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Module :Digital skills & Research

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The use of technology in the modern healthcare workplace:

Chosen Healthcare: Hospital

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Introduction:

I am required to conduct secondary research on the use of technology in the modern hospital healthcare workplace. I will explore the technology and communications systems that are used within hospitals. My report will show my current understanding and awareness of relevant legal, ethical and security issues. My contents will show my points then move onto my references. I will attempt to show my understandings in all of the different aspects we have covered in class. For my references I will try to show my understandings in all of the different aspects we have covered in class.

Abstract

Technology in Healthcare is among the fastest-growing sectors in both the developed and emerging economies. Healthcare changes all the time due to new technological developments happening everyday. I personally feel we couldn't survive without technology: each year we are learning more and more and new inventions are being created although we get to see the details of future trends in healthcare, we need to be clear about the

inventions so we can align with them and actively work to ensure the best outcomes for society as a whole.

The use of technology in different healthcare sectors varies in each workplace. I will be researching technology and ways in which it helps within hospitals. Doctors are able to contribute patient data and diagnosis information to a massive database accessible to physicians all around the world. Doctors now have instant access to patient health data that can aid early diagnosis and prevention. One of the biggest developments in patient communication has come in the form of online medical records portal and wearable devices as well as

Divall, P., Camosso-Stefinovic, J. and Baker, R. (2013). The use of personal digital assistants in clinical decision making by health care professionals: A systematic review. *Health Informatics Journal*, 19(1), pp.16–28. doi:10.1177/1460458212446761.] .

Smart watches, for instance, allow patients to share information on their physical activity and heart rate as well as fitness i.e. calculating the amount of steps an individual walks. Online portals make it easier for doctors to be alerted to diabetic patients with blood sugar irregularities, as long as they are wearing an insulin monitor the technology allows a glucose reading to be taken. Other medical apps and accessories like iPads/smartphones and tablet devices can now be used to conduct routine examinations speeding up diagnosis makes treatment easier and more effective, and it can also lead to better patient outcomes. Tablets have therefore reshaped the routine of patient's care, emergency treatment, and even the diagnosis of terminal diseases.

Mosa, A.S.M., Yoo, I. and Sheets, L. (2012). A Systematic Review of Healthcare Applications for Smartphones. *BMC Medical Informatics and Decision Making*, [online] 12(1). doi:10.1186/1472-6947-12-67

Administrative Technology in hospitals

Although doctors and nurses are seen as the 'brains', they rely on healthcare administrators to keep their clinics, hospitals and practices running smoothly. Careers in this profession require leadership skills, in-depth knowledge of health care delivery and financial structure, an understanding of medical language and how patient care is structured and how it operates. Healthcare administrators are the people responsible for the day-to-day roles within the hospital and practises ranging from the least important to the most important. The admin side of things keep the schedules and arrangements flowing. When visiting a hospital ward, you will always come across a nurse at the reception to book in appointments and log personal details of the patient, then in the same area another computer, this is usually the one for recording and storing business data rather than filing it in physical folders. Each patient's medical history — including previous treatments, tests, diagnosis, symptoms and more can be found as we are now in the twenty first century, we no longer use handwritten notes, health information technology makes it available in a matter of moments as it is all now electronic. In one of our lesson's we also went over where the data is actually saved In the cloud. IBM is the only cloud provider using the highest-level encryption certification technology with a dedicated hardware-security module. This means that only you can have

access to your data. With IBM Cloud, healthcare institutions of all sizes can operate quickly delivering services that meet industry demands.

[www.ibm.com. \(n.d.\). IBM. \[online\] Available at: https://www.ibm.com/en?utm_content=SRCWW&p1=Search&p4=43700068536348170&p5=e&gclid=117374134d5a1bd6b8541661e036ea87&gclidsrc=3p.ds](https://www.ibm.com/en?utm_content=SRCWW&p1=Search&p4=43700068536348170&p5=e&gclid=117374134d5a1bd6b8541661e036ea87&gclidsrc=3p.ds) [Accessed 4 May 2022].

Virtual Reality:

Healthcare is one of the biggest adaptors of Virtual Reality, There has been a huge increase in the use of VR in the healthcare sector and while researching I have found some really interesting facts, one of which is being able to view the inside of the human body allowing patients to be taken through their surgical plan by virtually stepping into a 360° VR of their anatomy to view treatments, procedures and diagnosis. Surgeons are currently using tools that range from VR headsets to haptic gloves to mimic real surgical procedures.

VR is also used as a diagnostic tool that allows doctors to give a diagnosis in conjunction with other methods such as MRI and CT scan's .

"To alleviate the discomfort of getting an MRI scan, researchers developed a virtual reality system to distract the patient. This VR system incorporates the sounds and movements of an MRI into the experience to fully immerse the patient" - .

Nakarada-Kordic, I., Reay, S., Bennett, G., Kruse, J., Lydon, A.-M. . and Sim, J. (2020). Can virtual reality simulation prepare patients for an MRI experience? *Radiography*, 26(3), pp.205–213. doi:10.1016/j.radi.2019.11.004.

Virtual Reality can also be used as an empathy tool. Some hospital systems are using VR simulations as a way for doctors to have a better understanding of what their patients are actually going through.

Emerson, D., Kobashigawa, J., Levine, R., Moriguchi, J., Megna, D., Chung, J., Ramzy, D., Trento, A. and Esmailian, F. (2020). Single-Center Outcomes of Heart Transplantation in Patients with Pulmonary Hypertension Bridged with Mechanical Circulatory Support. *OBM Transplantation*, 4(3), pp.1–12. doi:10.21926/obm.transplant.2003114.

Pros V cons on virtual reality

My research on pros v cons involved me asking a group of independent people what they think, listed below are some of the most important findings of the experiment.

Pros

Gives a clearer insight - Virtual reality gives a more clear and detailed view of a place. For example tourism sites more interesting and easy. It gives in more details a clear view of a place where you want to visit. So people can plan their trip by seeing the real locations of

that place. users can also see the important landmarks as well important places in which they are interested to go so instead of paying hundreds of pounds to visit a certain place they can visit the same place in VR

Used in different fields - virtual reality has been used in different fields such as in military, education and as discussed health care. It adds the more dimensions in various fields. Virtual reality used in aviation and architecture for viewing the final product.

Fun – VR will allow gamers to experience vibrant new worlds up close, and the experience will be lifelike. This is why people enjoy it so much because it is an out of world / body experience it will also be possible to simulate movement much more accurately. It will be a complete paradigm shift and a much more physical experience.

CONS

Cost - While VR is amazing, its equipment is often expensive. Even with the cheapest counterpart, you will have to spend a good amount of money on the infrastructure of VR

Addiction – People get addicted to it and tend to enjoy it more there than in the real world. This eventually leads them to become isolated from the real world. Addiction is known to bring several health problems such as depression, anxiety, etc, and no amount of training they do in the virtual world will make them perfect, so all the experience acquired will never be recognized as real or sufficient.

Physical side effects – Sickness. Eyestrain, back pain, cough, Headaches

Conclusion

My overall conclusion of Technology in Healthcare on a whole is that it has a major part to play when performing procedures, We have seen how much technology has grown by taking a closer look at operations and procedures and we can now see that technology is really now relied on. We can also see how much technology in hospitals has resulted in an increase in its demand for medical treatments. I feel that one of the most important things that technology has brought to light is that diseases and infections can now easily be pinpointed and appropriate treatments can be taken right from the start. This obviously has a greater chance of its cure. With the use of new technology for example machines and procedures it leads to accurate and reliable treatment to offer the best level of care to the patients. Although I have touched on technology such as robots/ gloves /VR there are other aspects of technology that get used every day on every ward. Hospital rooms have now become equipped with a digital network system, technology such as machines that monitor your Blood pressure, heart rate, your breathing pattern even the bed that patients are laying in. While researching the beds I came across an article:

'The Med Pods or Beds allow users to diagnose, treat and perform a wide range of surgical procedures with ultra fine-laser incisions that are guided by 3D anatomical scanning.

The 3D scanning has refractory lenses that take live scans of the body in order to do various medical procedures.'

El sheikh, H., Abdel Aziz, S. and Abdel Rahman, R. (2021). Value of Ultrasound Examination of the Mastectomy Bed. *Benha Medical Journal*, 0(0). doi:10.21608/bmfj.2021.91615.1460

As I previously mentioned robotic services - robotic systems that accomplishes varied types of duties ranging from delivering medical supply and food to assist in surgeries and performing delicate operations, even helping transport medicines from the laboratory to the doctors and surgeons in the operating theatre.

"In some countries, hospitals are now equipped with robots that feature screens to conduct video consultations without the need to enter the patient's room, which allows more frequent contact with patients without the need to wear the full protective gear."

Berger, P. and Wolling, J. (2019). They Need More Than Technology-Equipped Schools: Teachers' Practice of Fostering Students' Digital Protective Skills. *Media and Communication*, 7(2), p.137. doi:10.17645/mac.v7i2.1902.

Benefits of Technology within hospitals

I believe that the benefits of technology is endless due to the most important being itn has saved many lives and been able to educate people from all over the world although I have touched on innovative inventions other types of technology as we have seen during the awful pandemic that other types of technology has been just as important such as video calls 'Zoom' emails and other apps which all helped towards staying at home and not spreading the deadly covid virus and being able to keep in touch with our loved ones which had a great effect on our wellbeing and mental health. These forms of technology was and are now more frequently used day to day.

My understanding and awareness of relevant legal, ethical and security issues.

My current understanding and awareness of some relevant legal, ethical and security issues within the healthcare can be:

Patient confidentiality- This is the Patients information and should only be available to the physicians and other healthcare personnel as required.

Informed consent - Providing an understanding of the risks and benefits of a treatment to a patient. This allows the patient to decide if they still wish to proceed with the procedure. However, there are many differences between legal and ethical standards. I personally feel that I lack knowledge on the ethical and legal issues however I aim to research more on this so I have better understanding.

References:

Berger, P. and Wolling, J. (2019). They Need More Than Technology-Equipped Schools: Teachers' Practice of Fostering Students' Digital Protective Skills. *Media and Communication*, 7(2), p.137. doi:10.17645/mac.v7i2.1902

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