5.0 is the Big Data collection by IoT and its conversion through AI to provide comfort in people's lives.[18, 26] Unlike IR 5.0, the concept of "Society 5.0" (Super Smart Society) is already under discussion.[27] It was conceptualised as a society where advanced IT technologies, IoT, robots, AI, and augmented reality (AR) would be actively used in people's everyday life, in the industry, health care, and other spheres of activity.[18, 28] The emphasis is not progress, but is placed on the ordinary use of technology for the benefit and convenience of the individual.[28] AI, AR, and 3D printing will be used to convert robots into personalized and customized **cobots** (collaborative robots). The bio-economy will be driven towards paperless and bank-less market, preferably termed **curbot** (currency and bank-less systems). Medical microchips have been in use for the purpose of identification, physical access control, contact less retail payment, and even the tracing of kidnapping victims.[29] The authors prefer to label this proposed development as a **chipbot** (a human with implanted chips) and there are additional sources that verify this reported remedy about implanting human being with microchips.[30] The internet of things (IoT) has been around for years. The Internet of Bodies (IoB) is an extension of the IoT. [29, 30] IoB basically connects the human body to a network through devices that are ingested, implanted, or connected to the body in some way.[31, 32] Once connected, data can be exchanged, and the body and devices can be remotely monitored and controlled. Another common name for the IoB is embodied computing, where the human body is used as a technology platform.[32] In fact, the number of human beings with chip implants (chipbots) is progressively increasing along with the worldwide



**Figure 1:** Triad of Chipbot, Curbot & Cobot interactions in post COVID-19 era



# 5.0?

**Figure 2:** Industrial Revolution through ages growth trends in curbots and cobots.

COVID-19 has forced the world into a lock down with minimum scientific evidence.[33] Considering the significant impact of COVID 19 on human life, the authors believe that it can be a trigger factor for IR 5.0 . Future researchers can define IR5.0 properly but just after a lapse of 20 years (after IR4.0), the new Industrial Revolution 5.0 can emerge to change the world.[13, 16, 18, 21]

The Triad of IR 5.0 (consisting of Curbot, Cobot & Chipbot interactions) in a post-COVID era can be responsible for drastic changes in community norms of the world[figure 1]. Research and innovations will open a new era of social distancing (self-isolation, quarantine, lock down, and curfew), personal hygiene, personal protective equipment (PPE), treatment (vaccines, plasma, anti-viral ventilator support, and emergency care), early detection, non-touch techniques (QR-Pay, cryptocurrency, tele-medicine).

IR 4.0 moves towards IR 5.0 when customers have the ability to customize what they want. Simply, it is the cooperation between human beings and machine. IR 5.0 is already showing its emerging trend through the interaction and collaboration between man and machine. [34] 3D printing is being considered as a turning point for

IR. 5.0.[35] With emerging 5G technology, sensors on any device will be able to connect to the internet regardless of Wi-Fi availability – enabling mobile devices 24/7 access to bandwidth. The applications are vast – from smart medical devices, such as pacemakers and insulin pumps that monitor the body and apply the appropriate treatment in real time, to a connected Internet of autonomous vehicles.[36] Industry 4.0 values best quantity and mass production whereas Industry 5.0 values life standard, creativity and high-quality custom-made products.[36] Industry 5.0 will change the definition of the word “robot”. Robots will no longer be just a programmable machine that can perform repetitive tasks but will transform into an ideal human companion for some scenarios (e.g. spies or bodyguards). Providing robotic productions with the human touch, the next IR will introduce the next generation of robot (cobots) that will already know, or quickly learn, what to do as boss, subordinate, colleagues or security guards. These collaborative robots will be aware of the human presence and will therefore be able to take care of safety and risk criteria. Industry 5.0 will bring unprecedented challenges in the field of Human–Machine Interaction (HMI) as it will put machines very close to the everyday life of a person.[36] The authors believe that when robot will be replaced by cobots and by augmented AI, human minds will be controlled by super-minds (preferably super masters) through nanotechnology used to convert human beings into homebots/chipbots. This synergism of cobot, chipbot, and curbot will result in the real IR. 5.0[figure 2].

The actualization of IR5.0 will encompass a wide range of domains and applications. The chipbot will be the hypothetical human that will result after COVID-19 through implantable nanotechnology chips. This will be enabled by mass vaccination using assisted hidden technology in vials. The crypto currency robots (curbots) will be technology assisted mobile banking robots that replace or complement the real physical currency or banks. This will lay the foundation of the cashless market. The need to open tele-medicine centres in developing countries after pandemics will be self-explanatory. Terminologies in tele-medicine will change as predicted and virtual specialist hospital based on remote presence will develop more rapidly. They will be a new source of hope for patients and physicians as they will allow adherence to strict social distancing guidelines and access to expert opinions and treatments.[36-38] Tele-cardiology and other highly

specialized applications are already progressing (even in developing countries) and will significantly reduce morbidity and mortality by their introduction in rural settings.[38] The physical interaction between the young and the elderly will be discouraged initially but will later become a societal norm. Drones will be used to link hospitals and hostile humans. Roboscope (non-interventional robots) will be replaced by Roboop (interventional robots).[39] Once human beings have been conquered, the race to conquer space will start. This will initiate the new era of IR6.0 within next ten years. Like the earlier industrial revolutions, IR6.0 will likely neglect human beings and perhaps result in some unrest. Fortunately, there is ample time to ensure that the contributions of IR 5.0 can minimize or subvert the negative externalities of IR6.0.

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