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RISE

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ABOUT THE MAGAZINE

RISE Magazine is published by Office of the Deputy Vice-Chancellor (Research and Innovation) with aims to highlight a research and innovation on multidisciplinary expert of fields in UiTM. It serves as a platform for researcher to showcase their high quality and impactful findings, activities and innovative solution through publication. Contribution of these ideas come from academicians, researchers, graduates and universities professionals who will enhance the visibility of research and stride to elevate Universiti Teknologi MARA to global standards. This is an effort to promote research as a culture that is accepted by all expertise.

ABOUT UiTM

Universiti Teknologi MARA (UiTM) is a public university based primarily in Shah Alam, Malaysia. It has grown into the largest institution of higher education in Malaysia as measured by physical infrastructure, faculty and staff, and student enrollment. UiTM is the largest public university in Malaysia with numerous campuses throughout all 13 states in Malaysia. There is a mixture of research, coursework and programmes offered to the students. The Office of the Deputy Vice-Chancellor (Research and Innovation) also known as PTNCPI *(Pejabat Timbalan Naib Canselor (Penyelidikan dan Inovasi))* serves as a *Pusat Tanggungjawab* (PTJ) for navigating the research and innovation agenda of the university to achieve UiTM's goals.The PTNCPI office strives to mobilize faculty and campuses, fostering collaboration among researchers, with the aim of transforming the University into a Globally Renowned University by 2025

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Malaysia AI application in Trucking Industry Robot Rules the Road?

Introduction

In this brave new world of trucking, humans, machines, and AI set out on an adventure that will undoubtedly change the face of the business. The trucking industry in Malaysia is at a crossroads between innovation and automation, as the country embraces artificial intelligence technology. Here, we'll take you on a tour of the highs and lows of artificial intelligence in Malaysia's trucking sector.

AI Trucking Industry Global Domination

Before that, let's have a look on a bigger picture of how AI in trucking industry is at the global stage. One of the notable advancements is introduced by Daimler with their Autonomous Freightliner. Imagine a truck driving down the highway while the driver takes a much-needed nap, thanks to the AI-powered system. The Freightliner Inspiration Truck from Daimler demonstrated the potential of autonomous vehicles. Although it seems like something out of science fiction, we have to wonder if the "autonomous" driver is just another weary trucker in need of a break (Samala et al., 2020).

The T-Pod is Einride's autonomous electric truck of the future. It's easy to get swept up in the robot revolution with its slick design and promises of efficient, driverless operations. We can't help but imagine a future where every road is clogged with T-Pods communicating via binary honks or deep existential debates (Caban et al., 2022).

It appears that the "Logistics Black Box" system used by Alibaba contains a wealth of information (Kitzler & Saibel, 2020). It seems to know everything about us, as it gathers data from all over the world to improve logistics processes. Will it begin making suggestions for cargo based on our browsing history, or even worse, become an AI matchmaker for lonesome shipments looking for love?

TuSimple's Autonomous Freight Network uses AI-enhanced trucks for intercity transport. Even though it saves time and money, we can't help but imagine a future where trucks perform a choreographed dance routine on the roads, fascinating drivers and spawning a whole new industry called "Truck Ballet." (tuSimple, 2022).

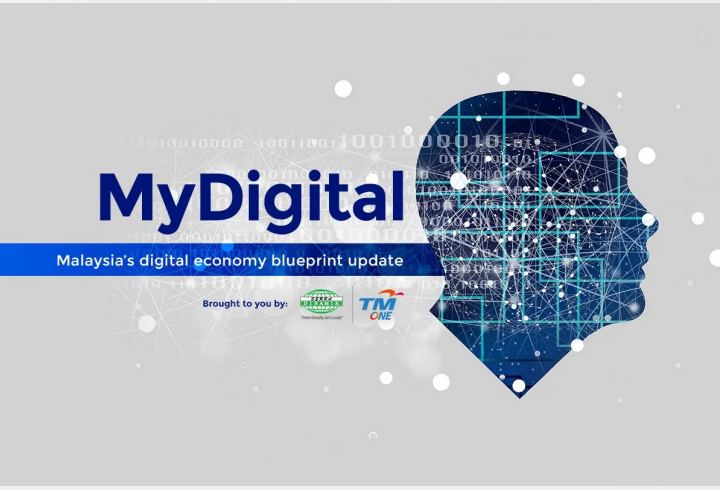
Images of supernatural beings with mind-reading abilities come to mind when we talk about Scania's Fleet Management System. It is an AI-driven system that monitors fleet performance in real time. We wonder if it has the ability to foresee drivers' needs for quick food stops or to teleport maintenance wizards to fix any car problems instantly (Katreddi et al., 2022).

The Malaysia AI Background and AI In Malaysia Trucking Industry

Let's now delve further in Malaysia context. Several government programmes in Malaysia aim to hasten the spread of AI. Malaysia's National Policy on Industry 4.0 is one such example. It acts as a spur to innovation, helping to make the country a major player in the digital economy on a global scale. This policy's emphasis on AI is intended to spur innovation in previously unrelated fields, as well as modernise established ones (Iyer, 2021). By putting AI to good use, Malaysia can quickly enter the age of smart manufacturing and automated procedures, among other benefits. Next, we have MyDIGITAL Blueprint, which is a strategic plan for Malaysia's digital economy that highlights the country's dedication to encouraging innovation and welcoming new forms of technology. This all-encompassing strategy has AI at its centre and aims to put Malaysia at the forefront of the digital world (Economic Planning Unit, 2021).

MyDIGITAL's goal is to spur economic development, support local tech startups, and develop a thriving ecosystem that encourages innovation and collaboration through the promotion of AI adoption. Malaysia has created a thorough National AI Framework after realising the game-changing potential of AI. This long-term plan lays out steps for the safe and equitable implementation of AI systems. The framework prepares Malaysia to use AI in a way that benefits society, business, and the environment by placing a strong emphasis on talent development, R&D collaboration, and ethical considerations (Samsurijan et al., 2023)

The startups and digital companies that call Malaysia's Digital Hub initiative home serve as innovation incubators. These centres foster AI-driven startups by providing access to cutting-edge infrastructure, expert guidance, and useful connections. These online communities help advance artificial intelligence (AI) and foster a thriving startup ecosystem by providing a platform for sharing and gaining insight. In the midst of Malaysia's digital revolution, the



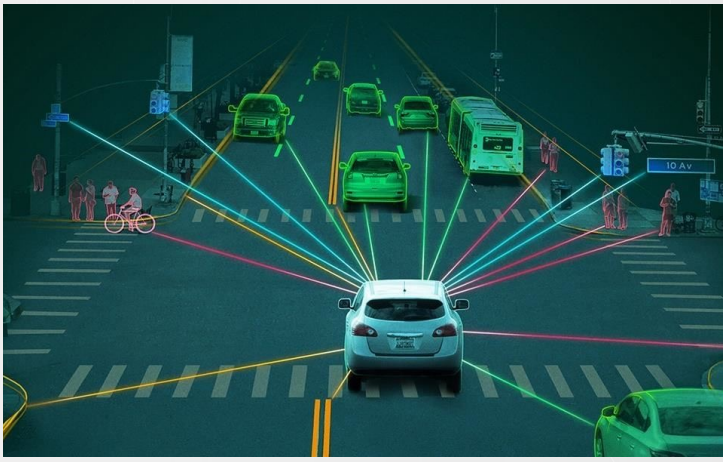
Malaysia Digital Economy Corporation (MDEC) stands as a linchpin (Edrak et al., 2022). This government organisation is instrumental in advancing the country's digital economy and the use of artificial intelligence. Through its many initiatives, grants, and capacity-building programmes, MDEC helps businesses, startups, and the development of talent. MDEC accelerates AI innovation and establishes Malaysia as a regional leader by cultivating a vibrant ecosystem (Ministry of Science Technology and Innovation, 2021).

Malaysia places a premium on education and talent cultivation as the means to power the country's AI revolution. A well-trained workforce ready to push the boundaries of AI is made possible through partnerships with educational institutions that provide relevant courses and training programmes. A pipeline of talent to drive Malaysia's digital transformation is being fostered through scholarship and research grants that encourage aspiring AI enthusiasts to explore this cutting-edge field (Ministry of Science Technology and Innovation, 2021).

Now let's have a look the current AI application in Malaysia trucking industry. Malaysian trucking companies are adopting intelligent route optimisation solutions powered by artificial intelligence. Optimisation of routes, travel time, and fuel efficiency are all improved by these systems, which analyse traffic data in real time, past patterns, and delivery schedules. Malaysian trucking firms can better navigate the country's complex road network and meet tighter delivery windows by employing AI technology (Sen Seah et al., 2021).

The trucking industry in Malaysia is rapidly adopting AI-driven fleet management systems. Information such as truck mileage, engine health, and driver habits are collected and analysed by these systems. Fleet utilisation, maintenance schedules, and driver performance can all be optimised with the help of AI algorithms, resulting in greater operational efficiency and lower costs for trucking companies.

Artificial intelligence is being used in Malaysia's trucking industry to keep an eye on shipments and ensure their safety. Surveillance systems powered by AI and featuring video analytics and object recognition can keep an eye on cargo, spot any unusual behaviour, and sound the alarm if there is any sign of theft or tampering. Both trucking companies and their clients can rest easy knowing that their goods are safe and secure, thanks to these systems. In order to reduce traffic jams and speed up delivery times, smart traffic management systems are being implemented all over Malaysia. In order to improve logistics efficiency, AI algorithms analyse live traffic data, anticipate traffic patterns, and recommend the best routes for trucks to take. Intelligent traffic management systems are crucial to improving trucking efficiency in congested cities and along major thorough fares.



In terms of Intelligent Repair and Upkeep, predictive maintenance solutions powered by artificial intelligence are gaining popularity in the Malaysian trucking industry. These systems keep tabs on vehicles in real time, analyse sensor data, and use machine learning algorithms to forecast when repairs will be necessary. Trucking companies can improve fleet reliability, decrease unscheduled downtime, and increase the lifespan of their vehicles by proactively identifying and addressing maintenance needs.

Is AI for Trucking a Good Idea?

There are some benefits and drawbacks of AI to the trucking and transportation industry that must be weighed. Advantages include optimisation of routes, improvement of load planning, reduction of fuel consumption, and minimization of downtime due to maintenance issues. These are just a few ways in which AI-powered technologies, such as intelligent route optimisation and real-time data analytics boost operational efficiency. Artificial intelligence (AI)-powered systems can keep an eye on drivers, identify signs of fatigue or distraction, and send alerts in real time, all of which improve road safety. Further, AI algorithms can be used to help spot potential collisions

and take preventative measures. With the help of artificial intelligence, these systems can track how well trucks are running at all times, anticipate problems, and plan for repairs in advance. Predictive Maintenance lessens the frequency of unforeseen breakdowns, cuts down on the expense of repairs, and improves the dependability of fleets. Artificial intelligence (AI) is a key component in the research and development of fully autonomous trucks. Road safety, fuel efficiency, and reduced human error in long-distance operations are all areas where self-driving vehicles could make a difference. Data analytics fueled by artificial intelligence offer trucking companies' useful information. With insights derived from data companies, improvements can be made on their performance, resource allocation, and operational strategies by analysing massive amounts of data.

On the other hand, there are also a few concerns with regards the application of AI in trucking industry. They include challenges in expense and deployment. The trucking industry would need to spend a lot of money on new hardware, software, and infrastructure if it seeks to embark on full implementation of use of artificial intelligence. Cost is a potential barrier to adoption for smaller and medium-sized trucking companies. Next, the introduction of self-driving trucks has sparked worries about the potential loss of truck driver jobs. While these innovations may help boost productivity, cut costs, and improve safety, they may also have a long-term impact on the job market for drivers. Next, concern on increased use of artificial intelligence in the trucking industry creates massive amounts of data, including personally identifiable information (PII) about drivers, routes, and cargo. Because of the importance of this information, taking strong cybersecurity precautions is essential.

Conclusions

Although AI has made great strides, it may still struggle in some challenging situations, such as those involving extreme weather, complex urban environments, or unexpected road events. It's possible that these situations call for human intervention or creative approaches. There are legal and regulatory hurdles to consider when implementing AI technologies in the trucking industry. To ensure a seamless integration of AI-powered solutions, new and updated regulations pertaining to autonomous vehicles, liability in the event of accidents, and data privacy must be developed and implemented.

We are somewhere between awe and amusement at the rapid adoption of AI by Malaysia's trucking industry. The potential of artificial intelligence in trucking is enormous, ranging from fully autonomous vehicles to data-driven supply chains. Meanwhile, let's prepare for an exciting ride full of innovative breakthroughs, unexpected quirks, and perhaps even a few AI stand-up comedians to keep us entertained on long hauls as AI takes the wheel. The AI adventure in the trucking industry has just begun, and we can't wait to see all the ups and downs that are sure to come. Malaysia, have fun on the highway!