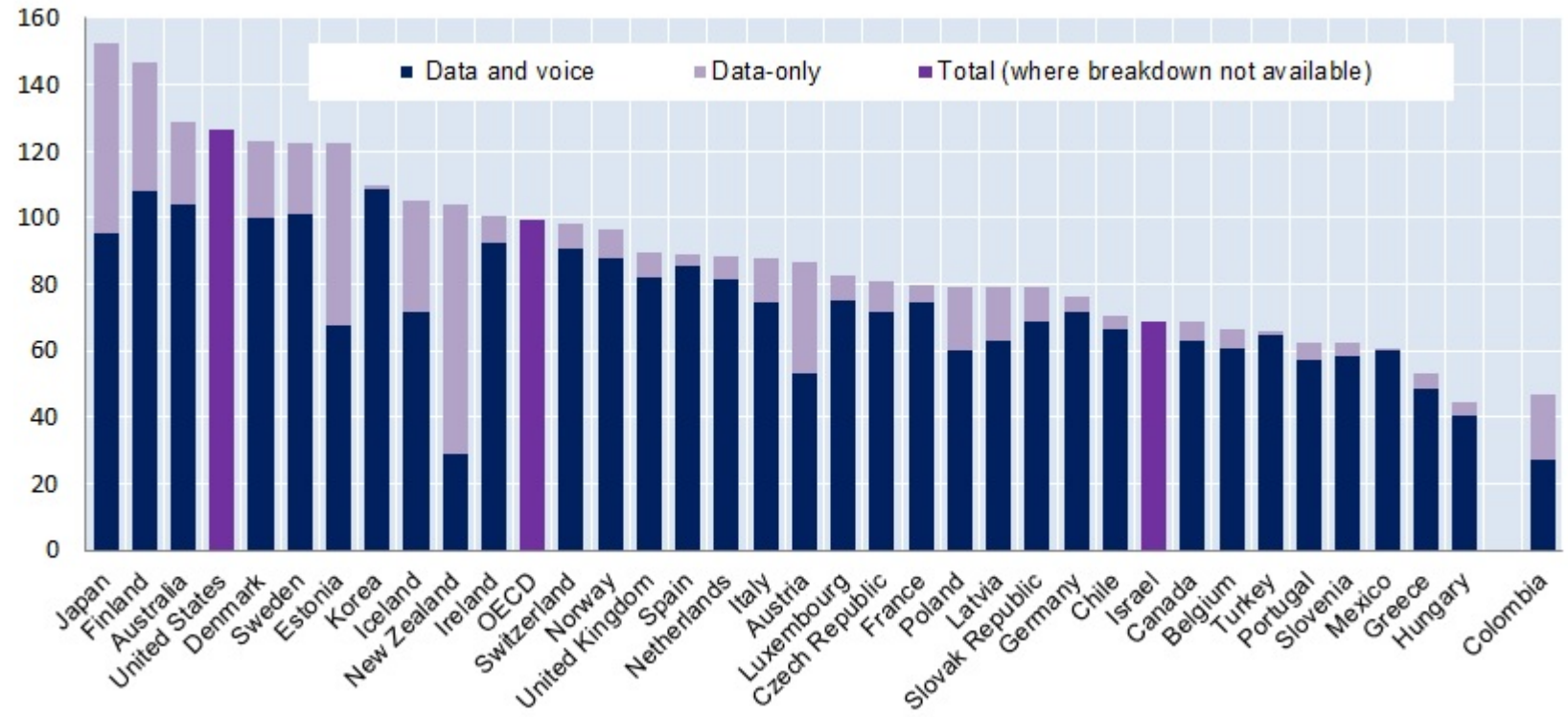
University of Newcastle
Department of Rural Health

THE COMPUTER WILL SEE/HEAR/PROBE YOU NOW-TECHNOLOGY AND RURAL COMMUNITIES

Prof Jenny May
Director-University of Newcastle Department of Rural Health

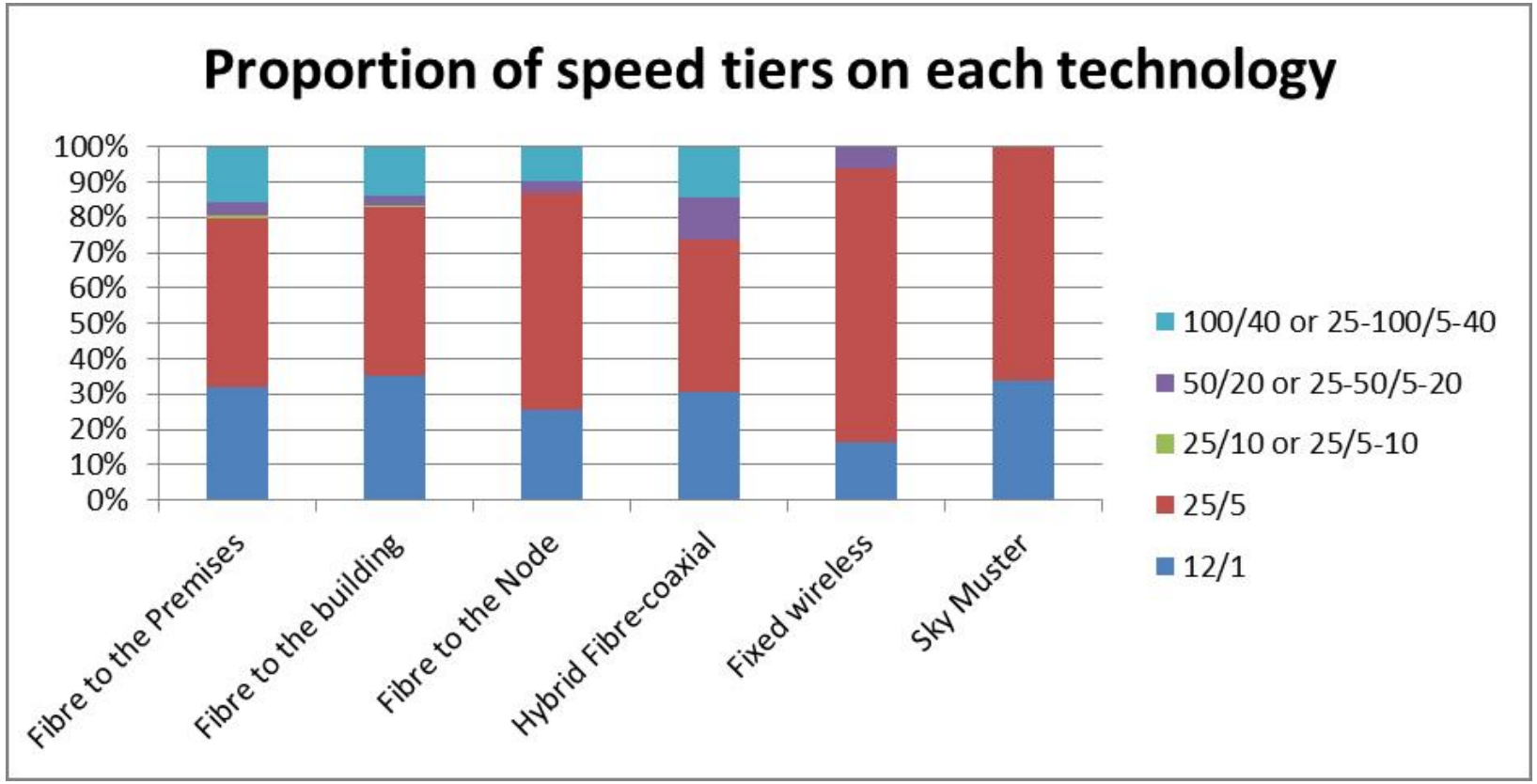
October 2017

OECD Mobile broadband subscriptions per 100 inhabitants (by technology), December 2016



http://www.oecd.org/sti/broadband/broadband-statistics-update.htm

ACC NBN Market report June 2017

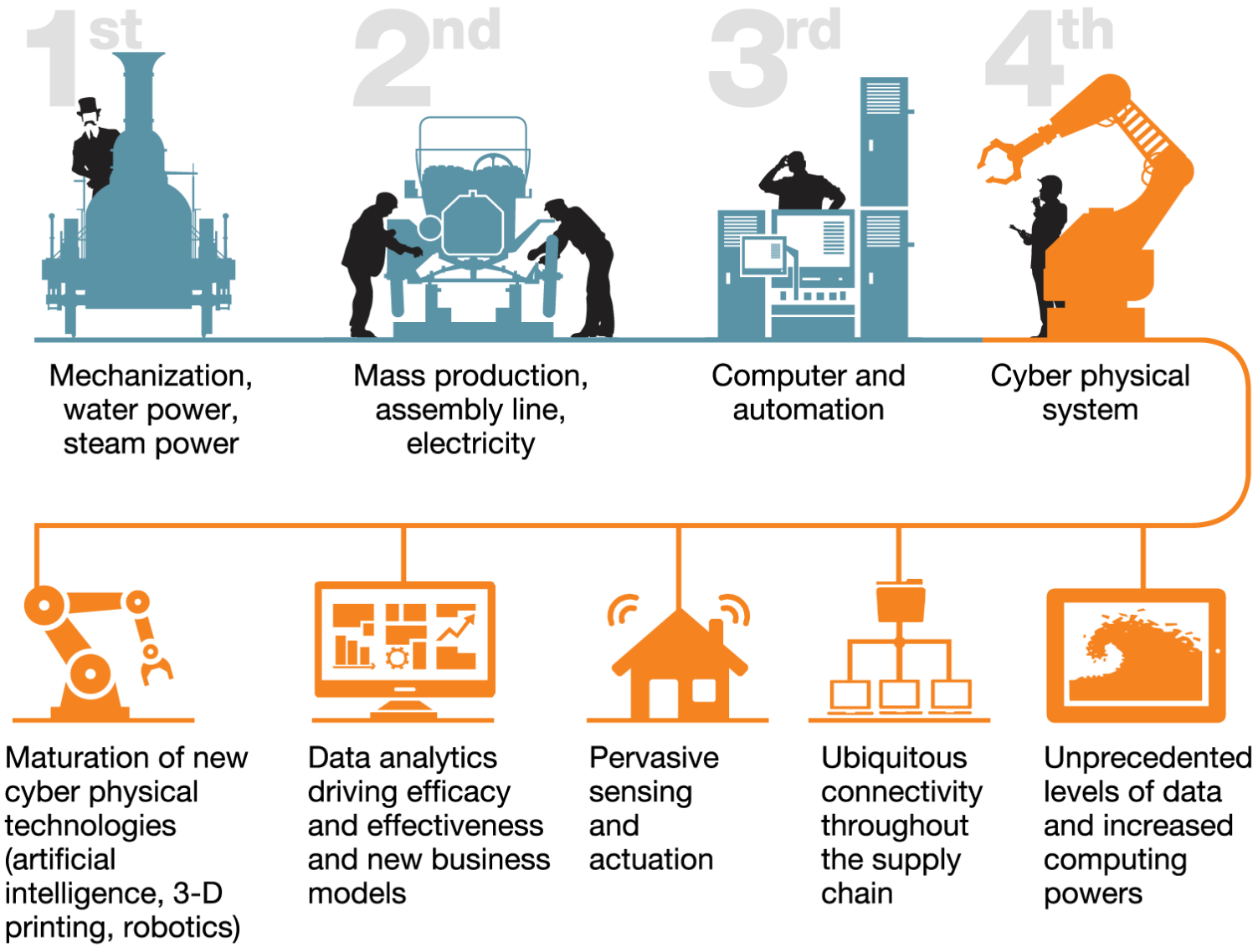


Better Access to High Speed Broadband for Rural and Remote Health Care - 2016

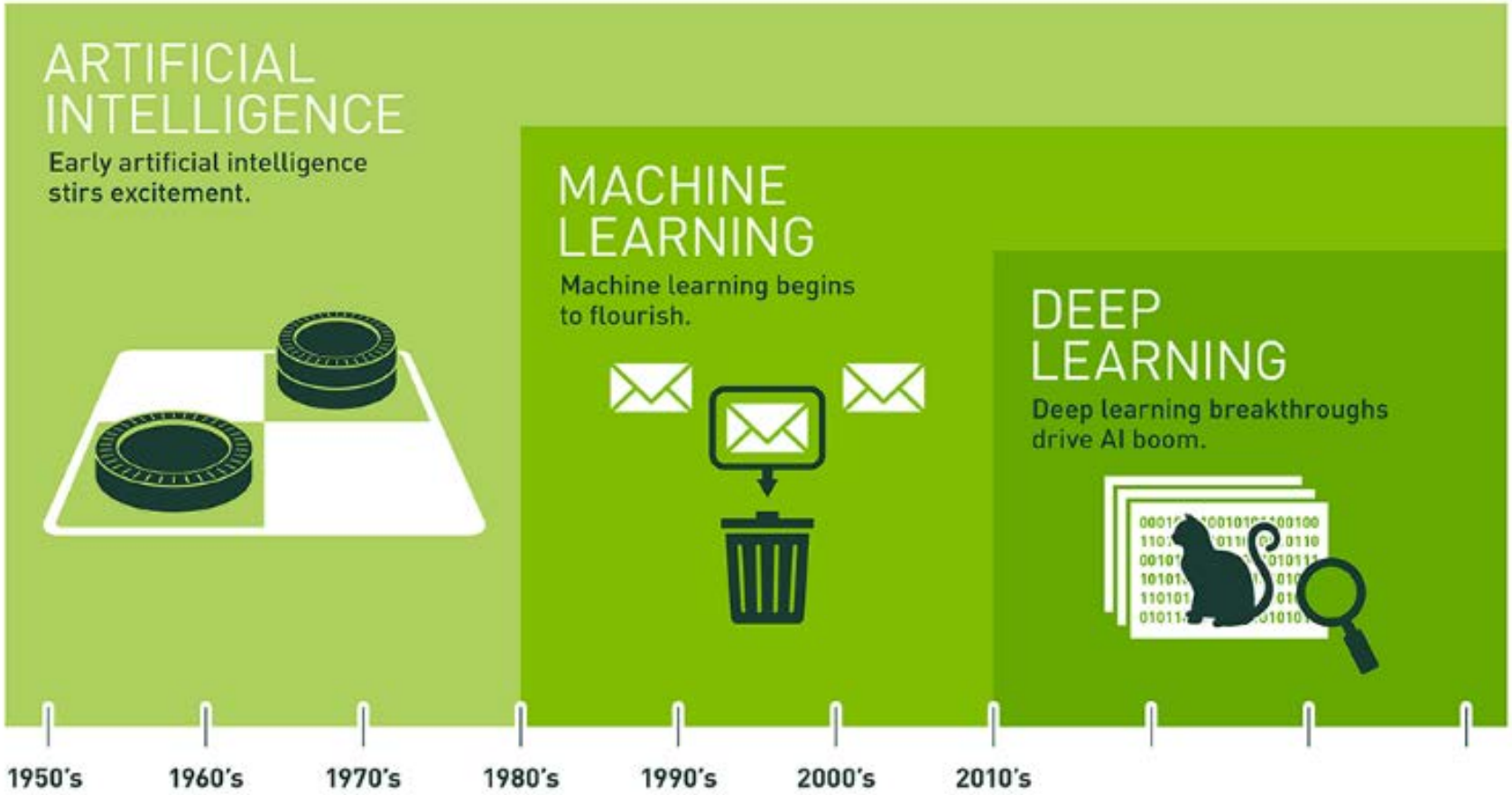
Extend the boundaries of the NBN's fibre cable and fixed wireless footprints and mobile coverage wherever possible.
Begin an incremental process of terrestrial network expansion over the longer term to address increase in usage over time.
Develop measures to prioritise or optimise the broadband capacity available by satellite for hospitals and medical practices, such as exempting or allocating higher data allowance quotas, or providing a separate data allowance (as is the case with distance education
Create universal unmetered online access to government, hospital and health services for people and businesses in rural and remote areas
Establish an innovation budget for development of local infrastructure solutions for rural and remote areas
Engage with state and local government and related stakeholders who wish to co-invest or coordinate planning to achieve the optimum overall infrastructure outcome for their area. This could involve public-private partnerships or the leveraging of philanthropic infrastructure funding through, for example, tax concessions.

https://ama.com.au/position-statement/better-access-high-speed-broadband-rural-and-remote-health-care-2016

In the fourth industrial revolution, digital analytics enables a new level of operational productivity.



McKinsey&Company | Source: *Forbes*; World Economic Forum



Since an early flush of optimism in the 1950s, smaller subsets of artificial intelligence – first machine learning, then deep learning, a subset of machine learning – have created ever larger disruptions.

Personal robot(FrankSteiner) 2011

Robotic movement sensing systems in the homes of elderly people can predict with a high level of accuracy when a person is at high risk of having a fall and send warnings to support workers or relatives

Western Journal of Nursing Research 2016

https://news.microsoft.com/en-au/features/australian-start-ups-promise-genuine-intelligence-for-everyone-and-every-organisation/#YB6ofdzYLGpcydGM.99

Mobile phone diagnostic tool to immediately detect viruses

By Leonie Mellor

Posted Tue at 7:22pm

A Brisbane-based scientist is developing a tool that can immediately detect viruses and bacteria across the world.

Professor Kirill Alexandrov of Queensland's Institute for Molecular Bioscience (IMB) said the tool could also be used to immediately detect serious disease outbreaks anywhere in the world.

To create the device, he re-engineered the existing technology behind simple blood glucose monitors used to monitor diabetes.

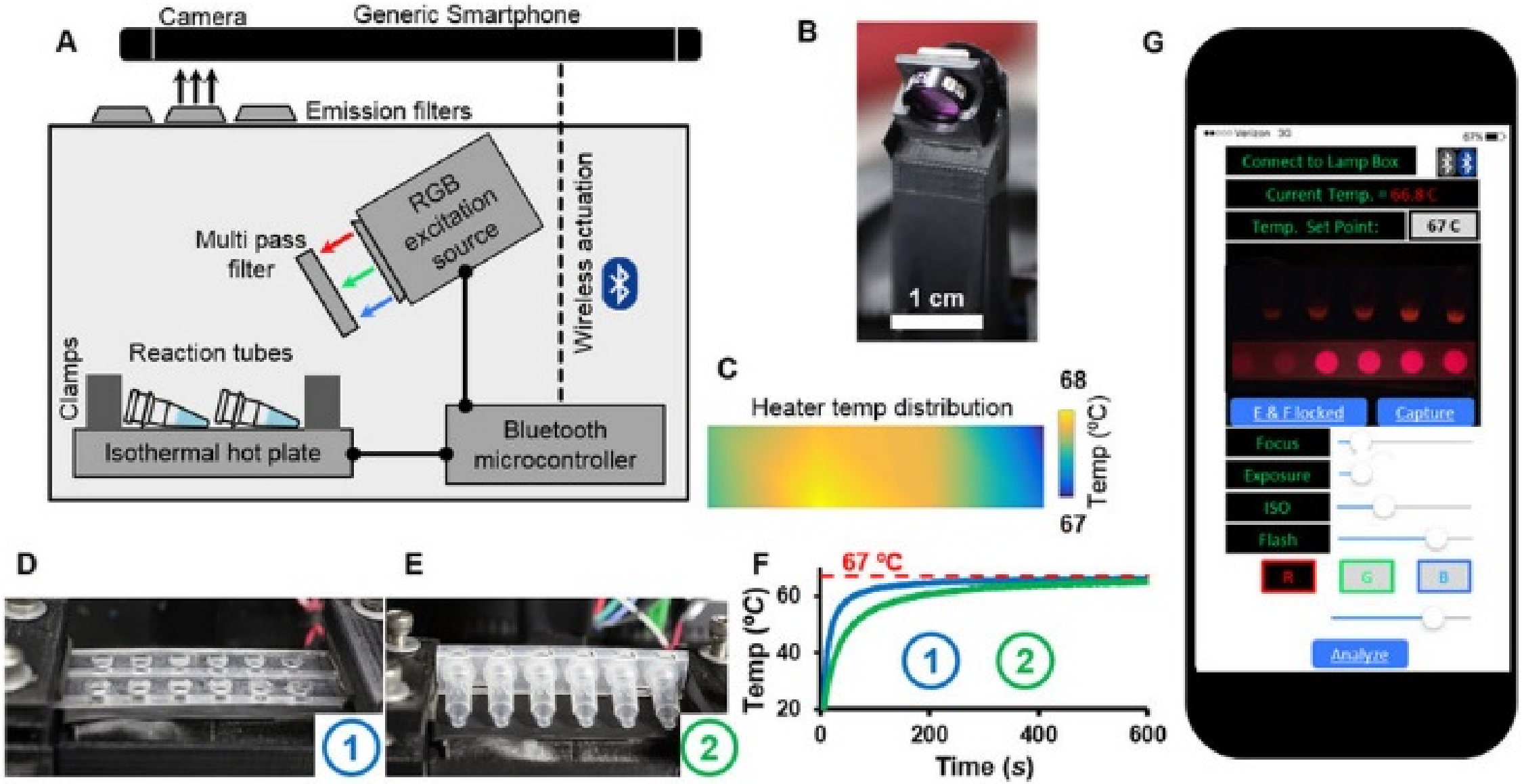
From this, Professor Alexandrov developed a biosensor that could track other serious diseases such as HIV, Zika virus or influenza through a DNA swab.

PHOTO: Professor Kirill Alexandrov with an early prototype of a diagnostic device. (ABC News: Leonie Mellor)

MAP: Brisbane 4000

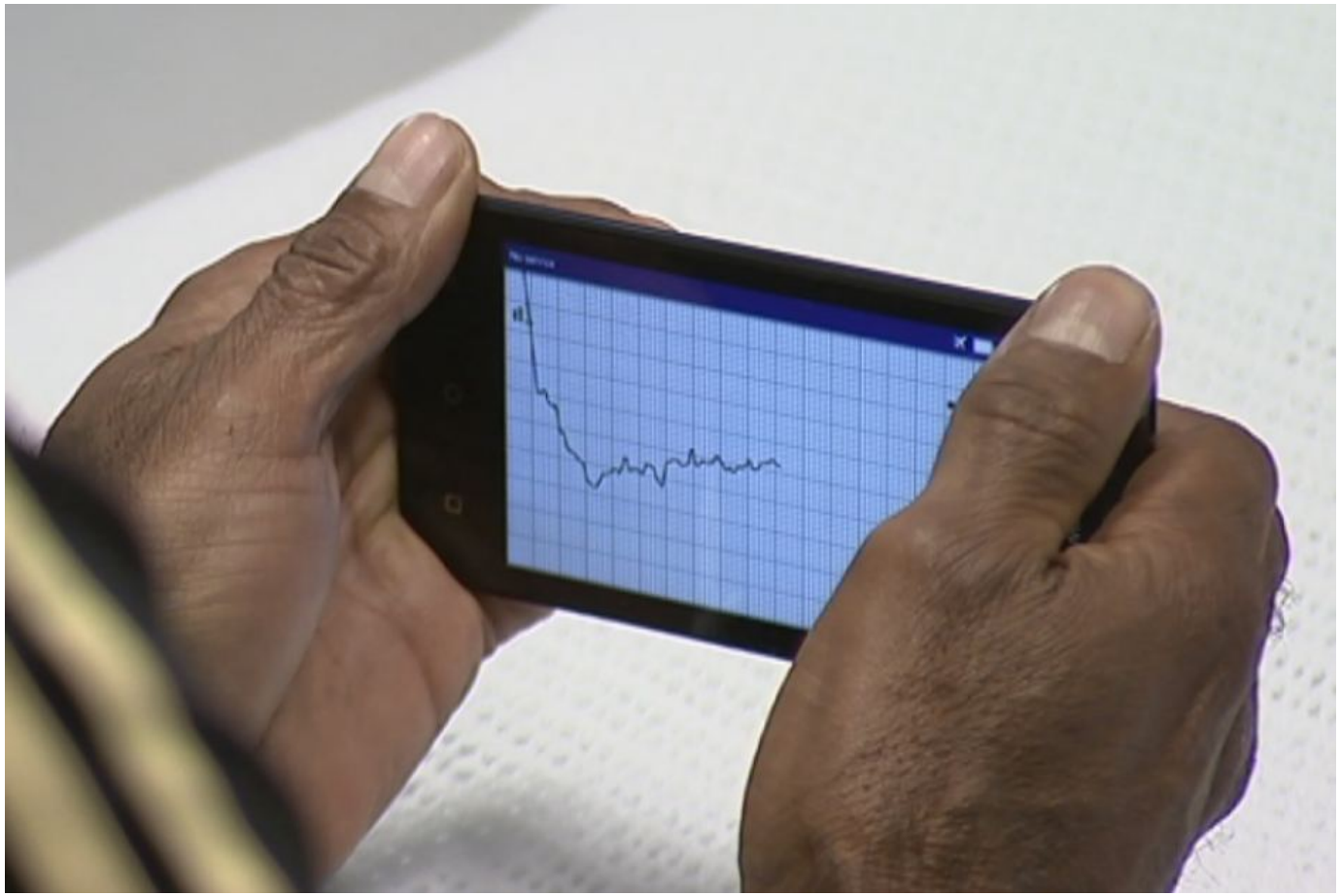
Professor Alexandrov and his team recently won a grant from the Bill and Melinda Gates Foundation to further develop the technology.

He said patients simply placed a blood or saliva sample onto a stick-like sensor then inserted it into a



A smartphone-based diagnostic platform for rapid detection of Zika, chikungunya, and dengue viruses Nature 26 Jan 2017

IEKG



"It was so funny because when we first got the little machine we would say to the people, 'now we've just come to have a little yarn to you, this is a machine that we've got and it's like a little ECG machine and instead of having all the cords on and it'll give you a reading of either normal or AF [atrial fibrillation]',"she said.

"And then they'd say 'oh go away, it's only a phone', and they thought we were pretending."

The patient places their fingers on connectors and holds on for 30 seconds.

The file is processed by an app on the phone which gives results almost immediately. (ABC news article 27 September 2016)

Inert Tablet
Contains Ingestible Sensor

Adhesive Patch
Up to 7-day wear during all activities

Confirms ingestion of Ingestible Sensor

Mobile Device
Encrypted data relayed to secure server

Secure Servers

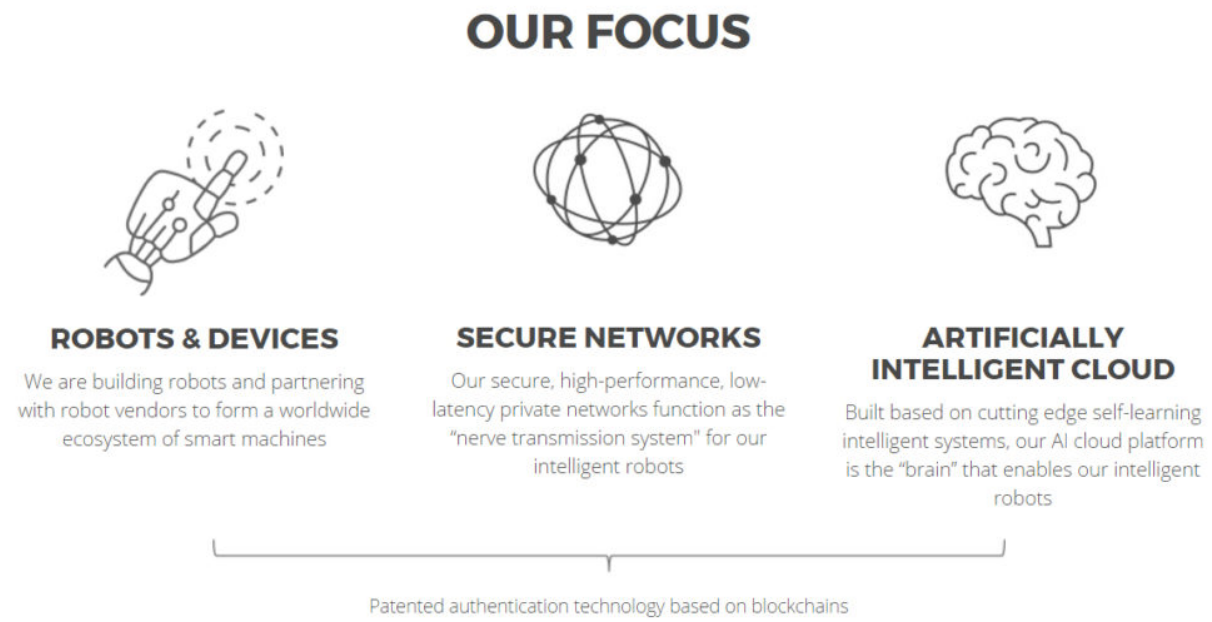
Provider Report
Report contains:

- Pattern & Regularity of medicines use
- Blood Pressure
- Circadian patterns of rest & activity
- Daily step count

Patient

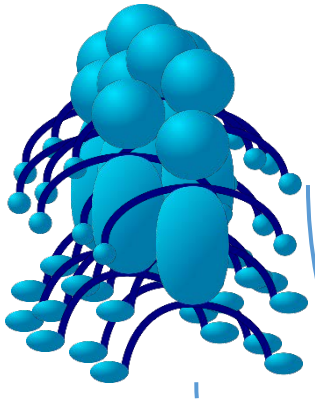
Provider

CLOUD ROBOTICS AND REMOTE PROCESSING



ABC news-Cameron Best 20 May 2016

Patients/community

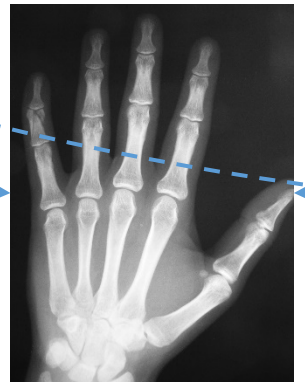


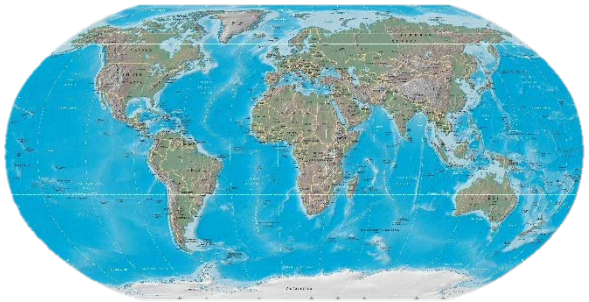
Pathology

Primary Care
GPs
Allied Health
Nursing

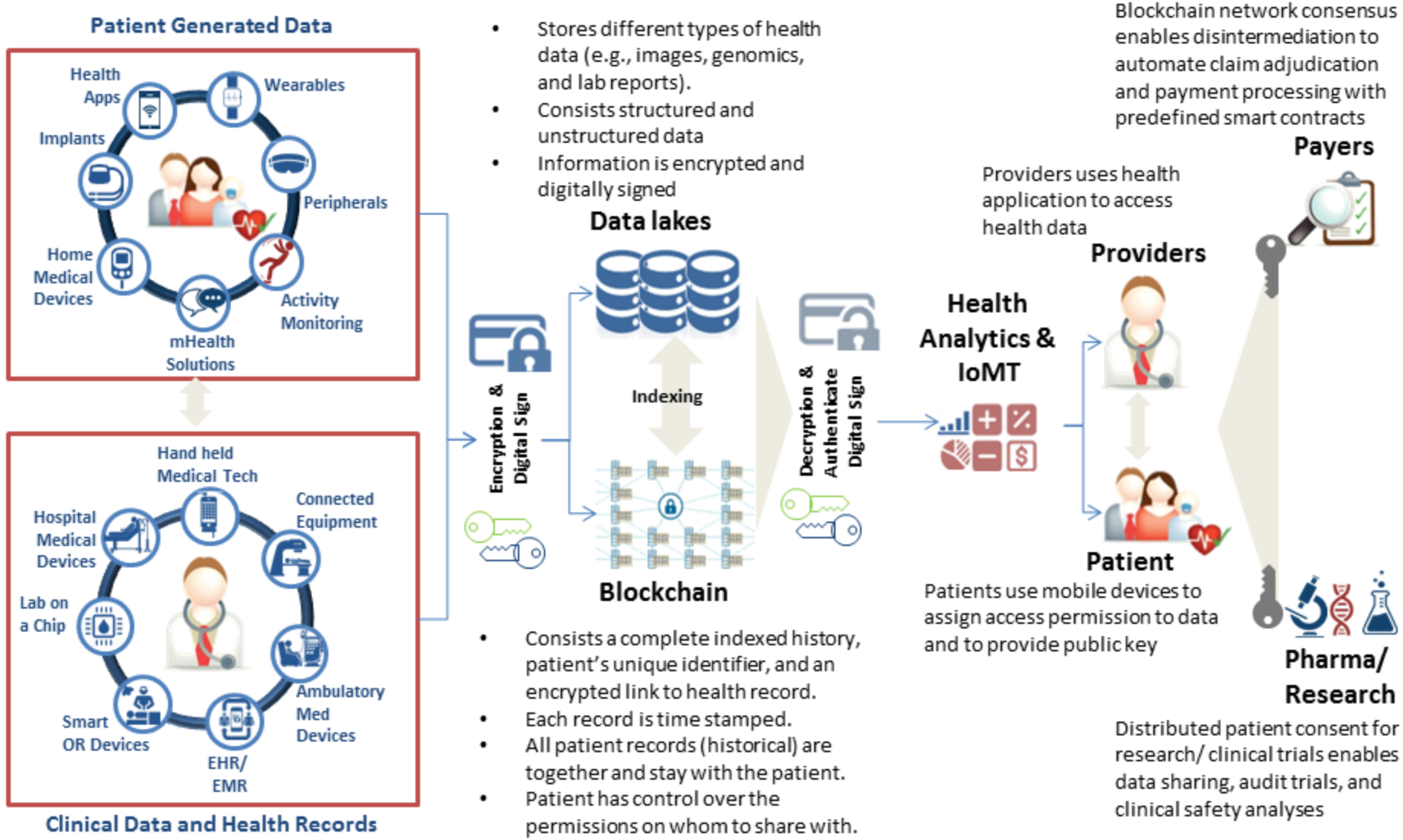
Secondary Care
Specialist Services

Diagnostic Imaging





Blockchain Technology – Promising Use Cases for Healthcare Industry



Source: www.healthit.gov; Frost & Sullivan

“Making systems work is the great task of my generation of physicians and scientists.” — Atul Gawande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So, which careers and jobs are going to be hot trends? What skills do I need to develop? For students and professionals, it is very important to understand that it’s time to evolve and brace the change. It would be silly to fight with machines and artificial intelligence. It’s time to evolve and acquire in-demand skills.

“ONE MACHINE CAN DO THE WORK OF FIFTY ORDINARY MEN, NO MACHINE CAN DO THE WORK OF ONE EXTRAORDINARY MAN” - Elbert Hubbard

Recently, we organized a webinar on **Global Careers of the Future**. It was an engaging and very informative session. Several insights were provided by the experts on the future careers, jobs and skills. Below are the top Q&A excerpts of the webinar.

What are Top 5 Hottest Fields of the Future?

1. Artificial Intelligence, Machine Learning, Automation, Cyber Security, Big Data and Data Analytics
2. Biotechnology, Biomedical Science & Biomedical Engineering, and Healthcare
3. Climate, Energy, Natural Resources & Environment
4. Liberal Arts, Design & Creative Technologies
5. Education and Skill Training