**Artificial Intelligence & Data Science (AI&DS)**

**Study abroad module AY2023-24 at Nanyang Technological University Singapore**

**WEEKLY REPORT FOR WEEK 1**

**WEEKLY REPORT**

|  |  |
| --- | --- |
| **STUDENT NAME** | **Praveen Kumar Singh** |
| **PGID** | **24PGAI0068** |

**PART A: Academic course on Blockchain Technologies**

|  |
| --- |
| 1. **Mention 5 key learnings/takeaways from this course – Blockchain Technologies that you learned this week. Please elaborate on these with mention of case studies, examples, references, and concepts covered in class.** |
| The course on Blockchain Technologies has provided several key learnings that are reinforced by the case studies discussed.  Firstly, the course emphasized the **fundamental concepts of blockchain technology**, including its decentralized nature, the use of cryptographic techniques for security, and the concept of distributed ledgers. The Deutsche Bank case study exemplified these concepts, as the bank leveraged blockchain to create an efficient, secure, and transparent system for managing transactions. This case study highlighted the potential of blockchain as a disruptive platform, capable of transforming traditional banking systems.  Secondly, the course highlighted the **potential applications of blockchain across various industries**. The Walmart case study served as a prime example of this, demonstrating how blockchain can enhance supply chain transparency and safety. Walmart’s successful implementation of blockchain technology underscored the importance of strategic planning and careful execution in integrating new technologies into complex systems.  Thirdly, the course underscored the **challenges associated with implementing blockchain technology**. Both case studies provided insights into these challenges, from the technical complexities involved in developing and maintaining a blockchain network, to the organizational challenges of driving adoption and managing change.  Fourthly, the course introduced the concept of **cryptocurrencies**, including Bitcoin and Ethereum, and their underlying mechanisms. The Deutsche Bank case study provided a practical context for understanding these concepts, as the bank explored the potential of cryptocurrencies and other blockchain-based solutions.  Lastly, the course covered the **design principles for blockchain technology**. These principles were evident in the Walmart case study, where the company had to carefully consider how to design and implement its blockchain solution to ensure supply chain safety and transparency.  In conclusion, the course on Blockchain Technologies has provided a comprehensive understanding of the fundamental concepts, potential applications, challenges, and design principles associated with blockchain technology. The case studies of Deutsche Bank and Walmart further enriched these learnings, providing real-world examples of how blockchain can be leveraged to create value and drive innovation. |
| **2. Take any industry/organization of your choice and explain how you would apply these learnings practically.** |
| **Automotive industry**  [Authenticity: Blockchain can help tackle counterfeiting by identifying the provenance (i.e., proof-of-origin) of a product](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain). [This provides a secure and trusted tracking system from the creation or mining of raw materials all the way to the end user enjoying the finished product](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain).  [Maintainability: Blockchain can help facilitate communication between distributed energy resources like a solar panel, smart meters, or a smart grid](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain). [This technology can also automate energy transactions through smart contracts, making it easier to engage in a transactive energy system](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain).  [Supply Chain Management: Blockchain can increase the visibility, transparency, speed, and accuracy of data shared among suppliers, manufacturers, and customers](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain). [The automated flow of information removes the need for manual entry and consequently human errors, which results in a more efficient system](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain).  [Smart Contracts: Smart contracts are implemented in software and stored on the blockchain](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain)[3](https://www.netsuite.com/portal/resource/articles/inventory-management/blockchain-in-manufacturing.shtml). They execute automatically when specific rules or conditions are met. [For example, a smart contract might trigger payment by a manufacturer to a component supplier once delivery has been verified](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain).  [Tokenization & Digital Twin: A digital twin is an exact virtual representation of a physical asset, system, or process to synchronize data for the monitoring, simulation, and prediction of performance](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain). [The combination of blockchain and digital twins can refine the concepts of both technologies and reform supply chain management to advance into Industry](https://www.foley.com/en/insights/publications/2021/10/preventing-counterfeit-product-with-blockchain).  [Energy Efficiency: Blockchain technology can help provide consumers with greater control and efficiency over their energy resources](https://www.forbes.com/sites/forbestechcouncil/2023/07/18/the-blockchain-disruption-transforming-the-energy-industry-with-transparency-efficiency-and-decentralization/). [Instead of relying on applications from energy companies, consumers can use their blockchain platform to manage their energy usage and resources](https://www.forbes.com/sites/forbestechcouncil/2023/07/18/the-blockchain-disruption-transforming-the-energy-industry-with-transparency-efficiency-and-decentralization/).  [Warranty & Recall Management: Blockchain enables manufacturers to trace the full lineage of a product, from unique serial number back to the origin and authenticity of components, helping to avoid counterfeit parts and enable targeted recall responses in seconds, not days8](https://www.pwc.com/us/en/industries/industrial-products/library/blockchain-industrial-manufacturing.html).  [Waste (Recycle) Management (Green Product claims): Blockchain can help revolutionize the waste supply chain by providing a view of the waste supply chain that is accessible and visible](https://www.ibm.com/blog/revolutionizing-the-waste-supply-chain-blockchain-for-social-good/). [Blockchain adds value to both the consumer and the company by demonstrating individual impact to every member of the network](https://www.ibm.com/blog/revolutionizing-the-waste-supply-chain-blockchain-for-social-good/).  In summary, blockchain technology can significantly enhance the efficiency, transparency, and security of various processes in the automotive industry, from the supply chain to waste management. |

**PART B: INDUSTRIAL VISIT (PALO IT SG)**

|  |
| --- |
| **Write your observations and learnings from this industrial visit. What role does this company, and this sector plays in the economy of Singapore?** |
| [The industrial visit to Palo IT, a global innovation consultancy and Agile software development company](https://ideascale.com/blog/what-is-continuous-innovation/), was an enlightening experience. [The company is dedicated to helping organizations in Singapore and across the world embrace tech as a force for good](https://ideascale.com/blog/what-is-continuous-innovation/). [With a vision to harness the power of technology for the greater good, Palo IT has built a community of innovators, designers, and technologists](https://ideascale.com/blog/what-is-continuous-innovation/).  One key observation from the visit was Palo IT’s commitment to Agile methodologies. This approach allows the company to deliver high-quality software solutions that meet the evolving needs of their clients. [The company’s focus on innovation and technology as a force for good was also evident, aligning with the broader trend in the IT sector towards ethical and sustainable tech solutions](https://ideascale.com/blog/what-is-continuous-innovation/).  The IT sector plays a significant role in Singapore’s economy. [Singapore is one of the most wired countries and technologically advanced Information and Communications Technology (ICT) markets in the world](https://ideascale.com/blog/what-is-continuous-innovation/). [The government views ICT investments as a source of economic and social development and aims to be a Smart Nation](https://ideascale.com/blog/what-is-continuous-innovation/). [The city-state is home to many global technology firms, including Google, IBM, Meta, Amazon Web Services, and others, offering digital platforms and services that are key to the digital transformation of companies locally](https://ideascale.com/blog/what-is-continuous-innovation/).  Palo IT, as part of this sector, contributes to the economy by providing innovative software solutions and consultancy services. [By helping organizations embrace technology, Palo IT supports the digital transformation of businesses, thereby contributing to the growth and competitiveness of the Singaporean economy](https://ideascale.com/blog/what-is-continuous-innovation/).  In conclusion, the industrial visit to Palo IT provided valuable insights into the workings of a leading IT company and highlighted the significant role of the IT sector in Singapore’s economy. [The experience underscored the importance of innovation, agility, and a commitment to using technology as a force for good in today’s digital age](https://ideascale.com/blog/what-is-continuous-innovation/). |

**PART C: Industry & Academic Conclave**

|  |
| --- |
| **Write your observations and learnings from this conclave.** |
| I found the Convergence 2023 conclave to be an enlightening and enriching experience. Here are my observations and learnings:   1. **Interdisciplinary Learning**: The conclave emphasized the importance of an interdisciplinary approach, highlighting the convergence of AI, Marketing, and Sports Management. This resonated with me as it aligns with the comprehensive curriculum of our course that integrates various disciplines. 2. **Significance of AI and Data Science**: The panelists underscored the transformative role of AI and data science across industries. Dr. Yonggang Wen’s concept of “AI Wears PRADA” and his insights on the ABCDs of the modern world were particularly impactful. These discussions reinforced my understanding of the course content and its real-world applications. 3. **Career Guidance**: The panellists also shared valuable advice for aspiring professionals in AI and data science. Their emphasis on skills like computational thinking, agility, and professionalism provided a clear direction for my career development. 4. **Networking Opportunities**: The networking session and dinner offered a platform to interact with industry professionals and academia. These interactions broadened my perspective and opened potential avenues for future collaboration and engagement. 5. **Continuous Learning**: The closing address by Dr. Dipak Jain highlighted the importance of continuous learning and adaptability in today’s rapidly evolving world. This reinforced my belief in the value of lifelong learning and the need to stay updated with the latest trends and developments in the industry.   Overall, the Convergence 2023 conclave was not just an event, but a learning experience that complemented my academic journey at Jio Institute. It has inspired me to leverage the knowledge gained from my course in AI and Data Science to contribute to various industries and to the advancement of society. I look forward to applying these learnings in my future endeavours. |