Applicability of Artificial Intelligence and Artificial Consciousness in Papua New Guinea

Alak Kumar Patra[1*] and Arun Kumar Singh[2]

[1]School of Civil Engineering, PNG University of Technology, Lae, Papua New Guinea, ORCID Id: 0000-0002-7375-3009, e-mail Id: alak.patra@pnguot.ac.pg, alakpatra19@gmail.com

[2]School of MCS, PNG University of Technology, Lae, Papua New Guinea, ORCID Id: 0000-0002-9974-4696, E-mail: arun.singh@pnguot.ac.pg, arunsinghiiita@gmail.com

***Corresponding author**

Received: 29 June 2024 | Accepted: 30 August, 2024

Abstract

This paper presents an overview of the use of Artificial Intelligence (AI) along with artificial consciousness (AC) in the context of Papua New Guinea (PNG). The conclusion has been derived through theoretical method. The qualitative study followed dialectical inquiry on the application of artificial intelligence, natural intelligence (NI), Strong intelligence (SI), artificial consciousness, and finally the application of AI and AC in the context of PNG. The applicability of AI and AC in PNG concerning state-of-the-art, contemporary as well as futuristic has been presented based on feasibility. Depending on feasibility, this article makes the relevant comparison of PNG as a country or nations among some other few in terms of the research, development, and application. There are currently limited investigations into the use of AI, and we are uncertain about a holistic study of its applicability with AC in PNG. The study aimed to address that issue. This paper presents future trends with risks and problems of successful superintelligence with artificial consciousness.

Keywords: *Artificial Consciousness, natural consciousness, super intelligence, emerging trends, technical singularity.*

1. Introduction

Artificial Intelligence (AI) is a human-like intelligence built into machines through programming. It's an attempt to program NI into computers with minimal success. At the present state of knowledge, there is no unanimous definition of natural intelligence. Though scientists and engineers are striving to improve synthetic brains and AI is used in various field of applications, it has its pros and cons. The idea of artificial consciousness (AC) is put by businesses to program all-natural awareness of humans into computers. In robotics, the brilliance of humanoid robots with efficient synthetic brains, is called SI. Successful MAN can become something like GOD which is far more intellectually skilled than natural man but also may extinct by kill-switch of SI due to mistake. The function is super, but it received many barriers and challenges in its development to be forced against large profits as eradication of the disease. poverty, floods, or

global warming. The threat to the very existence of the human race, etched with AC, AI has walked long from a wider picture in the National life of PNG as we have seen in most underdeveloped nations. The manuscript illustrates the potential application of AI and AC in PNG. Artificial intelligence and artificial consciousness will change the way we live, and develop digitality in Papua New Guinea (PNG). For Papua New Guinea (PNG) artificial intelligence (AI) has huge promise in several domains. Given the unique challenges and opportunities of PNG, AI adoption is considered appropriate across various sectors such as health care, education sector, agriculture, urban planning, disaster management, economic development, environmental management, governance, and public services. In AI research, artificial consciousness (AC) is a field of study aiming to simulate conscious behaviors in this type of non-biological machine. While a full artificial consciousness by definition, is yet to be realized on the ground; discussion of hypothetical applications in PNG may provide necessary foresight into long-term impacts as well as the means to prepare for potential outcomes later down the line. Artificial consciousness is a controversial subtopic of artificial general intelligence, and as such its study addresses the ethical considerations and philosophy behind creating conscious machines along with opportunities for synergy within applications such as augmented man-machine interfaces in human spaceflight and remote extreme environments. In addition, also areas such as workforce transformation, societal dynamics, enabling skills development and international collaboration, regulation, future planning & strategic foresight are relevant. The challenges and considerations of both applicability are addressed as well. The applicability of AI is as follows which is been displayed systematically:

2. Healthcare

Artificial intelligence (AI) could help diagnose illnesses (Manne and Kantheti, 2021), a role that is particularly important in areas with limited access to trained medical professionals. Machine learning models might process patient data, or medical imagery to help in the early diagnosis of diseases. This means AI can assist in the implementation of telemedicine platforms, vital for PNG's widely dispersed and rural populace. Patients can be triaged using AI to handle their information or evaluate medical imaging, and conversations between health clinicians could benefit from neural network models when supported through remote consultations (Hellinger et al., 2011). AI-based mobile health applications could enable remote health monitoring and help with the management of chronic conditions. For instance, in the fields of Disease Prediction and Management Environmental data along with patient medical records could be used to solve it. AI can also assist in disease surveillance and predicting outbreaks bringing us closer to dengue fever or malaria help achieved.

3. Education

AI can cater to each student's unique learning style and pace (Chen et al., 2020). This is useful in contexts where educational needs differ greatly. AI could help with literacy, and language acquisition in geographies where one has several regional languages and dialects (Lee, 2021). Artificial Intelligence (AI) holds the promise of being a game-changer as PNG looks to enhance learning opportunities and address issues in its education. Other possible applications for AI in PNG education are expanded upon here.

3.1 Customized Education

The AI-based learning platforms adapt the course content as per the needs of individual students (Pratama, 2023) helping experienced to move ahead and shoring up those who are in need with a little assistance for regions where access to specialized instructional resources is severely lacking, this can be of particular benefit. It will enable AI to evaluate student learning data for identifying patterns in learning, predicting outcomes & advising teachers on more targeted interventions.

3.2 Aid for Teachers

Mechanization of Administrative activities: AI solutions can be utilized by the system to decrease the burden (Fahimirad and Kotamjani, 2018; Liu et al., 2022)) on instructors from administrative acts like grading sheets & Attendance, etc., as they serve as the most productive innovation platform which manages grading and attendance such that teacher will roll out custom instructional methods without an obstacle. AI-powered platforms can deliver tailored training for teachers to develop new skills and access resources best suited to their needs. AI can perform language translation, which in a culturally diversified nation will give resources with reading material translated into regional tongues and dialects. AI tools can help people create quickly and re-purpose educational content, like digital textbooks or interactive learning resources that can be updated to reflect the newest data almost instantly.

3.3 Better learning opportunity

Virtual Classrooms and Interactive Tools: AI also offers better education opportunities through virtual classrooms where students and teachers can interact irrespective of geographical distances, receiving high-standard lessons. AI can build engaging teaching tools such as gamified learning environments, and simulations that foster student interaction.

3.4 Remote and Indigenous Communities

AI chatbots (Mondal et al., 2023) could be very helpful to provide instant assistance as they can respond immediately so that the professor, and students are protected; in distant regions where, human workers have limited access, this assists the better. AI can facilitate changing instructional materials to mirror local cultures and situations, thus making learning more helpful and interesting for students in numerous communities. AI can identify students in need of help ahead of before their problems compound. An additional intention of using AI in systems is to gauge the impact it has on policy and program development for education by providing insights into what worked well, and how can we scale up an effective pedagogical approach.

3.5 Challenges and Considerations

AI applications depend on stable internet connectivity, as well as digital hardware available in the underdeveloped or more rural regions of PNG. Proper training should be provided using AI technologies so that both teachers and students are well versed with the technology needed while without proper technical support, successful deployment will not happen.

3.6 Ethical and Cultural Sensitivity

So that the differing needs of PNG's population can be met by AI systems ensuring inclusivity with ethical considerations including AI in education would do well and it could greatly improve learning outcomes as a result along with access to quality education provided for Papua New Guinea. Artificial Intelligence (AI) promises to revolutionize Agriculture by addressing multiple challenges that face farmers and boosting productivity (Eli-Chukwu, 2019) which is true for Papua New Guinea also. The multiple applications of AI in agriculture can be demonstrated in the following few sub-sections:

4 Agricultural uses of AI:

4.1 Precision Agriculture – Crop Health

Fly is a major pest in most crops, the fungus it injects results in diseases that can lead to plant death. The drones loaded with artificial intelligence (AI) and satellite photography monitor crop health by identifying pests & diseases as well as measuring parameters related to soil conditions. This allows for a more targeted use of resources and interventions. This way AI can help farmers to make informed decisions by predicting agricultural product metrics (Linaza et al., 2021) based on weather conditions, soil facets, and historical performances.

4.2 Soil and Water Management

AI can analyze the soil state (Elbeltage et al., 2022) as well, as health and type from sensor data which further helps in fertilization techniques to be adopted, and nutrient levels required. These AI systems can also automatically schedule irrigation, considering the crop's needs along with soil moisture and weather forecasts. This method helps to save a lot of water while improving the yield.

4.3 Pests and Disease Management

AI systems can analyze crop photos to recognize the first signs of pests and illnesses (Li and Wang, 2024). This is significant as it will lead to timely treatment and reduce crop losses. AI will be helping the farmers by using environmental data to predict disease epidemics and pest infestations this type of modeling is also called Predictive Modeling.

4.5 Planning and Management of Farms

AI systems can aid not only inefficient farm management but also leverage the optimal use of available resources including manpower, machinery, and inputs. AI can help in conducting financial analysis, trading price fluctuation, market trends, and production costs.

4.5 Supply chain and market access

This includes everything from pricing to forecasting. AI using market data (Javaid, 2023) to predict future price trends, helping farmers make better decisions on when they should sell their products. AI helps in Supply Chain Optimization. AI in operations has the potential to permutate and optimize a business's supply chain logistics, better warehousing, demand forecasting tools & route optimization.

4.6 Instruction and Information Exchange

AI-powered platforms that educate farmers with real-time guidance on crop management, best practices, and the latest Agri-innovations. AI can deliver educational content to farmers in remote regions, it may help providing this material with the language of that region or format.

4.7 Sustainability and Environment Impact

Artificial intelligence can reduce harm to the environment by optimizing resources like water, fertilizers, or pesticides leading to an increase in sustainable farming practices. Not only this, AI helps in several ways to enhance sustainability and reduce environmental impacts on agricultural products.

4.8 Challenges and Issues

Reliable internet access is needed for AI to be feasibly applied in agriculture, while these can still be scarce in some places of PNG. Smaller farmers may not be able to afford the hefty initial costs of AI tools and technology. Farmers need to be trained fully on how best these AI tools will serve them. The other is that the systems of reinforcement have to be there too for adoption and uptake. When AI systems are collecting or analyzing sensitive data, the issue of safeguarding this information is especially important. Ultimately, Papua New Guinean agriculture has much to gain from artificial intelligence (AI), in productivity and resource-use efficiencies. But that can only happen properly when the infrastructure, costs, and training challenges are solved.

5. Urban planning

Urban planning is an important issue for every nation in the world. Application of artificial intelligence has good prospects (Yigitcanlar et al., 2020; Sanchez et. al, 2023). In Papua New Guinea (PNG), artificial intelligence (AI) is possible to impact urban planning by solving some issues and supporting sustainable growth in fast developing cities. Examples of how AI can be used (in the urban planning context in PNG):

5.1 Urban Infrastructure Development

Using data from sources as varied as traffic patterns, population growth, or infrastructure consumption, Intelligent Transportation Systems (AI) can plan and build smart cities (Mcmillan and Varga, 2022; Agarwal et al., 2015). This is done by optimizing the location of roads, utilities, and public buildings. Predictive analytics and AI-based sensors can monitor the condition of infrastructure like roads, and bridges to predict when repairs are needed leading to reduced breakdowns.

5.2 Traffic Control

Appropriate utilization of AI can be seen in various areas like real-time data analysis and optimization, eliminating congestion on the roads, etc. By using AI, public transportation routes and schedules can be optimized according to passenger data analytics and usage trends leading to increased service reliability, accessibility as well as efficiency.

5.3 Environmental Surveillance

Artificial Intelligence can measure and monitor air quality data to pinpoint pollution hotspots as well as to predict possible trends in air quality. This provides the data upon which policies to improve air quality in our cities can be developed. The data collected from sensors inside waste bins can be analyzed with AI to optimize routes and collection times, making an overall more efficient waste management system.

5.4. Land Use and Zoning

Analyze satellite imagery and land use data with AI to inform zoning choices, determine optimum locations for development projects, as well as balance urban expansion against conservation. Estate analysis, property values and real-estate trends are some of the multimodal machine-learning AI assets that can influence decisions related to planning or investment-making.

5.5 Disaster Preparedness and Response

AI can be used to analyze for example data about natural hazards (e.g. floods, earthquakes) and assess risks/vulnerabilities in urban areas supporting disaster preparedness/planning. AI can aid in effective and swift emergency response efforts by processing real-time data and formulating speedy conclusions based on it that are resource-efficient concerning disasters.

5.6 Participation and Engagement in the Community

AI can examine public feedback via surveys and social media posts to gain a broader understanding of community needs and preferences, allowing us to design our cities in more responsive ways. Virtual Simulations will enable stakeholders and citizens to see and give feedback on planning projects through simulated city models produced by AI-driven simulations.

5.7 Sustainable development

Artificial intelligence can be effectively used for sustainable urban planning and management of carbon emissions (Pan et al., 2022). AI can regulate the amount of energy being used for their cities and buildings, which helps them to minimize their consumption to follow sustainability targets as well as save from limiting their extravagance value. AI will be able to model how climate change affects cities and provide adaptation plans that are low risk for enterprises but also high resilience.

5.8 Challenges and Considerations

AI applications cannot work correctly when they are not running over comprehensive data that is of high quality. Data availability and collection may prove to be a challenge in PNG, especially in the rural/inland/most underdeveloped reaches. Infrastructure and Technology requires solid technology infrastructure for the implementation of AI solutions, which may not be present in some of the PNG locations. This backbone is made up of reliable connectivity (Internet) and disk space for housing data. Municipal government representatives and urban planners need help to apply AI technologies for analysis & processing as well. AI solutions need to be culturally specific for their deployment to have any impact on society. In hindsight, through the promotion of

productivity and sustainability as well as responsiveness, artificial intelligence (AI) can have a pervasive impact on enhancing urban planning in Papua New Guinea. However, for its implementation to work all concerned departments and systems need to address many underlying questions which pertain to data, infrastructure as well as capacity building.

6. Disaster Management

AI is widely used for disaster management (Sun et al., 2020). According to a news release by the United Nations Development Program, Artificial Intelligence (AI) can make disaster management in the vulnerable country of Papua New Guinea more efficient. In this respect, here is how PNG can leverage AI to strengthen disaster management:

6.1 Systems of Advanced Early Warning Signal-based Predictive Analytics

Based on the analysis of historical data and real-time input from sensors, AI systems can predict natural disasters such as floods, earthquakes cyclones, and man-made disasters. In Papua New Guinea AI can be used for man-made disaster predicting intelligence (Maharani et al., 2023) and monitoring separatist and terrorist movements. This has the potential to be an early warning letting those communities know they need to prepare and evacuate if necessary and to generate localized weather forecasts from weather patterns images and data better than any human.

6.2 Real-time sensor network monitoring

By using ambient data from a network of sensors (flood water level sensor, earthquake seismic sensor) artificial intelligence can continuously monitor the environmental conditions in real-time and detect anomalies that may indicate an imminent natural disaster (Kumne & Samanta, 2023). CapAnalysis uses artificial intelligence (AI)-enabled image recognition that can analyze aerial and satellite imagery to monitor changes in land use, detect signs of volcanic activity, and assess not only during but also after disasters have occurred a variation on disaster situation.

6.3 Disaster Response and Relief Resource Distribution

AI becomes so handy as it can save lives by helping distribute emergency resources (Aboualola et al., 2023) to where they are exactly needed (medicine, army…), by making sense of data in near-real time, making informed decisions based on prediction models, etc. AI ensures faster and more planned intervention by managing the logistics & communication all this will coordinate its other response from different agencies/organisations working for disaster management.

6.4 Perception

The inspection of structural damages involves various factors including detection of potential damage, with the creation and understanding of indicators to detect a change or trace in the damaged area. AI evaluates photos taken by satellites and drones to measure damage to buildings (Worden and Manson, 2007), roads, and infrastructure. Much of this info is often real-time suitable orderly disaster response. AI systems can determine the consequences of disasters on infrastructure and communities, helping prioritize actions in areas that urgently need assistance.

6.5 Planning and Risk Mitigation

AI analyses historical disaster data, geological surveys, and environmental characteristics to generate holistic hazard maps. This information can inform building codes and land-use planning, as well as help in identifying areas at the highest risk. AI could measure a nearby population or area's vulnerability to numerous disasters which would then be useful for crafting targeted preparedness and mitigation plans.

6.6 Awareness of Community and Involvement

By chatbots or mobile apps, through social media platforms - AI can enhance public communication by providing personalized and helpful disaster risk information/ preparedness strategies/evacuation routes. AI-powered tools and platforms can deliver educational content required for pre-disaster planning, as well as training simulations that guide communities in developing the capacity to prevent or be ready with an effective response.

6.7 Challenges and Considerations

High-quality data is crucial for successful AI applications. Fieldwork is quite difficult in PNG, especially in remote and underdeveloped areas. AI technology adoption requires reliable infrastructures. That data includes the storage and accessibility of the internet which is often only available in PNG hot spots. It is essential to ensure that local authorities, disaster response teams, and communities have the training they need to use AI tools and interpret their results efficiently. AI solutions must be sensitive to, suitable for, and mindful of ethical considerations when designing an interface that uses AI algorithms should take into consideration local customs/needs. Artificial intelligence (AI) can help Manila to strengthen results around early warning systems, real-time monitoring, response coordination, and damage assessment which is essential for building risk-informed decisions at the national level. While these benefits are possible to deliver, some of the issues still linger around for data-related scripts and much work is in progress on infrastructure (data movement with minimum lag) as well as capacity creation.

7. Economic Development

One sector of immense potential is the use of Artificial Intelligence (AI) in Papua New Guinea (PNG), which can remove various economic barriers, increase productivity and encourage innovation. AI can help in PNGs economic development as here is how:

7.1 Market Analysis

AI can help local companies and entrepreneurs and dig deeper into consumer demands by observing their behavior as well as market trends (Verma et al., 2021; Rahmani et al., 2023). AI should enrich tourist services and provide personal suggestions to make the journey even more enjoyable.

7.2 Rural development and agriculture

Boosting Agricultural Productivity - AI can look at data collected via sensors and drones to optimize planting, irrigation, or harvesting. Farmers could reduce costs and increase yields by doing this. Artificial intelligence (AI) can help to boost the efficiency of agricultural supply chains, allow farmers in rural areas more access to markets as well as enable better forecasting of demand and optimization routing.

7.3 conservation of natural resources

To improve safety and minimize environmental impact, as well as increase resource extraction efficiency can benefit from a new tool available in the post-apocalyptic era including artificial intelligence (AI) algorithms (Jones et al., 2024) that evaluate geological data, and automate processes. Artificial Intelligence (AI) can provide insights into sustainable practices while flagging illegal activities and aiding in the management and monitoring of vital natural resources like fisheries or forests.

7.4 Evolution of the Infrastructure

Using data about urban development, city planners can bolster the planning and creation of infrastructures of an "urban environment" by determining through artificial intelligence (Wu et al., 2022) where their populations including automobiles operating on human-movable-object-transporters to residential systems will grow; how burgeoning trends in traffic flow are anticipated or predicted. This leads to even more sustainable and efficient cities. AI could reduce costs and enhance maintenance by monitoring infrastructure including the utilities, roads & bridges, and democratizing mobility which is a decongestion ask in most major cities around the globe.

7.5 Education and Health Care

AI can be a great resource for healthcare and education (Dave and Patel, 2023). Healthcare issues which can be handled by AI well are diagnosis, treatment matches, and distribution in health services. These are all factors that can create a healthier and more productive workforce and improve learning outcomes, tailor unique learning experiences, foster capability development create a world of workforce with more skills.

7.6 Inclusion and Access to Financial Services

To improve financial services, AI can assist by way of personalized banking, credit scoring, and fraud detection (Mahlanga, 2020; Kshetri, 2021). This could lead to better financial inclusion and more flexibility for people and businesses in accessing the finance they need. AI can use economic data as its input to forecast future trends, and make important decisions about public policy and strategic planning of an economy.

7.7 Travel/Culture Configuration

AI can revolutionize tourism by analyzing tourist data and optimizing marketing strategies, recommending the best destinations for you (Kulesz, 2018). It would also attract more tourists to develop the travel and tourism industry. AI can be used to digitize historical artifacts, analyze and

understand cultural shifts, and create virtual travel/training experiences that preserve cultural heritage.

7.8 Startups and Small Industries of Innovation and Entrepreneurship

The customer insights, business analytics, and market research it provides are important resources for entrepreneurs (Obschonka and Audretsch, 2020). This will help startups and small businesses to grow easily & stay ahead of the competition. AI can help in research and development, finding patterns across a lot of industries which further develops a culture for innovation.

7.9 Problems to Solve and Consider

AI model needs strong data and high-tech underlying technology support. PNG needs to have a reliable and strong internet connection, accessible data storage for this AI-based; and methods of gathering the required back information. without proper skills development in AI and data science through education and training, the operationalization of AI technologies may not be effective or sustainable. Implementing advanced AI technologies to a high degree can be expensive initially. Ensuring that AI solutions are widely available and affordable to many industrial sectors, as well as small businesses in even the most remote spots seems critical. AI should include considerations of how to ensure that development is inclusive and fair, what types of socio-economic consequences are possible (e.g. unemployment issues or the absence of privacy) as well as ethical implications. AI has the potential to greatly enhance productivity, and improve services and innovation in many sectors/areas which could drive economic growth up significantly for Papua New Guinea. This will involve addressing challenges with infrastructure, data, and talent development to help maximize the benefits of AI while ensuring that its applications positively contribute towards the economic growth of the nation

8 Artificial consciousness

But as speculative and abstract as artificial consciousness remains to this day, its development carries with it profound future implications. Before any of these state-of-the-art systems are put in place you need to consider the practicality and ethics. This is followed by a study on the potential relevance of this concept.

8.1 Philosophical and Ethical Issues

Papua New Guinea is rich in cultural diversity, and there are many to consider when dealing with things such as personality or the nature of consciousness. Adopting artificial consciousness would require significant deliberation on local values and beliefs (Chrisley, 2008; Hildt, 2023). This means that community input would be required to answer ethical questions and ensure cultural compliance with the technology.

8.2 Ethical Frameworks

These clearly would need agreed-upon standards and frameworks before using AI or dealing with it anyway. Those guidelines could prevent misuse and mitigate the unintended social consequences of using such technology.

8.3 Potential Applications

This could lead an artifice to be able to interact with humans in a much more intuitive way similarly to humans and without prejudice (Porcor and Perito, 2016). This might even yield kinder and more effective responses in sectors like customer service, healthcare, or education. Should they reach a point where we can understand and respond to human emotions in their myriad forms, then potentially more advanced support for remote communities would be possible. Such support would certainly be more personalized and context-specific.

8.4 Social Structures and Changes in the Employment Workforce

The introduction of advanced artificial consciousness could have significant effects on employment, opening the door to automating jobs that require high-level decision-making or emotional intelligence (Makarius et al., 2020). The workers in this scenario would need retraining and adaption techniques. The collective consciousness and human societal dynamics around them can become affected by the existence of mindful machines. Surely equipping ourselves with the knowledge as to how these technologies affect society and human relations is required if they were ever come into place.

8.5 Opportunities for Research and Education

PNG might have a future in new tech advances and discovery in both subjects of intricate AI (Artificial Intelligence) as well the field consciousness, through investment in education and study (McDermott, 2007). To understand and adapt this technology back home, local knowledge would be crucial. Participating in research and collaboration could allow PNG to gain access to frameworks used globally including lessons on how advanced AI principles are integrated or crudely pasted into for the rise of their demographic forwards, with local implications being factored.

8.6 Regulation and Policy Development

Regulations, no matter how radical the approach might be to implement it within its constraints or what limitations would you place so that artificial consciousness is not something malevolent and lead society toward destruction (de Almeida et al., 2021; Meissner, 2020; Oleksiewicz and Civelek, 2019). It may be useful to foster public dialogues about artificial consciousness to create some legislation that foresees those problems while at the same time reflecting on societal values.

8.7 Forward-Looking Events and Strategic Scheduling

PNG needs to prepare itself for any possible future eventuality concerning artificial awareness, as bad as it is anticipated. This involves a strong evaluation of advantages, disadvantages, and impact on society. PNG will be in a better position, in a new technology-equipped manner, if it prepares wisely for AI research and technological infrastructure. These outlays could also pave the way for future growth. Though full artificial consciousness remains a theoretical concept, it has broad and possibly significant potential. Realizing this requires PNG to accept a culturally responsive curriculum, long-term strategic planning, and investment in education all together with an ethical interest. Preparing for the eventual arrival of these new technologies, by looking into ways to

understand and counteract their potential impact on the economy, society, and culture. By learning from these factors PNG can be better planned to manage the associated benefits and challenges that may arise through advancements in artificial consciousness.

9. Challenges and Scenarios

The AI solutions cannot work without sufficient digital infrastructure. It could be hard for places with limited technology or connectivity. For solutions to even be successful, they must adapt in concrete terms that "tune" local into culture/cultural capital as used here, social and economic specificities of practice everywhere. Along with AI technology awareness, it is very much essential to have training in the whereabouts of development and application for different AI technologies (Zacharias, 2019). To make sure that as advances in the development of AI are used to the benefit of local populations, developers need to be aware of cultural values & ethical considerations which can have adverse impacts while implementing them.

10. Conclusion

In summary, whilst AI has the potential to be a game changer for PNG's development there is a need for cautious planning and consideration of how these challenges are addressed so that any benefits accrued would be shared equitably. AI can be rolled out in various fields such as health, education, and agriculture to urban planning or disaster management areas of PNG for better social status even at the national level. Artificial consciousness, however, is a more theoretical concept that could potentially raise some serious ethical issues with lasting implications — unlike AI which has immediate and practical use cases for many PNG industries, ensuring that you get the biggest bang from AI while keeping its demons away is by maintaining regional needs and values tied up to technologies. Due to the fourth industrial revolution era through which the world is going now, we developed the concept of artificial consciousness. Artificial consciousness is a heavily dogged issue in its development. It's very early and we are incredibly excited; the overlap with robotics, made possible by advances in synthetic biology is pretty sweet like a religious icon framing an atomic weapon. After the AC is applied, there will be no more poverty, diseases, or hazards by environmental pollution and/or global warming. While on the flip side, weaponized super AI may destroy humanity entirely from the earth. It is the kind of news that would lead one of contemporary mankind’s most eminent scientists to warn that AC could be the final achievement of the human race. This could be a technological singularity. It can provide the rest of the world with magical benefits if controlled and used properly, whereas if mis-utilized, it may pose an existential threat to humankind throughout the world.

References

1. Aboualola, M., Abualsaud, K., Khattab, T., Zorba, N., & Hassanein, H. S. (2023). Edge technologies for disaster management: A survey of social media and artificial intelligence integration. *IEEE Access*.

2. Agarwal, P. K., Gurjar, J., Agarwal, A. K., & Birla, R. (2015). Application of artificial intelligence for development of intelligent transport system in smart cities. *Journal of Traffic and Transportation Engineering*, *1*(1), 20-30.
3. Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.
4. Chrisley, R. (2008). Philosophical foundations of artificial consciousness. *Artificial intelligence in Medicine*, *44*(2), 119-137.
5. Dave, M., & Patel, N. (2023). Artificial intelligence in healthcare and education. *British dental journal*, *234*(10), 761-764.
6. de Almeida, P. G. R., dos Santos, C. D., & Farias, J. S. (2021). Artificial intelligence regulation: a framework for governance. *Ethics and Information Technology*, *23*(3), 505-525.
7. Eli-Chukwu, N. C. (2019). Applications of artificial intelligence in agriculture: A review. *Engineering, Technology & Applied Science Research*, *9*(4).
8. Fahimirad, M., & Kotamjani, S. S. (2018). A review on application of artificial intelligence in teaching and learning in educational contexts. *International Journal of Learning and Development*, *8*(4), 106-118.
9. Hellinger, A., & Seeger, H. (2011). Cyber-Physical Systems. Driving force for innovation in mobility, health, energy and production. Acatech Position Paper, National Academy of Science and Engineering, 1(2).
10. Hildt, E. (2023). The prospects of artificial consciousness: Ethical dimensions and concerns. *AJOB neuroscience*, *14*(2), 58-71.
11. Javaid, M., Haleem, A., Khan, I. H., & Suman, R. (2023). Understanding the potential applications of Artificial Intelligence in Agriculture Sector. *Advanced Agrochem*, *2*(1), 15-30.
12. Kshetri, N. (2021). The role of artificial intelligence in promoting financial inclusion in developing countries. *Journal of Global Information Technology Management*, *24*(1), 1-6.
13. Kulesz, O. (2018). Culture, platforms and machines: the impact of artificial intelligence on the diversity of cultural expressions. *Intergovernmental committee for the protection and promotion of the diversity of cultural expressions*, *12*.
14. Kumne, W., & Samanta, S. (2023). Geospatial Mapping of Inland Flood Susceptibility Based on Multi-Criteria Analysis–A Case Study in the Final Flow of Busu River Basin, Papua New Guinea. *International Journal of Geoinformatics*, *19*(6), 31-48.
15. Lee, A. (2021). The Effect of ARTIFICIAL INTELLIGENCE Literacy Education on University Students' Ethical Consciousness of Artificial Intelligence. *Robotics & AI Ethics*, *6*(3), 52-61.
16. Li, C., & Wang, M. (2024). Pest and disease management in agricultural production with artificial intelligence: Innovative applications and development trends. *Advances in Resources Research*, *4*(3), 381-401.
17. Linaza, M. T., Posada, J., Bund, J., Eisert, P., Quartulli, M., Döllner, J., ... & Lucat, L. (2021). Data-driven artificial intelligence applications for sustainable precision agriculture. *Agronomy*, *11*(6), 1227.
18. Liu, Y., Chen, L., & Yao, Z. (2022). The application of artificial intelligence assistant to deep learning in teachers' teaching and students' learning processes. *Frontiers in Psychology*, *13*, 929175.

19. Maharani, T. D., Sarjito, A., Marnani, C. S., Zakky, H., & Almubaroq, R. F. (2023). Separatist and Terrorist Movements in Papua: The Challenges of Social Disaster Management and the Important Role of Human-Made Disaster Intelligence. *Jurnal Pertahanan*, *9*(3), 443-457.
20. Makarius, E. E., Mukherjee, D., Fox, J. D., & Fox, A. K. (2020). Rising with the machines: A sociotechnical framework for bringing artificial intelligence into the organization. *Journal of business research*, *120*, 262-273.
21. Manne, R., & Kantheti, S. C. (2021). Application of artificial intelligence in healthcare: chances and challenges. *Current Journal of Applied Science and Technology*, *40*(6), 78-89.
22. McDermott, D. (2007). Artificial intelligence and consciousness. *The Cambridge handbook of consciousness*, 117-150.
23. Meissner, G. (2020). Artificial intelligence: consciousness and conscience. *AI & SOCIETY*, *35*(1), 225-235.
24. Mhlanga, D. (2020). Industry 4.0 in finance: the impact of artificial intelligence (ai) on digital financial inclusion. *International Journal of Financial Studies*, *8*(3), 45.
25. Mondal, H., Marndi, G., Behera, J. K., & Mondal, S. (2023). ChatGPT for teachers: Practical examples for utilizing artificial intelligence for educational purposes. *Indian Journal of Vascular and Endovascular Surgery*.
26. Obschonka, M., & Audretsch, D. B. (2020). Artificial intelligence and big data in entrepreneurship: a new era has begun. *Small Business Economics*, *55*, 529-539.
27. Oleksiewicz, I., & Civelek, M. E. (2019). From Artificial Intelligence To Artificial Consciousness: Possible Legal Bases For The Human-Robot Relatıonships In The Future.
28. Pan, H. Z., Shi, R., & Yang, T. R. (2022). Applications of artificial intelligence in urban planning and governance for carbon peak and carbon neutrality. *Urban Planning International*.
29. Porcor, M. Perito, J., Nature Versus Design Synthetic Biology or How to Build A Biological Non-Machine. Integrative Biology (Royal Society of Chemistry), 2016, Vol.8, pp.451-455.
30. Pratama, M. P., Sampelolo, R., & Lura, H. (2023). Revolutionizing education: harnessing the power of artificial intelligence for personalized learning. *Klasikal: Journal of education, language teaching and science*, *5*(2), 350-357.
31. Rahmani, A. M., Rezazadeh, B., Haghparast, M., Chang, W. C., & Ting, S. G. (2023). Applications of artificial intelligence in the economy, including applications in stock trading, market analysis, and risk management. *IEEE Access*.
32. Sanchez, T. W., Shumway, H., Gordner, T., & Lim, T. (2023). The prospects of artificial intelligence in urban planning. *International Journal of Urban Sciences*, *27*(2), 179-194.
33. Sun, W., Bocchini, P., & Davison, B. D. (2020). Applications of artificial intelligence for disaster management. *Natural Hazards*, *103*(3), 2631-2689.
34. Verma, S., Sharma, R., Deb, S., & Maitra, D. (2021). Artificial intelligence in marketing: Systematic review and future research direction. *International Journal of Information Management Data Insights*, *1*(1), 100002.
35. Worden, K., & Manson, G. (2007). The application of machine learning to structural health monitoring. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *365*(1851), 515-537.

36. Wu, J., Wang, X., Dang, Y., & Lv, Z. (2022). Digital twins and artificial intelligence in transportation infrastructure: Classification, application, and future research directions. *Computers and Electrical Engineering*, *101*, 107983.
37. Yigitcanlar, T., Kankanamge, N., Regona, M., Ruiz Maldonado, A., Rowan, B., Ryu, A., ... & Li, R. Y. M. (2020). Artificial intelligence technologies and related urban planning and development concepts: How are they perceived and utilized in Australia? *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4), 187.
38. Zacharias, G. L. (2019). *Autonomous horizons: the way forward* (p. xxii). Maxwell Air Force Base, AL: Air University Press.

Author's Bibliography

Alak Kumar Patra earned his B.E. in Civil Engineering from Jadavpur University, Kolkata in 1999, M.E. in Structural Engineering from IIEST Shibpur in 2012, and Ph.D in Structural Engineering from IIT Kharagpur in 2018. He is currently working as Deputy Head, PG Course Coordinator and Chairman of Research Development and Engagement Committee, in the School of Civil Engineering (SCE), The Papua New Guinea University of Technology since 2022. He has published more than 40 research articles in reputed journals, conference proceedings and books with 148 citations. His primary research works are focused on advanced composites, mechanics, applications AI, sustainability and AIoT. He is a life time fellow member (F.I.E) of The Institute of Engineer (India). He has more than 30 years' experience in teaching, research and industries.

Arun Kumar Singh currently working as Head of Computer Science in School of Mathematics and Computer Science, PNG University of Technology, Lae, Papua New Guinea. He received B. E. degree in ECE from Agra University, Agra, M. Tech. Degree in IT-WCC from IIIT-Allahabad, Prayagraj, India and PhD degree from SU Meerut, India. He has published more than 50 research papers in reputed international journals and conferences including IEEE and it's also available online. His main research work focuses on Cybersecurity, AI, Sustainability, IoT and Computational Intelligence. He has 20 years of teaching experience and 15 years of research experience.