ENVISIONING MY FUTURE

A 2000-word essay to clarify and reinforce my career goals

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1.0 Introduction

Though the use of technology to solve problems is far from a new concept, technological advancements have significantly changed the way we live over the past 50 to 100 years. Communication, transport, entertainment, health and finance are all examples of industries that have been greatly impacted by technological innovations developed in the 20th and 21st centuries.

Aside from the established technologies that are now considered a staple in our day to day lives, emerging technology trends currently being developed or are to be developed in the next five to ten years are set to change and improve many fundamental tasks and interactions including how we work, travel and communicate with each other (Department of Industry, n.d.). One of these innovations is augmented reality which has been in the works for several decades, but recent advances and the growth in investments in the field give evidence that AR could soon be the next big commercial commodity.

In the subsequent sections, we are going to discuss the significant use cases, benefits, concerns and influence that augmented reality could have as an emerging technology as well as how this interest of mine could affect my prospective career opportunities in the I.T. industry (Isberto, 2018).

2.0 Body

2.1 What is Augmented Reality (AR)?

Augmented reality (AR) is the integration of digital information within the user's environment displayed in real time. Unlike virtual reality which creates a totally artificial environment, AR uses the existing environment and overlays new information such as sounds, images and text on top of it (Rouse, 2016). As both virtual and real worlds harmoniously coexist, users of augmented reality experience a new and improved natural world where virtual information is used as a tool to aid in everyday activities (Rolle, 2018).

2.2 The Past and Present of AR

Although the term 'augmented reality' was not coined until 1990 by Boeing researchers Thomas Caudell and David Mizell, the basic concept of AR was first mentioned by author L. Frank Baum in 1901 who mentioned the idea of an electronic display that overlays data onto real life. However, this was not set in motion until the first technology behind AR began in 1968 when Harvard professor and computer scientist Ivan Sutherland developed the first head-mounted display system which he called the "Sword of Damocles". This system used computer-generated graphics to show users simple wireframe rooms and objects.

The next big development occurred in 1974 when computer artist Myron Krueger built "Videoplace", an artificial laboratory that combined projectors with video cameras that emitted onscreen silhouettes, surrounding users in an interactive environment.

In 1992, Louis Rosenburg from the U.S. Air Force Armstrong's Research Lab created the first real operational AR system known as "Virtual Fixtures". This robotic system enabled the overlay of sensory information on top of a workspace to help with human productivity (Interaction Design Foundation, 2018).

Since then, there have been many breakthroughs in augmented reality with a recent shift towards products available for consumers, rather than a sole focus on enterprise solutions.

2.3 Use Cases for AR

Augmented reality has been explored and has several real-world applications in a variety of industries from entertainment with the popular Pokémon Go mobile game to other markets such as healthcare, retail, education and much more. As the technology progresses, businesses have been increasingly interested in utilizing AR to drive their marketing strategy, customer engagement and sales. This interest will continue as innovators continue to explore the relevance and roles that AR can have in the workplace, giving much promise for it to revolutionize the way businesses operate.

2.3.1 Education and Training

Augmented reality in education will soon affect the conventional learning process. As most young people now have access to smartphones, the potential of combining these devices with AR could grant students extra digital information about any subject and make complex information easier to understand (Aleksandrova, 2018). Furthermore, AR could make learning itself more fun and enticing, helping educators engage students in the classroom.

The great thing about the use of AR is that is not just limited to a single age group or level of education, it can be used equally well in all levels of schooling; from pre-school education to university. Additionally, AR can help in a corporate setting, with safe and efficient workplace training and to assist with mastering practical skills required for a specific job.

Despite the benefits, there are certain pitfalls that should be considered when building solutions for AR in a learning environment. Teachers may lack the necessary skills to utilize this new technology and augmented reality's dependence on hardware poses clear challenges for educational institutions, with only the most innovative currently allocating resources to applying augmented reality applications in education.

Though the use of augmented reality in these fields is still new and unsettled with questions regarding how it compares to traditional teaching methods, there is much optimism for the future of AR in education and training as it poses immense possibilities.

2.3.2 Medicine and Healthcare

The application of augmented reality technology is opening many new opportunities in the healthcare industry. AR can help enhance doctors and surgeon's ability to diagnose, treat and perform surgery on their patients more accurately by giving them access to real-time data and vital statistics faster and more precisely than ever before (Sanchez, n.d.).

In relation to what is discussed in section *2.3.1* regarding education and training, AR allows medical students to visualize the vast amount of knowledge and theory behind surgical procedures, human anatomy and treatment protocols, helping them to grasp complex concepts more easily with such interactive experiences.

Right now, the use of augmented reality technologies in medicine and healthcare are at an early stage, but forward-thinking healthcare providers, both private and publicly funded continue to investigate the benefits of augmented reality as well as any obstacles that need to be surmounted.

2.4 AR Hardware & Software

Augmented reality relies on a variety of technological innovations including general hardware components such as the processor, display, sensors and input devices to achieve its functionality.

Modern mobile computing devices like a smartphone as well as other systems capable of displaying AR data such as optical projection systems, head-mounted displays, smart glasses and contact lenses contain elements including a camera, accelerometers, GPS and solid-state compasses, thus making them suitable platforms for AR.

A lot of the focus around augmented reality at present is developing software to complement and take advantage of these hardware capabilities. The Augmented Reality Markup Language (ARML) data standard is being used to standardize XML grammar for AR, while several software development kits (SDK) and toolkits such as ARCore from Google and ARKit from Apple are being designed to simplify AR development.

2.5 Concerns and Limitations of AR

As with any emerging technology, there are some challenges and limitations to overcome before we see mainstream adoption. Being able to recognize risks to consumer security, privacy and safety is the first step to resolving long-term vulnerabilities that augmented reality can create. What sets AR apart from other technology is its immersive nature. Allowing technology to directly mediate a person's perspective of and interaction with the physical world presents exciting opportunities, but it also makes safety concerns much more pressing compared with issues raised by more traditional technologies such as phones or laptops, which don't directly affect our view of reality.

2.6 The Future of AR

Moving forward, augmented reality is being increasingly adopted, with more and more people working on it, and many billion-dollar companies such as Facebook investing in it. Experts claim that by 2025, the AR/VR industry will be worth over $25 billion and steadily rising. There are already thousands of career opportunities involved with augmented reality and this will only continue to grow with new job prospects including those in the process of software development, project management and design architecture.

3.0 Conclusion

In 5 to 10 years, relative evidence suggests that augmented reality will be a fundamental technology and will help shape the future of how we work and play. Not far from now, we will able to live in a seamless world where digital information blends naturally into the physical world (Sarvaiya, 2019).

Furthermore, completing my Bachelor of Information Technology gives me the necessary skills and knowledge to pursue a software development or related career in augmented reality. Aside from this, being able to familiarize myself with technology trends early and attending conferences, meetups and events for the purpose of networking will put myself at a great advantage for when I have completed my degree and begin to enter the workforce.

4.0 References

Adcock, M. (2018, January 12). *It's time to get ready for augmented reality*. Retrieved April 14, 2019, from The Conversation: http://theconversation.com/its-time-to-get-ready-for-augmented-reality-89760

Aleksandrova, M. (2018, April 24). *Augmented Reality in Education: The Hottest EdTech Trend 2018 and How to Apply It to Your Business*. Retrieved May 10, 2019, from Eastern Peak: https://easternpeak.com/blog/augmented-reality-in-education-the-hottest-edtech-trend-2018-and-how-to-apply-it-to-your-business/

Assemblr. (2018, December 11). *The History of Augmented Reality*. Retrieved May 04, 2019, from Assemblr: https://blog.assemblrworld.com/the-history-of-augmented-reality/

Banister, C., & Hertel, A. (2018, May 06). *We love augmented reality, but let's fix things that could become big problems*. Retrieved April 14, 2019, from TechCrunch: https://techcrunch.com/2018/05/06/we-love-augmented-reality-but-lets-fix-things-that-could-become-big-problems/

Department of Industry, I. a. (n.d.). *Understanding emerging technologies*. Retrieved April 02, 2019, from Department of Industry, Innovation and Science: https://www.industry.gov.au/data-and-publications/australias-tech-future/introduction/understanding-emerging-technologies

Flanagan, J. (2018, November 15). *A Brief History of Augmented Reality*. Retrieved May 04, 2019, from Medium: https://medium.com/datadriveninvestor/a-brief-history-of-augmented-reality-b07dcb7b4221

Forrest, C. (2018, October 04). *Infographic: The history of AR and VR, and what the future holds*. Retrieved May 04, 2019, from TechRepublic: https://www.techrepublic.com/article/infographic-the-history-of-ar-and-vr-and-what-the-future-holds/

Gallagher, C. (2018, November 18). *End of year summary of Augmented Reality and Virtual Reality market size predictions*. Retrieved May 04, 2019, from Medium: https://medium.com/vr-first/a-summary-of-augmented-reality-and-virtual-reality-market-size-predictions-4b51ea5e2509

Interaction Design Foundation. (2018, August 21). *Augmented Reality – The Past, The Present and The Future*. Retrieved May 04, 2019, from Interaction Design Foundation: https://www.interaction-design.org/literature/article/augmented-reality-the-past-the-present-and-the-future

Isberto, M. (2018, September 05). *2018 Update: A Timeline and History of Augmented Reality*. Retrieved May 04, 2019, from Colocation America: https://www.colocationamerica.com/blog/history-of-augmented-reality

Islam, A. (2018, December 11). *The Future of Augmented Reality*. Retrieved April 14, 2019, from Medium: https://medium.com/predict/the-future-of-augmented-reality-90143b98f7a3

Javornik, A. (2016, October 04). *The Mainstreaming of Augmented Reality: A Brief History*. Retrieved May 04, 2019, from Harvard Business Review: https://hbr.org/2016/10/the-mainstreaming-of-augmented-reality-a-brief-history

Lindros, K., & Tittel, E. (2018, February 13). *How to Get a Job in Virtual or Augmented Reality*. Retrieved May 04, 2019, from Business News Daily: https://www.businessnewsdaily.com/10588-get-job-in-virtual-augmented-reality.html

Lowry, J. (2015, September 01). *Augmented reality is the future of design*. Retrieved May 04, 2019, from The Next Web: https://thenextweb.com/dd/2015/08/31/augmented-reality-is-the-future-of-design/

Marr, B. (2018, July 30). *9 Powerful Real-World Applications Of Augmented Reality (AR) Today*. Retrieved April 14, 2019, from Forbes: https://www.forbes.com/sites/bernardmarr/2018/07/30/9-powerful-real-world-applications-of-augmented-reality-ar-today/

Oldham, P. (2018, July 03). *5 Best Augmented Reality Use Cases*. Retrieved April 14, 2019, from business.com: https://www.business.com/articles/best-augmented-reality-uses/

Paine, J. (2018, May 30). *10 Real Use Cases for Augmented Reality*. Retrieved April 14, 2019, from Inc.com: https://www.inc.com/james-paine/10-real-use-cases-for-augmented-reality.html

Parsons, J. (2019, April 18). *How has technology changed? The biggest advancements in tech and how they've changed our lives*. Retrieved May 04, 2019, from Mirror: https://www.mirror.co.uk/tech/how-technology-changed-biggest-advancements-12378310

Ratnottar, S. (2019, February 15). *Augmented Reality (AR) Trends: The Past, Present & Future Predictions For 2019*. Retrieved May 04, 2019, from Medium: https://towardsdatascience.com/augmented-reality-ar-trends-the-past-present-future-predictions-for-2019-8e1148345304

Reality Technologies. (2018). *What is Augmented Reality (AR)? Ultimate Guide to Augmented Reality (AR) Technology*. Retrieved April 14, 2019, from Reality Technologies: https://www.realitytechnologies.com/augmented-reality/

Robinson, C. (2010, August 08). *Augmented Reality*. Retrieved April 14, 2019, from http://aboutaugmentedreality.blogspot.com/

Rolle, A. (2018, November 22). *Making digital work real*. Retrieved April 14, 2019, from Medium: https://medium.com/datadriveninvestor/making-digital-work-real-7f5cc4b41fc0

Rouse, M. (2016, February 22). *What is augmented reality (AR)?* Retrieved May 04, 2019, from WhatIs.com: https://whatis.techtarget.com/definition/augmented-reality-AR

Sanchez, J. (n.d.). *Augmented Reality in Healthcare*. Retrieved May 10, 2019, from Plug and Play: https://www.plugandplaytechcenter.com/resources/augmented-reality-healthcare/

Sarvaiya, D. (2019, January 24). *Augmented Reality: Market Potential and Practical Applications*. Retrieved May 04, 2019, from HackerNoon: https://hackernoon.com/augmented-reality-market-potential-and-practical-applications-71f0d8faef56

Sawers, P. (2011, July 03). *Augmented reality: The past, present and future*. Retrieved May 04, 2019, from The Next Web: https://thenextweb.com/insider/2011/07/03/augmented-reality-the-past-present-and-future/