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WHAT'S HOT

7 TECHNOLOGY PATHWAYS TO DIGITAL TRANSFORMATION

An Interview on
**SOCIAL
INNOVATION**
- Dr James Tee

HEADLINE NEWS IN A FLASH

- Meta is building an AI-powered universal language translator
- Maicat, the Cybernetic Companion Cat
- UC Berkeley robot navigation could chart a new-course for self-driving systems
- AI-Created Art Cannot be Copyrighted, US Copyright Office Says
- Physics Breakthrough as AI Successfully Controls Plasma in Nuclear Fusion Experiment
- Researchers artificially reproduce the learning and forgetting functions of the human brain

INDUSTRY FOCUS

TOP 10 APPLICATIONS OF AI AND ROBOTICS IN ENERGY SECTOR

7 TECHNOLOGY PATHWAYS TO DIGITAL TRANSFORMATION



With all eyes and pressure on to produce new ways to excite customers, streamline production, and deliver real-time insights to decision-makers, what's a technology manager to do? First, understand that it means more than a technology fix. "The mainstream availability of a specific set of technology innovations and practices has enabled organizations to transform their business through enhanced automation and data intelligence to achieve greater business value and growth.

In particular, there are seven key technology areas that need to be looked at in any digital transformation initiative, the authors state. Erl, who is CEO of Arcitura Education, is one of the business technology's most prolific authors, well-known for his works on service design principles and patterns. Stoffers is enterprise architect for de Volksbank.

The key technology drivers that should part of a digital transformation include the following:

ENHANCED AND DIVERSE DATA COLLECTION.

"By having a wide range of data as input, digital transformation platforms can offer human decision-makers deeply insightful data intelligence to help improve their decision-making capabilities and further help them discover how new product and service innovations can be introduced," according to Erl and Stoffers. The availability of widely diverse data sources also helps decision-makers "perform highly sophisticated and intelligent forms of automation that can improve both the quality and efficiency of how business is automated." Relevant technologies include big data and analytics, internet of things, and robotic process automation (RPA).

CONTEMPORARY DATA SCIENCE

"Contemporary data science advances are what have propelled digital transformation automation into many organizations, as their automation solutions can now be driven by constant streams of intelligent data that provide genuine value." Relevant technologies include big data and analytics, artificial intelligence, and machine learning.

SOPHISTICATED AUTOMATION TECHNOLOGY

"Bots can be configured to carry out a range of hands-on processing tasks, such as data entry and information routing." The technology that enables this is RPA.

AUTONOMOUS DECISION-MAKING

"This enables the solution to rapidly respond to a range of situations that may have previously required more time for correct human decisions to be carried out." The technology that enables this is AI.

CENTRALIZED, SCALABLE, RESILIENT IT RESOURCES

"Cloud-based environments can provide the necessary infrastructure to support digital transformation performance requirements." The technology that enables this is cloud computing.

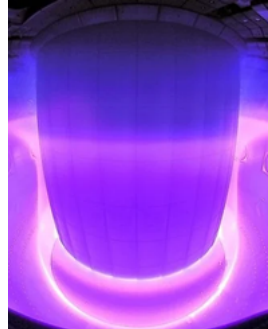
IMMUTABLE DATA STORAGE

"Highly secure storage technology that emerged from the use of cryptocurrencies has made it possible to position immutable repositories alongside corporate databases." The technology that enables this is blockchain.

UBIQUITOUS MULTI-EXPERIENCE ACCESS

This means opening up access to "a range of business interaction options for channels that the customer can choose from. The state of the customer's activity is always preserved across the different access method types." The technology that enables this is cloud computing.

Source: zdnet



HEADLINE NEWS IN A FLASH

META IS BUILDING AN AI-POWERED UNIVERSAL LANGUAGE TRANSLATOR

During a streamed event, Meta CEO Mark Zuckerberg talked more about the Metaverse his company has been investing in - including that Meta's research division is developing a universal speech translation system. This system would ideally allow users from around the globe to seamlessly interact with each other inside Meta's digital universe. Meta has a two-part plan to make this happen. First, Meta is developing No Language Left Behind, a translation system that can learn every language, "even if there isn't a lot of text available to learn from. After that, Meta wants to create an artificial intelligence (AI), with the goal to offer "instantaneous speech-to-speech translation across all languages, even those that are mostly spoken; the ability to communicate with anyone in any language".

Source: pocket-lint

MAICAT, THE CYBERNETIC COMPANION CAT

Macroact, the personal robotics development lab operating out of South Korea, has released their first AI based companion pet. Designed for education and entertainment, Maicat will launch on Kickstarter at the end of February 2022 after years of design and testing. MAICAT is described to be an autonomous robot pet, has facial, voice pattern and emotional recognition software. Integrated IoT connectivity allows you to add Maicat's sensors and capabilities to your existing home network. Maicat is an excellent platform to get students interested in STEM topics. With an app and the Maicat SDK, students can study AI, programming, robotics, facial recognition. Maicat was a CES 2022 Innovation Award nominee for its IoT integration and support. It is small and light enough to pick up and pet. Sensors within its body let Maicat know it's being petted and Maicat will respond lovingly.

Source: geeky-gadgets

UC BERKELEY ROBOT NAVIGATION COULD CHART A NEW-COURSE FOR SELF-DRIVING SYSTEMS

An approach that uses hours of video and elements of reinforcement learning can guide a robot vehicle almost two miles without a full map of the surroundings. The droid sticks to paths and dodges previously unseen obstacles. Essential is that it doesn't map its environment, as some other approaches have done, such as in autonomous driving AI programs. Instead, it relies on heuristics picked up from thirty hours of video of previous runs, and some overhead maps of the terrain, to create an improved schematic of the way way stations along the way relate to one another, without a full map.

Source: zdnet

AI-CREATED ART CANNOT BE COPYRIGHTED, US COPYRIGHT OFFICE SAYS

A three-person board was tasked with reviewing a 2019 ruling that had been made against a man named Steven Thaler, who had filed for the copyright to an art piece, titled A Recent Entrance to Paradise that had been made by an AI algorithm he named Creativity Machine. After reviewing the statutory text, judicial precedent, and longstanding Copyright Office practice, the Board again concludes that human authorship is a prerequisite to copyright protection in the United States and that the Work therefore cannot be registered."

Source: petapixel

PHYSICS BREAKTHROUGH AS AI SUCCESSFULLY CONTROLS PLASMA IN NUCLEAR FUSION EXPERIMENT

For decades, scientists have been taking incremental steps towards this goal, but many challenges remain. One of the core obstacles is successfully controlling the unstable and super-heated plasma in the reactor - but a new approach reveals how we can do this. In a joint effort by EPFL's Swiss Plasma Center (SPC) and artificial intelligence (AI) research company DeepMind, scientists used a deep reinforcement learning (RL) system to study the nuances of plasma behavior and control inside a fusion tokamak - a donut-shaped device that uses a series of magnetic coils placed around the reactor to control and manipulate the plasma inside it. In a new study, however, researchers show that a single AI system can oversee the task all by itself. "Using a learning architecture that combines deep RL and a simulated environment, we produced controllers that can both keep the plasma steady and be used to accurately sculpt it into different shapes," the team explains in a DeepMind blog post.

Source: sciencealert

RESEARCHERS ARTIFICIALLY REPRODUCE THE LEARNING AND FORGETTING FUNCTIONS OF THE HUMAN BRAIN

Neuromorphic computing, a new brain-inspired computation paradigm, reproduce the activity of biological synapses by using artificial neural networks. Such devices work as a system of switches, so that the ON position corresponds to the information retention or 'learning', while the OFF position corresponds to the information deletion or 'forgetting'. The project was led by Serra Hunter Fellow Enric Menéndez and ICREA researcher Jordi Sort, both at the Department of Physics of the UAB, and is part of Sofia Martins PhD thesis. In addition to neuromorphic computing, other practical applications such as magnetic memories and spintronics will benefit from the results of this study.

Source: thebrighterside

AN INTERVIEW ON

SOCIAL INNOVATION

AI FOR POSITIVE IMPACT



DR JAMES TEE

Chief Executive Officer,
Smart City & Urban Tech,
Green Packet Berhad

01 *Your thoughts and views on the disadvantaged groups on employability issues and what can be done to help them.*

- Identify relevant skill sets needed for certain relevant industries
- Identify the skill gaps e.g. CV-writing, presentation skills besides industry know-how and technical knowledge
- Upskill through technology-driven training sessions: online, podcast, pre-recorded online learning
- Create a database of job openings and AI-matching them with suitable candidates

02 *The types of schemes that could be considered and formulated by policy makers to help address employment and education issues.*

- Encourage FDI/DDI to create jobs especially in the digital economy
- Match job openings with the candidates
- Review the education syllabus and curriculum together industry practitioners vs the requirements of the industry

03 *The role of technology like AI to help institutions perform their tasks to manage the disadvantaged groups across the value chain (upstream / downstream).*

- In order to use AI technology, firstly we need to collect good quality data
- Establish the processing power and algorithms required to process and analyze data
- Attract suitable "brain power" or experts to generate insights (from descriptive, diagnostic, predictive to prescriptive)

04 *What do you think will be the key success factors of using AI for this purpose?*

- Clean and good quality data
- Suitable algorithm to generate insights
- AI expertise to extract insights and project champion to implement the project
- Technology is just a tool. Must get buy-in from the leadership team and stakeholders in order to ensure successful execution

05 *What type of human-machine engagement model needs to be done? How do you maintain the balance between machines and humans for this type of beneficiary evaluation and social impact assessment?*

- Machine can be used for repetitive data crunching and simple tasks (80% of work)
- Human will focus on problem solving and decision making (20% of work)
- Leverage on human-machine strengths to get the best results

TOP 10 APPLICATIONS OF AI AND ROBOTICS IN ENERGY SECTOR

The combination of new technologies is creating massive, new opportunities for energy companies to improve efficiency, optimise performance, drive innovation, and accelerate growth. However, rather than trying to simply mimic solutions developed in other industries, it will be important for energy companies to focus on energy-specific solutions.

The energy sector is in an especially good position to take advantage of these next-generation technologies. Here are the top 10 applications and their industry benefits:

10: CUSTOMER ENGAGEMENT

The energy sector is starting to use AI and machine learning for customer engagement. By using AI and machine learning, energy companies can provide customers with information that is specific to their needs. This involves using data analytics to understand customer energy usage and then providing customers with information about how they can reduce their energy consumption by changing their usage habits.

09: MICROGRIDS

A microgrid is a small energy grid that can operate independently of the traditional energy grid. Microgrid control systems use AI and machine learning to manage energy flow and optimise energy usage. Microgrids are becoming popular because they can provide energy security during emergencies and can integrate renewables into the energy grid more easily than traditional energy grids.

08: POWER THEFT AND ENERGY FRAUD DETECTION

Theft and fraud of electricity costs the energy and utilities industry as much as \$96bn every year globally, with as much as \$6bn every year in the United States alone. Power theft is the illegal tapping of energy from the grid. Energy fraud is the intentional misrepresentation of energy data or energy usage. AI and machine learning can automatically detect these anomalies and flag them for energy companies to resolve. This allows energy companies to protect their assets, reduce energy waste, and save money.

07: ENERGY TRADING

Trading energy is different from trading other commodities because energy has to be delivered immediately. This presents a challenge for energy traders, but it is also an opportunity because energy markets are becoming more liquid.

AI and machine learning can be used to make energy trading more efficient by predicting energy demand and providing traders with real-time information about energy prices. With this information, energy traders can then make more informed decisions about when to buy and sell energy.

Blockchain technology has been used to create power purchase agreements (PPAs), a type of financial contract between energy buyers and energy sellers. Blockchain technology makes these contracts more efficient because it reduces transaction time, costs less to use than traditional PPA platforms, and is built on a highly secure platform.



06: ENERGY STORAGE

The global energy storage market is set to grow 20 times by 2030. Smart energy storage systems are energy storage technologies that can be integrated into the energy grid to make energy management more efficient.

Energy storage is also being used to create virtual power plants, which allow energy companies to deliver energy when it is needed even if their current energy supply isn't enough. This helps to reduce the need for energy companies to build new power plants.

05: PREDICTIVE ANALYTICS

Predictive analytics can be used to predict how energy demand will change in the future. This information can then be used to plan for the future and build the necessary infrastructure to meet future energy needs.

By using predictive analytics, energy companies can also predict when a machine or piece of equipment is likely to fail. This not only helps to prevent unexpected outages, but it also saves money by allowing companies to plan for the replacement of critical and expensive energy assets and avoid unplanned maintenance work.

04: INCREASED PRODUCTION

AI and machine learning are also being used to improve production in the energy sector.

For example, oil and gas companies are using machine learning algorithms to improve well placement and increase production. By analysing data collected from seismic surveys and other sources, these companies can make better decisions about where to drill for oil and gas. This will increase energy efficiency and create a simpler, more efficient energy grid that is easier to maintain by energy companies.

03: GRID MANAGEMENT AND EFFICIENCY

AI is used to optimise energy grids by managing energy flows between homes, businesses, storage batteries, renewable energy sources, microgrids, and the power grid itself. This reduces energy waste while increasing consumer engagement with energy consumption.

Renewable energy sources like wind and solar are becoming more popular, but they are intermittent energy sources. This means that energy from these sources is not always available when it is needed.

This presents a problem for the energy grid because the energy has to be managed in real-time as it is being generated. AI and machine learning can help energy companies to predict when renewable energy will be available and manage energy grids accordingly.

Robots are also being used in energy installations and grid maintenance, and for monitoring energy generation and energy consumption. Robots can be used for tasks such as repairing pipelines, wind turbines, and other energy infrastructure. By automating these tasks, energy companies can further improve efficiency and reduce costs.

02: GRID SECURITY

The energy grid is a complex system that is vulnerable to cyberattacks. AI and machine learning can be used to improve the security of energy grids by preventing cyberattacks before they happen.

This involves using data analytics to identify patterns in energy data that may be indicative of a cyberattack. Once a cyberattack has been identified, AI and machine learning can be used to respond to the attack.

01: SMART GRIDS

Grids can now be integrated with sensors, data analytics tools, energy storage systems, energy management platforms, and other types of energy technology to become 'smart'.

By using smart grids, energy companies can collect energy usage data from every single device on the grid, and then use this information to develop energy efficiency projects for their customers. It also allows energy companies to monitor energy flow and energy use in near real-time.

Energy companies can then reduce energy consumption through automated demand response systems which can turn off energy during peak hours, resulting in energy savings for homeowners as well as energy companies.

Source: EnergyDigital



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3 LEVELS



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