NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR

Submitted By:- Harshita Upendra Sakhare

Roll.No:- 21111049

Basics of Biomedical Engineering

Assignment-5

WRITE UP ON EMERGING TECHNOLOGIES IN HEALTHCARE

Submitted To:- Prof. Saurabh Gupta

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1 Acknowledgement

In successful completion of my assignment on WRITE UP ON EMERGING TECHNOLOGIES IN HEALTHCARE, I would like to thank my Professor. Saurabh Gupta Lecturer of Biomedical Engineering, who has guided and assisted me to complete the assignment. Without his support I would not have finished the assignment within time.

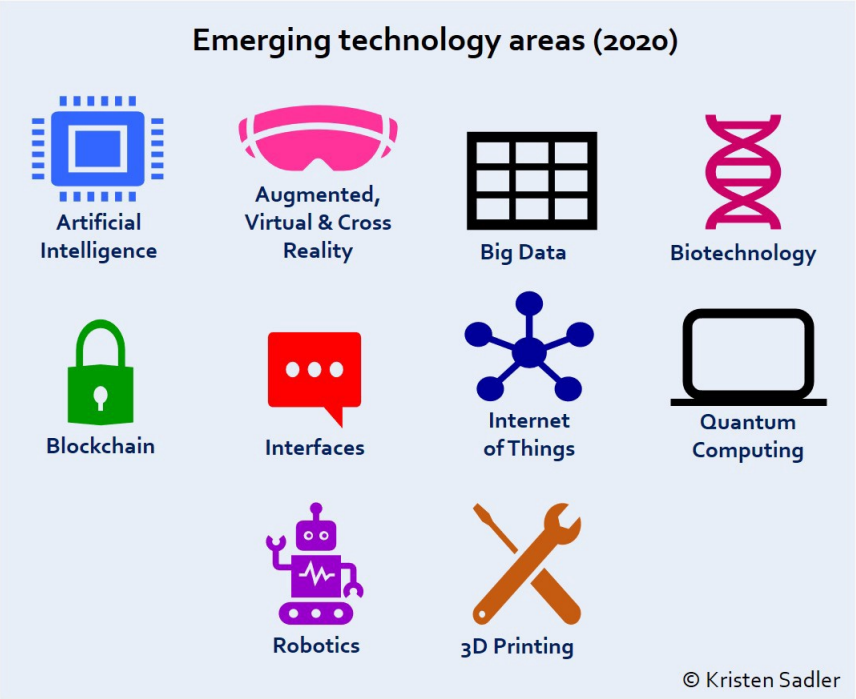
I would also like to take this opportunity to thank my friends and family members, without them this assignment could not have been completed in a short duration.

2 Introduction

Emerging Technologies are technologies whose development , practical applications, or both are still largely unrealized, such that they are figuratively emerging into prominence from a background of non existence or obscurity. These technologies are generally new but also include older technologies that are still relatively undeveloped in potential, such as gene therapy(which dates to circa 1990 but even today still has large and developed potential). Emerging technologies are often perceived as capable of changing the status quo.

Emerging technologies include a variety of technologies such as educational technology, information technology, nanotechnology, biotechnology, cognitive science, robotics, and artificial intelligence.

New technological fields may result from the technological convergence of different systems evolving towards similar goals. Convergence brings previously separate technologies such as voice (and telephony features), data (and productivity applications) and video together so that they share resources and interact with each other creating new efficiencies.



3 History

In history of technology, emerging technologies are contemporary advances and innovation in various fields of technology.

Over centuries innovative methods and new technologies are developed and opened up. Some of these technologies are due to theoretical research, and others from commercial research and development.

Technological growth includes incremental developments and disruptive technologies. An example of the former was the gradual roll-out of DVD(digital video disc) as a development intended to follow on from the previous optical technology compact disc. By contrast, disruptive technologies are those where a new method replaces the previous technology and makes it redundant, for example, the replacement of horse-drawn carriages by automobiles and other vehicles.

4 Emerging Technologies in Healthcare

Healthcare technology is poised to reshape the industry as we know it and provide more advanced and efficient patient care. Just as other industries have had to adapt and evolve as new technologies have emerged, healthcare organizations must keep up with healthcare technology trends not only to stay competitive but to also be able to provide the best possible patient outcomes. While there are many exciting new developments in the world of healthcare technology.

Emerging technologies in the healthcare industry are being introduced at a rapid pace, bringing with them the promise of improved treatment options and more efficient care. This is especially important for healthcare facilities that are seeking solutions to deal with staffing shortages or other limitations.

5 Some Examples of Emerging Technologies in Healthcare

1. Artificial Intelligence

AI is transforming the way healthcare organizations manage and draw insights from the incredible amount of scientific data and patient information that's available. AI can be used to create and customize treatment plans and medication options for patients in a much faster and precise way than human healthcare teams can do on their own. AI can also help in other ways, such as advancing the field of genomic medicine by analyzing complex genetic information to determine the best course of care for individuals based on their DNA. The hope is that AI can one day improve diagnostic accuracy and even predict health outcomes.

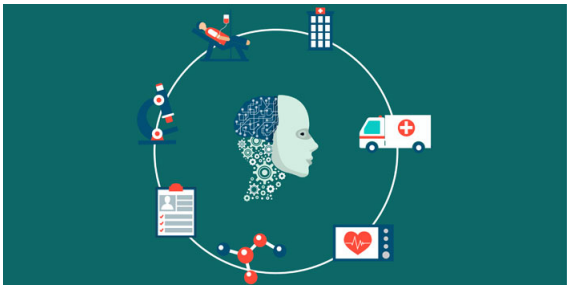


Figure 1: AI in Healthcare

2. Electronic Health Recorder

Emerging health information technology has made it possible to maintain health records in a centralized,cloud-based portal, which provides healthcare professionals and patients with instant access to medical histories. As such, healthcare providers have all the information they need at their fingertips, which can be crucial in the case of an emergency, if there is a language barrier, or if a patient is unable to communicate. This type of healthcare technology is also ideal or medical offices need to collaborate about patients who have complex medical files or diagnoses to determines the most optimal way to treat their condition.

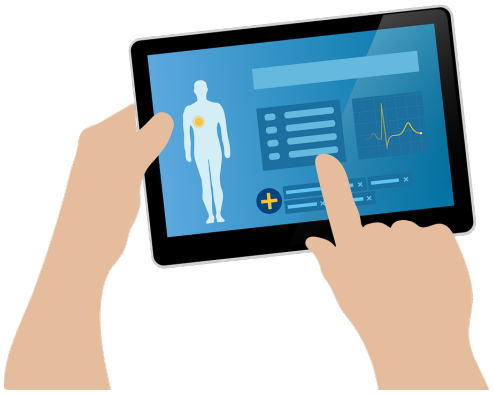


Figure 2: Electronic Health Recorder

3. Wearable Technology

Today's smart watches and other wearables do a lot more than count steps. They can monitor heart rates, track sleep patterns, detect heart issues like atrial fibrillation, take your temperature, act as ECG and blood pressure monitors, and more. Wearing these devices allows patients to monitor their own health, which can help identify potential problems. And, they can also share the reporting and data with their physicians as needed. Wearables can also be helpful to monitor post- surgical patients and track their vital signs. Beyond smart watches, other wearable medical devices are coming to market (or are already being used) that let patients and their healthcare providers monitor glucose levels, oxygenation levels, and measure hand movement in Parkinson's patients. In the future, other wearable technology may be embedded in eyeglasses, clothing and other devices.

Figure 3: Wearable Technologies

4. 3D Bioprinting

The invention of 3D printing is another new technology in the healthcare industry that is proving to be transformative. This new field of 3D Bioprinting enables physicians to print artificial limbs, organs, joint replacement parts, and bio tissues. In addition, in the field of pharmacology, there are ongoing experiments for printing pills and other medications. Lastly, 3D printers can also help create medical devices and surgical tools.

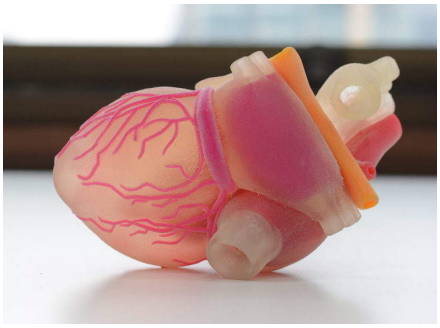


Figure 4: 3D Printed Heart

5. Robotics

The field of robotics has made great strides as well, making it a top healthcare technology trend. Medical robots can help surgeons perform very precise and targeted procedures and therapies. Though the doctors still control the surgery, robots take away the possibility of human errors and can potentially reduce infections. Healthcare robots are also poised to take over clerical and routine tasks to free up nursing and other healthcare professionals to focus more on direct patient care.

Figure 5: Robotics in Healthcare

6 Hype Cycle Emerging Technologies of Last 3 Years

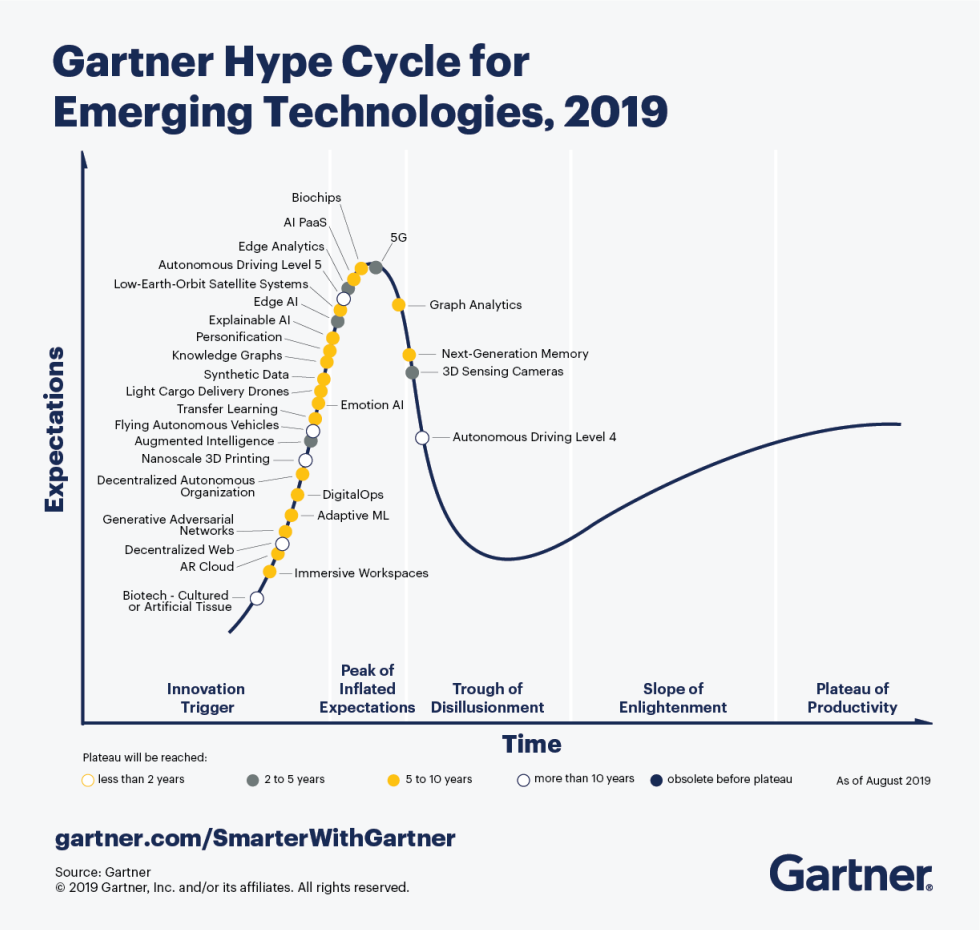


Figure 6: Emerging technologies in 2019

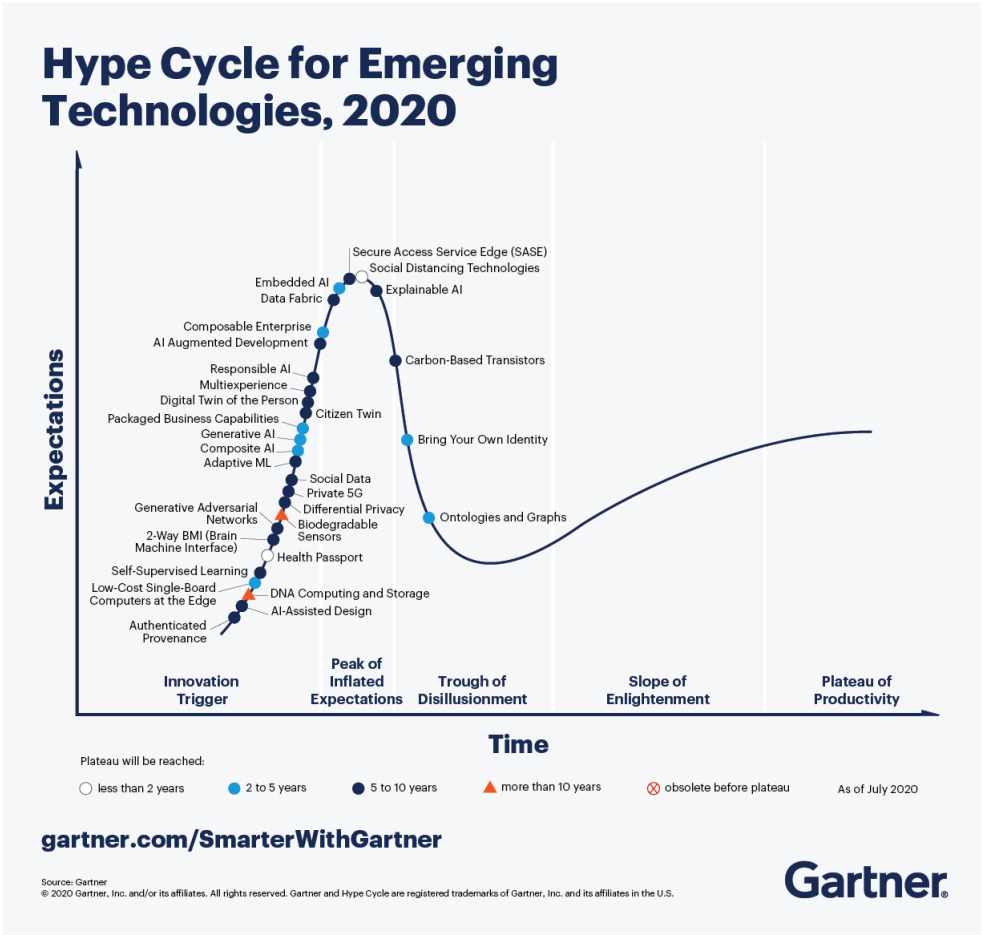


Figure 7: Emerging technologies in 2020

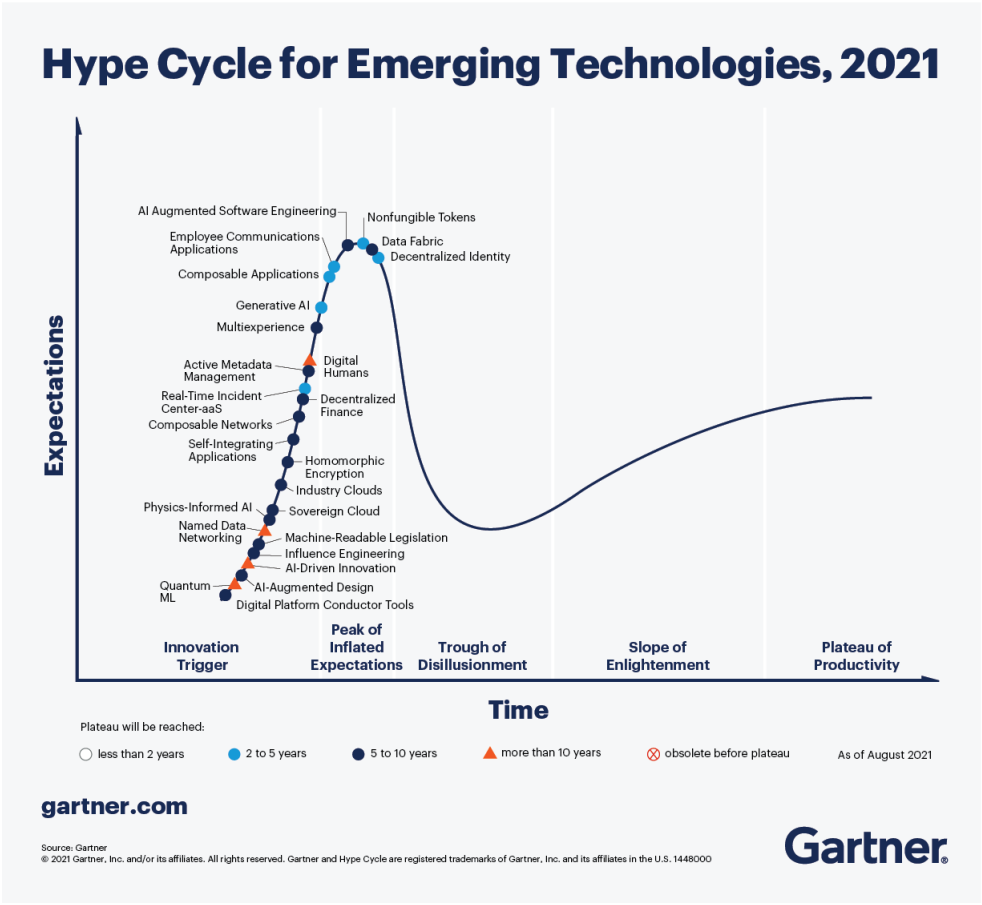


Figure 8: Emerging technologies in 2021

7 Conclusion

The future of medicine and patient care will increasingly rely on health technology, which is why healthcare organizations must embrace emerging healthcare technologies to stay relevant in the coming years. By exploring healthcare technology trends and becoming an early adopter of new innovations, healthcare providers can provide cutting- edge care.

8 Reference

- Wikipedia
- americanexpress.com