DIGI DIGEST

DIGITAL BUZZ

NEWS YOU MISSED

NOW EXPERIENCE THE POWER OF CHATGPT ON YOUR OWN DATA !!

The **Azure OpenAI Service on your data** is a groundbreaking new feature that allows businesses to harness the power of OpenAI models, such as ChatGPT and GPT-4, with their data, providing greater accuracy, speed, and valuable insights, enabling them to gain a competitive edge. It helps businesses to run OpenAI models directly on it, eliminating the need for training or fine-tuning.

With the advanced conversational AI capabilities of ChatGPT and GPT-4, organizations can **streamline communication, enhance customer service, enable self-service data requests, drive revenue generation, and boost productivity.** This powerful service streamlines processes such as document intake, indexing, software development and HR procedures providing quick access to legal insights and financial data for strategic decision-making.

Source: https://tinyurl.com/kdc79kns

UBER UNVEILS ECO-FRIENDLY RIDES WITH REAL-TIME CO2 MONITORING: JOIN THE GREEN REVOLUTION TODAY!

Uber is incorporating smart charging, emissions tracking, and user incentives to promote the adoption of electric vehicles. Using machine learning, Uber provides drivers with real-time data on traffic, charging station prices, availability, and battery levels. This technology assists drivers in determining optimal charging times and locations for their electric vehicles, contributing to a greener and more sustainable future for mobility.

They have also implemented several eco-friendly features, including a carbon emissions tracker that informs passengers about the emissions they have saved by choosing Uber Green or Comfort Electric rides. Moreover, Uber provides drivers with eco-friendly route suggestions to enhance fuel efficiency and reduce environmental impact.

Source: https://tinyurl.com/digidigest

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ReD.

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STARTUPS IN FOCUS

Renkube (Bengaluru, India) is a budding company focused on solar energy solutions with many innovative projects. Renkube is dedicated to improving the energy yield of solar panels. They have developed a light-harvesting glass that increases the energy output of solar panels by 20% using machine learning algorithms known as Motion Free Optical Tracking (MFOT) technology. The goal is to capture more sunlight without needing chemical coatings or electro-mechanical components and to optimize energy generation throughout the day without exceeding peak ratings. By addressing these challenges, Renkube aims to enhance the efficiency and effectiveness of solar energy solutions.

Read more at https://www.renkube.com/

Tomorrow.io (Boston, USA) aims to revolutionize weather forecasting by incorporating the power of Industry 4.0 technologies. They plan to create a constellation of weather radar satellites under its Operation Space Tomorrow (>20 satellites) to improve forecasting accuracy and coverage. So far this year, the company has made two significant announcements, including the successful launch of the world's first commercially built satellite carrying a Ka-band weather radar and the industry's first weather and climate generative AI, nicknamed "Gale." Supercharged by next-generation space technology, cutting-edge generative AI, and proprietary modeling capabilities, global leaders, including JetBlue, Fox Sports, The United States Air Force, Ford, and Uber rely on their solution daily.

Read more at https://www.tomorrow.io/company/

EMERGING BUSINESS MODELS

GENERATIVE AI: THE NEXT FRONTIER IN RENEWABLE ASSETS O&M

Generative AI, an advanced AI technique, offers innovative solutions to drive transformation and shape the future of the Energy & Utilities sector. Recognizing this immense potential, several energy companies strive to seize fresh prospects, optimize processes, and boost productivity by adopting generative AI. Some use cases are **weather forecasting, optimizing turbine performance, power demand forecasting, development of Smart Grids and dynamic power distribution**. These models can also help in **increasing energy efficiency while decreasing carbon emissions**. A report estimates that the market for Generative AI in the Energy sector could reach **~ $4b by 2032 through a CAGR of 24%**. Some of the firms at the vanguard of this evolution are SparkCognition and Gridmatic.

SparkCognition's Renewable Suite is a generative AI platform specifically designed for renewable energy asset management. This technique provides more value than traditional solutions and makes the data more accessible, actionable and impactful. The GPT allows operators to perform custom data analysis tasks efficiently and automate the workflow, enabling them to gain insights into their renewable energy assets performance. It automates workflows, allowing prompt summaries of component failures and vendor reports via simple prompts. The platform leverages Large Language Models, enhancing outcomes and accelerating processes even with limited data by continuously retraining the model. Its impact on decision-making and data management in the industrial sector is revolutionary.

Read more at: https://www.sparkcognition.com/products/renewable-suite/

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DATA SCIENCE BOOTCAMP

ETL : EXTRACT, TRANSFORM, AND LOAD

ETL refers to **moving data** from **one or more source systems** into a **single destination system**. It is the first step of any Data Science project and is generally carried out by Data Engineers. It is used to consolidate all relevant data from different sources into a single repository to make it actionable—to analyze it and enable executives, managers, and other stakeholders to make informed business decisions based on it.

Organizations have been using ETL for decades. But what's new is that both the sources of data, as well as the target moving to the cloud.

As the name suggests, the process typically involves three systems:

•**Extract**: ReD. gathers data from the sources such as SCADA, FTP, and Websites. This is done using various tools, including Python, database connectors, file readers, and web scraping tools.

•**Transform:** ReD. takes the extracted data and converts it into a standardized format. This process pertains to cleaning, eliminating duplicate and constant records, and converting data type.

•**Load:** The transformed data is automatically loaded into the destination system, specifically the Cloud, for ReD.'s purposes, which involves using pipelines.

Source: ReD. Editorial Team

DIGIFACTS

Monthly Energy Consumption (MU)
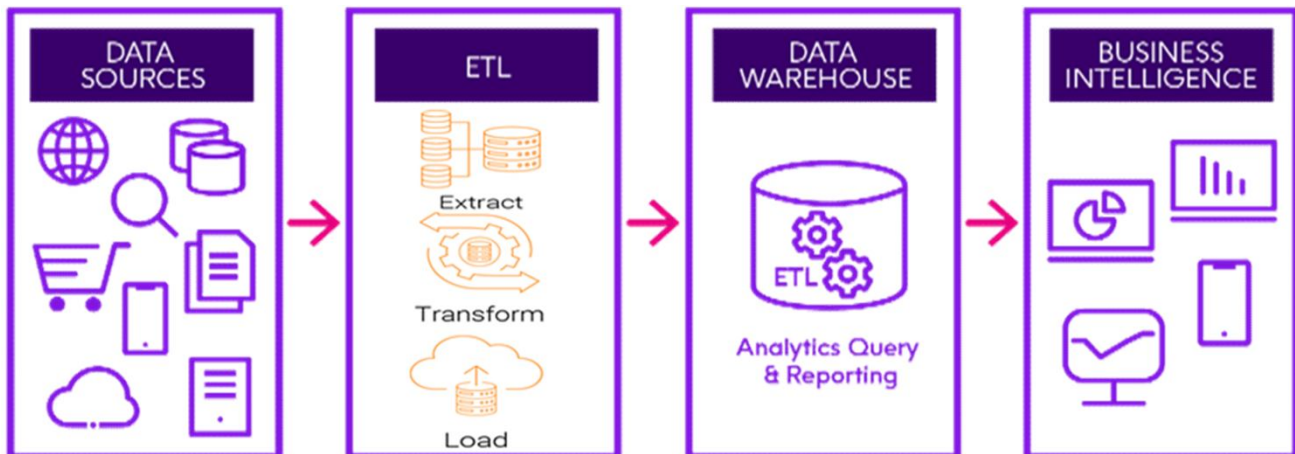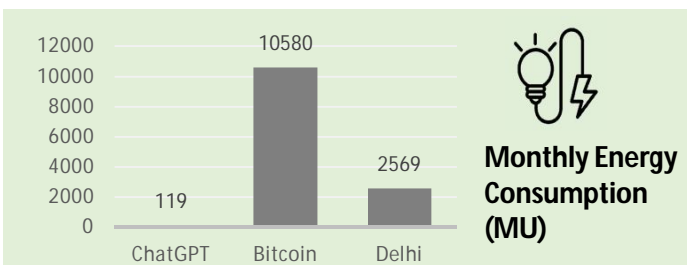
$407bn
Projected AI Market Size by 2027

$3.8tn
Estimated Gain in Global Manufacturing Sector through AI Adoption by 2035

1mn
Users garnered by ChatGPT within the first five days of its release

Source: Forbes

ReD.

ENHANCING RENEW'S DIGITAL MATURITY

USE CASE STORY
ENHANCING EFFICIENCY AND RELIABILITY: THERMOGRAPHY APPLICATIONS IN BALANCE OF PLANTS

Problem Statement:

With a vast network of transmission lines spanning thousands of kilometers across ReNew's portfolio in India, **identifying and rectifying hotspots** becomes **time-consuming and inefficient**. **The reliance on third parties** with **limited expertise** and the manual inspection process leads to long lead times, lower accuracy, and potential losses worth millions of dollars due to breakdowns.

Image taken from thermography camera showing hotspot

Same image taken from normal camera where hotspot cannot be seen at all

Fig: eBOP Thermography

Solution:

To address this problem, an automated solution was developed using **image classification machine learning models.** These models are trained to **identify hotspots** in **thermographic images** based on specific business logic and standard operating procedures (SOPs). An automated data pipeline was implemented, connecting **ReNew's document management system to Azure**, allowing for the automatic processing of many images.
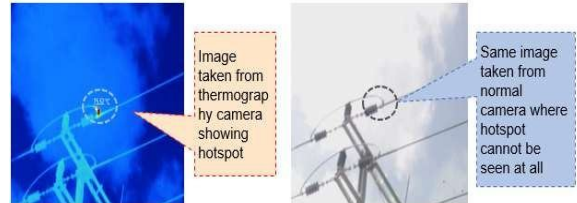
**Padmanava Swain,
Transmission Line Team**

Benefits:

The automated hotspot detection solution in the wind and solar energy sector offers significant benefits, including a 62% reduction in downtime, 30x faster hotspot identification, 73% improved employee efficiency, and 30% shorter spare procurement time. It enhances operational efficiency, minimizes maintenance delays, and ensures uninterrupted power supply.

Sincere thanks to Padmanava Swain and transmission line team for their innovative problem solving.

Source: Asset Management, ReD. Team

APPLICATION OF EMERGING TECHNOLOGIES

AI-BASED DEFECT IDENTIFICATION

What is AI-Based Defect Identification?

Defect identification detects defects in wind turbines, solar modules, or manufactured goods by analyzing optical or thermographic images captured either manually or through drones. This process typically utilizes Machine Learning and AI. Machines **trained on large datasets identify defect-containing images**, while **AI eliminates false positives and categorizes defects**. Some challenges include imbalanced class distribution, background-foreground separation, and limited generalization to unseen object categories.
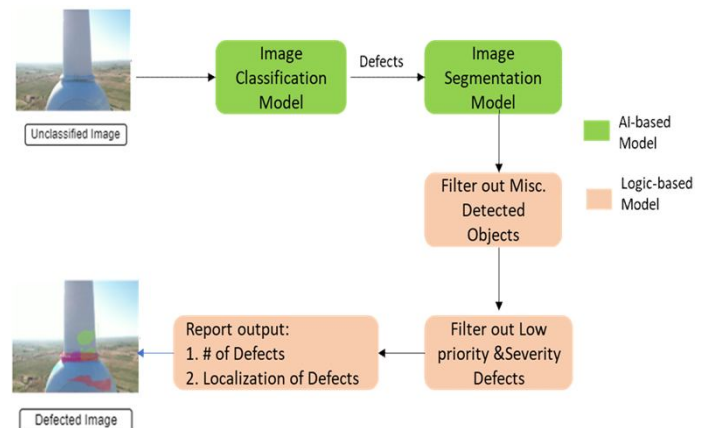
How the Asset Management Team is Bridging The Gap?

ReD. uses machine learning to detect defects in wind turbines. By training the ML algorithm with annotated data, ReD. enables the algorithm to recognize defect features and accurately categorize each type. Once trained, inspections promptly flag turbines showing indicative defect features for further investigation.

This process enhances product quality, reduces turnaround time, saves costs, and improves accuracy. Methods like **data augmentation, class weighting, transfer learning,** and **advanced architecture** like **U-Net-2** overcome challenges of imbalanced class distribution and background-foreground separation, improving object segmentation accuracy. **Sincere thanks to Gaurav Saxena and team of Blade experts for their contributions to this innovation.**

If you have any ideas or suggestions, don't hesitate to contact us at Red.Communications@renew.com

Source: Asset Management, ReD. Team

ReD.