**Exploring Generative AI Tools for Data Analytics**

Several generative AI tools empower data analysts to extract deeper insights from data. These tools encompass diverse capabilities, catering to specific data analytics needs.

* RapidMiner: A comprehensive platform for data science and machine learning, incorporating generative AI capabilities for predictive modeling and data augmentation.
* Tableau: The leading data visualization tool that has integrated generative AI features to automate data preparation and generate insights with natural language queries.
* IBM Cognos Analytics: Cognos Analytics offers AI-powered automation and insights, allowing users to describe data and test hypotheses. This transforms business teams into power users, allowing data analysts to focus on deeper insights. AI capabilities provide accurate, trusted business information, forecast future outcomes, and explain why they may happen.
* Google AI's Imagen: A text-to-image diffusion model that can generate realistic and creative images from text descriptions. It can create data for image classification, object detection, and image segmentation tasks.
* OpenAI's DALL-E 2: A text-to-image diffusion model similar to Imagen. It can also generate realistic and creative images from text descriptions. However, DALL-E 2 is still under development and unavailable to the public.
* Nvidia's StyleGAN2: A generative adversarial network (GAN) that can generate high-quality images of faces. It can create data for face recognition and facial expression analysis tasks.
* DeepMind's Gato: A general-purpose AI agent can perform various tasks, including data analytics. It can generate data for tasks such as text classification, sentiment analysis, and machine translation.
* Hugging Face's Transformers: A natural language processing (NLP) library that includes a variety of generative models, such as GPT-3 and BART. These models can generate text, translate languages, and write creative content.
* Salesforce Einstein GPT: A large language model (LLM) integrated into the Salesforce Einstein platform. It can generate data for various tasks, such as customer service, sales, and marketing.
* Google Cloud AutoML: A suite of machine learning products that includes a variety of generative models, such as AutoML Natural Language and AutoML Tabular. These models can generate data for various tasks, such as text classification, sentiment analysis, and image classification.
* IBM Watson Studio: A cloud-based data science platform that includes a variety of generative models, such as Watson Natural Language Understanding and Watson Visual Recognition. These models can generate data for various tasks, such as text classification, sentiment analysis, and image classification.
* Microsoft Azure Machine Learning: A cloud-based machine learning platform that includes a variety of generative models, such as Azure Cognitive Services Text Analytics and Azure Cognitive Services Computer Vision. These models can generate data for various tasks, such as text classification, sentiment analysis, and image classification.
* Amazon SageMaker: A cloud-based machine learning platform that includes a variety of generative models, such as Amazon Comprehend and Amazon Rekognition. These models can generate data for various tasks, such as text classification, sentiment analysis, and image classification.
* OpenAI's Code Interpreter: The ChatGPT Advanced Data Analysis, formerly known as Code Interpreter, is a plugin released in July 2023 that enables ChatGPT users to upload data or code and prompts ChatGPT to perform analysis and generate insights. Using the plugin, ChatGPT can create visualizations (charts, maps, and so on) and summarize the data.
* Lime: This tool explains the decisions made by machine learning models.
* SHAP: This tool explains the decisions made by machine learning models.
* Captum: This is a library of explainable AI tools for PyTorch.
* DataWrangler: This tool uses natural language processing (NLP) to clean and normalize data.
* OpenRefine: This tool transforms data by applying various operations, such as filtering, sorting, and grouping.
* Featuretools: This tool generates new features from existing data automatically.
* H2O Driverless AI: This tool uses machine learning to generate and select features automatically.
* TPOT: This tool uses genetic programming to generate and optimize machine learning pipelines automatically.
* Prophet: It forecasts time series data.
* LightGBM: It builds gradient-boosting trees for machine learning.
* XGBoost: It builds gradient-boosting trees for machine learning.
* StyleGAN: It generates realistic images of faces.
* CycleGAN: It translates images from one style to another.
* BigGAN: This generates high-resolution images.
* spaCy: This is a tool for natural language processing in Python.
* Stanford CoreNLP: This is a tool for natural language processing in Java.

**NOTE**: StyleGAN, CycleGAN, and BigGAN are all generative AI tools that can generate realistic images. These tools use various techniques, such as generative adversarial networks (GANs), to create new images similar to real-world images.

Other tools, such as DataWrangler and OpenRefine, are not directly based on generative AI but can be used to create training data for generative AI models. These tools can be used to clean and normalize data and transform data into a format suitable for training generative AI models.

Still, other tools, such as Prophet, LightGBM, and XGBoost, are not generative AI tools, but they can be used in conjunction with generative AI models to improve the performance of predictive modeling tasks. These tools can be used to build machine-learning models to make predictions based on historical data.

Integrating generative AI into data analytics is still in its early stages, but its potential is immense. As generative AI models evolve, they will become increasingly sophisticated in their ability to analyze data, uncover hidden patterns, and provide actionable insights. Data analysts who embrace generative AI will be well-positioned to extract maximum value from data, drive innovation, and transform their organizations.

Generative AI transforms the data analytics landscape, empowering businesses to make informed decisions, optimize processes, and gain a competitive edge. By harnessing the power of generative AI, data analysts can uncover hidden patterns, predict future trends, and personalize insights, driving innovation and shaping the future of business.

**Key Features of IBM watsonx for Data Analytics**

**Data collection and integration**

watsonx provides various tools for connecting diverse data sources, including databases, cloud storage, and real-time data streams. It seamlessly integrates data from different formats and structures, enabling a unified view of the organization's data landscape.

**Data preparation and preprocessing**

watsonx offers data cleaning, transformation, and wrangling capabilities to prepare data for analysis. It automates repetitive tasks, identifies and handles missing values, and transforms data into a format suitable for analysis.

**Exploratory data analysis (EDA)**

watsonx provides interactive data visualization tools to explore and understand patterns, trends, and anomalies within the data. It allows users to visually examine data distributions, correlations, and outliers, gaining insights into the underlying data patterns.

**Machine learning and predictive analytics**

watsonx offers a range of machine-learning algorithms and tools for building predictive models. It supports supervised, unsupervised, and reinforcement learning techniques, enabling businesses to forecast future trends, identify customer behavior patterns, and optimize decision-making.

**Real-time data analytics**

watsonx provides capabilities for real-time data ingestion, analysis, and visualization. It enables businesses to monitor events as they happen, identify potential issues, and make timely decisions based on real-time insights.

**Explainable AI (XAI)**

watsonx incorporates XAI features to explain machine learning models' reasoning and decision-making processes. It helps users understand the factors contributing to model predictions, ensuring transparency and accountability in AI-driven decisions.

**Collaboration and knowledge sharing**

watsonx supports collaborative data analysis workflows, enabling teams to share data, insights, and models. It facilitates knowledge sharing and fosters a data-driven culture within the organization.

**Deployment and integration**

watsonx provides tools for deploying data analysis models and integrating them into business processes and applications. It enables businesses to leverage data insights to drive operational efficiency, improve customer experiences, and gain a competitive edge.

**Case Study: NatWest Group's Digital Mortgage Support Transformation**

**Background**

Owning a home is a cherished dream for many, and a bank-issued mortgage is crucial in realizing this dream. However, obtaining a mortgage has become increasingly complex with evolving regulations and processes. Banks, including NatWest Group, are challenged to provide accurate real-time policy information tailored to each customer's unique needs throughout the home-buying process.

**The challenge**

To streamline the mortgage application process, NatWest collaborated with IBM® to develop a digital mortgage support tool. This tool aimed to enhance customer loyalty, reduce call duration, and provide real-time support to home buyers.

**The solution**

IBM Consulting™ and NatWest co-created "Marge," an AI-powered, cloud-based platform using IBM Watson Assistant technology on IBM Cloud®. Marge is intentionally personified as a member of the NatWest team, equipped with her evolving personality. Integrated into NatWest's existing data structures, Marge continually receives updates through content additions and customer interactions.

**Implementation and impact**

**Increased customer loyalty**

Since deploying the digital mortgage support tool, NatWest has witnessed a remarkable 20% improvement in customers' Net Promoter Score (NPS), a key metric for customer loyalty.

**Time savings**

Call durations have seen a significant 10% reduction attributed to the efficiency of the digital mortgage support tool.

**Seamless support**

During customer calls, NatWest employees now have a single access point for digital mortgage support. Marge assists by quickly providing relevant information when employees input keywords into a console.

**Technological backbone**

The platform leverages IBM Watson Assistant technology and is hosted on IBM Cloud. Marge, residing directly on the cloud, is intricately embedded within NatWest's data structures. This ensures she has real-time access to new data, contributing to her continuous learning and evolving capabilities.

**Future prospects**

As Marge evolves, NatWest aims to empower its employees further during the ongoing digital transformation. The ultimate goal is to align with IBM's vision for the next-gen business model - becoming a Cognitive Enterprise.

**About NatWest Group**

NatWest is a prominent banking and financial services company headquartered in the UK. Serving approximately 19 million people, families, and businesses in the UK and Ireland, NatWest is committed to innovation and customer-centric solutions. With a focus on becoming a Cognitive Enterprise, NatWest continues to shape the future of banking.

**Key metrics**

20% improvement in Customer NPS  
10% reduction in Call Duration  
Note: All metrics are based on data collected since the implementation of the digital mortgage support tool.

Ref: <https://www.ibm.com/case-studies/natwest-group-watson>

Various organizations across various industries are using IBM watsonx for data analysis. Here are a few examples:

**Healthcare**

**Mount Sinai Health System**

watsonx analyzes patient data to identify patterns and trends that can improve patient care.

**Mayo Clinic**

watsonx is being used to develop a new diagnostic tool for Parkinson's disease.  
St. Jude Children's Research Hospital: watsonx analyzes genomic data to identify potential drug targets for cancer treatment.

**Financial Services**

**Barclays Bank**

watsonx analyzes financial data to identify fraud and other financial crimes.

**Citibank**

watsonx analyzes customer data to improve customer service and marketing campaigns.

**HSBC**

Watsonx is used to analyze risk data to make more informed lending decisions.

**Retail**

**Walmart**

watsonx is used to analyze sales data to optimize product placement and pricing.

**Target**

watsonx is used to analyze customer data to personalize marketing campaigns and recommendations.

**Kroger**

watsonx analyzes supply chain data to improve efficiency and reduce costs.

**Manufacturing**

**Siemens**

watsonx analyzes sensor data from manufacturing equipment to identify potential problems and prevent downtime.

**GE**

watsonx is being used to analyze data from aircraft engines to predict maintenance needs.

**Ford Motor Company**

watsonx is used to analyze vehicle data to improve fuel efficiency and safety.

**Energy and Utilities**

**ExxonMobil**

watsonx analyzes geological data to identify potential oil and gas reserves.

**National Grid**

Watsonx is being used to analyze energy consumption data to identify areas where energy efficiency can be improved.

**Enel**

watsonx analyzes weather data to predict energy demand and optimize power generation.

**Conclusion**

These are just a few examples of the many organizations using IBM watsonx for data analysis. watsonx is a powerful tool that can be used to gain insights from data and make better decisions across a wide range of industries.