Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Impact on biometrics of Covid-19

Stuart Carlaw, ABI Research

At this time of global concern for the health of our loved ones, communities and workplaces, ABI Research analysts have assessed the likely short and long-term impacts that the global Covid-19 pandemic will have on the biometrics and related technology markets. Beyond the significant cost to human life due to the pandemic, it can be argued that Covid-19 will also have a significant and long-term impact on biometrics companies, developers, investors and customers.

Taking a step back, it is clear that many scientific and technological gains emerged from World War II, and after the numerous stock market crashes in the 1920s, 1980s and 2000s. It’s feasible that the coronavirus disease outbreak and the global reaction to it will bring business change of a similar magnitude.

“Biometric systems are in the spotlight as a key technology for early detection, patient screening and public safety monitoring to contain the spread of Covid-19”

But before we feel this potential long-term impact, there will be some serious short-term implications. Contractions in consumer spending, disruptions to supply chains, and reduced availability of components have created a rough sea for all boats. There will be wrecks and we should be prepared for that. Before any change occurs, there will be a retrenchment in outlooks and a reduced investment in modernisation, as survival instincts trump the drive to prosperity.

But what is also clear is that technologies like biometrics, artificial intelligence and machine learning will play a key role in responding to the pandemic. Several companies, including Alibaba, YITU, Graphen and Google DeepMind, have developed AI tools to help detect the virus, diagnose its evolution, track its geographical footprint, project its future, and predict its potential protein structure to find a vaccine for it.

Big moment for biometrics

In particular, biometric systems have been brought into the spotlight as a key technology for early detection, patient screening and public safety monitoring, in an effort to contain the spread of Covid-19. Surveillance, border control, law enforcement, healthcare and biotechnologies are the key markets that are rapidly introducing biometrics into infectious disease prevention and control protocols. This worldwide effort has been led by China, the centre of the new virus strain(s). And the response has been focused around two key areas, an application-specific and a macro level – with leading AI biometrics companies like SenseTime, Megvii and Baidu adapting machine learning (ML) algorithms to meet the evolving threat.

At the macro level, face recognition and surveillance operations are being retrofitted with new screening software to detect individuals who are not wearing protective masks. In addition, new AI developments are being used to try to counter-balance any identification problems due to partial face concealment, which remains a prevalent challenge for face recognition, thus pushing biometric ML and AI algorithms to the next evolutionary step.

On an application level, fever and temperature detection technologies have become the weapon of choice for biometric screening for public security officers and field agents, across law enforcement, healthcare and transporta-

To counter-balance identification problems due to partial face concealment, biometric ML and AI algorithms are being pushed to the next evolutionary step.

Meanwhile, in the longer term, Covid-19 will have a significant impact on future biometric applications across different markets and verticals worldwide. Contact-only applications are likely to suffer in certain markets, including enterprise, healthcare and border control, and generally any use-case scenario that deals with workforce management and access control.

“Contactless technologies like face and iris recognition are now being pushed to new heights to extend governments’ protective, monitoring and screening reach. In contrast, applications that rely on fingerprint and vein recognition modalities are suffering a significant loss”
Vendors will need to rethink fingerprint and vein verification modalities as governments look to give additional emphasis to face and iris technologies. This will create even more hurdles, because a great many biometric systems used in law enforcement are based on fingerprint identification – including police automated fingerprint identification systems (AFIS), biometric identification systems (BIS), and border control, visa control and immigration apps.

Instead, additional investment is expected to be ploughed into:

- Face recognition, merged with AI and machine vision – to develop systems capable of adapting to users’ various different objectives and screening protocols.

- Iris recognition – developing systems that can bypass the partial concealment limitations due to subjects wearing masks, but also wellness monitoring systems (eg, pupil dilation, blood concentration, etc).

- Alternative new biometric detection technologies, such as temperature and fever detection systems, and systems that can analyse behavioural patterns and emotional/psychological states – for example, to monitor, predict and anticipate any abnormal incident.

In financial terms, the price of contact-only biometric sensors and related devices is expected to decrease, while investment in contactless biometric technologies will increase significantly. So while other technology sectors deal with the aftermath of the pandemic and other limitations due to supply line disruption and market uncertainty, biometric software and algorithm developers will have the added responsibility of providing new screening procedures to assist global efforts on healthcare, border control and public safety levels.

Data privacy

ABI Research predicts that Covid-19 will also cause a chain reaction on the data protection front, putting additional pressure on citizen rights and related legislation, and circumventing a good deal of privacy concerns for the sake of additional surveillance and monitoring.

There is the potential for regulations regarding privacy and personal data to be scaled down. Already Google Cloud Premier Partner software company Ubilabs, which is based in Germany and provides data security and privacy consulting services, has voiced concern over the misuse of data due to the pandemic.

It therefore falls on governments and biometrics vendors to create citizen-centric solutions, and to add the necessary privacy controls. This will both assist in the worldwide effort to contain and monitor the virus outbreak; and also prevent the concentration of personally identifiable information (PII) and citizens’ biometric, healthcare and personal data falling into the hands of a few entities that have no visibility, no legislative barriers, no surveillance limitations, and no biometric revocation options for the foreseeable future.

This is not an organic transition, but rather a forced evolution for the biometrics market, and one that is very likely to yield quite volatile results over time, while shifting global priorities.

**“Covid-19 will cause a chain reaction on the data protection front. There is the potential for regulations regarding privacy and personal data to be scaled down”**

Augmented reality

As well as biometric technology, Covid-19 is having a big impact on the related augmented reality/virtual reality (AR/VR) market as well. Initially it has caused temporary delays in AR/VR device production, increased costs and revenue losses, especially in China, Taiwan and South Korea.

MAD Gaze, a Hong-Kong based consumer AR smart glasses provider, has announced delays in shipments, and changed its display panel supplier from a Chinese factory to Korean and Japanese factories due to production delays in Chinese factories. Nreal, a China-based AR consumer smart glasses provider, has announced production/shipment delays as well. At the same time, bigger companies with higher demand and larger-scale supply chains face similar issues, such as Oculus, HTC and Vive struggling to meet VR headset demand.

These delays in production and scheduled shipments, and potential decrease in demand, will have a huge financial impact on AR/VR device manufacturers, generating reduced revenue and unexpected extra costs for employee salaries or for alternative suppliers. Also, delays and reduced funding series are expected, mainly affecting startups. Finally, delays are anticipated in AR/VR application development and upcoming upgrades due to the cancellation of developer conferences (including Apple, Google and Facebook).

Meanwhile, long-term production and shipment delays will mainly affect smaller companies, especially those launching devices for the first time in the market (like Nreal or small VR companies). Delays may encourage potential customers to purchase products from competitors and bigger companies that are supported by large-scale supply chains and product stocks. Moreover, continuous delays of product delivery will negatively affect user experience (even if the delays are caused by unexpected reasons).

The impact will be more significant on new companies/startups aiming to get established in the market and build a reliable brand name. Delays will also push roadmaps into the future, and depending on how significant a reduction there is in demand and manufacturing capabilities, some suppliers may be unable to survive.

In summary, Covid-19 will undoubtedly have a profound impact on biometric, AI and related technology developers and markets – but of course, most importantly, on people’s lives.

About the author

Stuart Carlaw is chief research officer at ABI Research. He leads the company’s analyst teams covering global technology markets. Stuart’s primary responsibility is the management of industry research content, technology and market focus, subject matter guidance, product portfolio mix, custom and consulting as well as client engagements and strategic advisory provisioning. ABI Research provides strategic guidance and actionable intelligence on the transformative technologies that are reshaping industries, economies and workforces across the world. It helps companies and leaders increase market share, enter new markets, devise market and product strategies, and gain a better understanding of technologies, providers and their customers. For more information, visit www.abiresearch.com. To download ABI’s latest white paper on the implications of Covid-19 for a range of high-tech industries, visit https://abi.link/2UgJZrF.