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Data & Analytics Glossary

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Five Fascinating Machine Learning Trends to Watch in 2025

As we advance into 2025, the machine learning (ML) landscape is undergoing transformative shifts that promise to redefine industries and drive innovation. Here are the top five machine learning trends you should watch out for this year:

1. **Generative AI Goes Mainstream**

Revolutionizing Content Creation: Generative AI models, such as GPT-4o and beyond, have become integral in creating high-quality content across various media, including text, images, and even video. Businesses utilize these models to automate content generation, streamline creative processes, and enhance marketing strategies.

Industry-Specific Applications: From automated report generation in finance to personalized content in entertainment, generative AI enables tailored solutions that meet specific industry needs. For example, in healthcare, generative models assist in drafting patient reports and generating synthetic medical data for research without compromising privacy.

Ethical Considerations: With the rise of generative AI, concerns around misinformation, deepfakes, and intellectual property rights have intensified. Organizations must implement robust ethical guidelines and verification mechanisms to ensure responsible use of these technologies.

For insights into Generative AI applications and future trajectory, refer to the article "Generative AI in 2025: Productivity, Cybersecurity and Creativity."

Our Advice: Generative AI is a powerful tool, but its value lies in application. Businesses should assess their specific needs and consider pilot projects to test its efficacy before scaling. For example, if you're in marketing, explore its capabilities in ad copy generation and A/B testing. Always pair generative AI with human oversight to maintain authenticity and ethical standards.

2. **AI-Driven Cybersecurity Enhancements**

Proactive Threat Detection: In 2025, machine learning algorithms will be at the forefront of cybersecurity, enabling real-time threat detection and response. Advanced ML models can identify unusual patterns and potential breaches before they escalate, providing a robust and proactive defense mechanism.

Adaptive Security Systems: Leveraging reinforcement learning, cybersecurity systems are becoming more adaptive. They continuously learn from new threats and evolve to counteract sophisticated cyber-attacks. This adaptability is crucial in an era where cyber threats are becoming increasingly complex and frequent.

Privacy-Preserving Techniques: Integrating ML with privacy-preserving technologies like homomorphic encryption and federated learning ensures that sensitive data used for cybersecurity remains protected, addressing security and privacy concerns.

Explore the predictions for 2025 in the Forbes article "2025 Predictions: The Impact Of AI On Cybersecurity."

Our Advice: Cybersecurity solutions leveraging ML should be tailored to your organization's specific threat landscape. Start by conducting a risk assessment to identify vulnerabilities. Look for AI-driven solutions that offer scalability, integration with existing security infrastructure, and adaptability to emerging threats.

3. **Quantum Machine Learning Emerges**

Harnessing Quantum Computing: Quantum machine learning (QML) is making significant strides in 2025, leveraging the principles of quantum computing to solve complex ML problems faster than classical computers. QML can potentially revolutionize areas such as drug discovery, financial

modeling, and cryptography.

Hybrid Quantum-Classical Models: Integrating quantum and classical computing resources enables hybrid models to tackle previously deemed intractable tasks. This synergy enhances computational efficiency and opens new research and application development avenues.

Accessibility and Development Tools: As QML matures, the development of accessible tools and frameworks is accelerating, allowing more data scientists and researchers to experiment with quantum algorithms and integrate them into existing ML workflows.

For an in-depth analysis, read "The Future Of AI: Unleashing The Power Of Quantum Machine Learning."

4. **Edge AI with Enhanced Capabilities**

Advanced On-Device Processing: Edge AI continues to evolve, with 2025 seeing more powerful on-device processing capabilities. This advancement allows for sophisticated ML inference directly on devices like smartphones, IoT gadgets, and autonomous systems, reducing latency and dependence on cloud infrastructure.

Energy Efficiency and Sustainability: Innovations in hardware design and algorithm optimization are making edge AI more energy-efficient, addressing sustainability concerns. Low-power AI chips and optimized neural networks ensure that edge devices can perform complex tasks without excessive energy consumption.

Expanded Use Cases: From real-time language translation and augmented reality in consumer electronics to predictive maintenance in industrial settings, edge AI enables a wide array of applications requiring immediate data processing and

decision-making.

Learn more about its impact in the article “Edge AI: The Next Wave Of Intelligent Innovation.”

Our Advice: Businesses should focus on applications where low latency and real-time insights are critical. Evaluate the hardware and software ecosystem to ensure compatibility and scalability. For example, companies in manufacturing could deploy edge AI for predictive maintenance, reducing downtime and optimizing operations.

5. **Regulatory-Driven AI Governance**

Evolving Legal Frameworks: As AI integrates more into critical sectors, 2025 will witness the establishment of comprehensive regulatory frameworks governing AI development and deployment. These regulations ensure transparency, accountability, and ethical use of machine learning technologies.

AI Auditing and Compliance: Organizations are investing in AI auditing tools and practices to ensure their ML models comply with new regulations. This includes regular assessments of model fairness, bias mitigation, and adherence to data privacy laws.

Global Standards and Collaboration: International collaboration fosters the creation of unified AI standards, facilitates cross-border cooperation, and ensures that AI advancements align with global ethical and legal norms. Staying abreast of these regulations is essential for businesses to operate seamlessly across different regions.

Stay informed with the latest developments in “Global AI Regulation in 2025: Proposed Laws and Frameworks.”

Our Advice: Regulatory compliance can be a daunting task, but it’s a critical investment. Start by assigning a dedicated

team to monitor changes in AI regulations. Implement robust documentation and auditing practices to ensure traceability and accountability. Partnering with legal and ethical AI experts can help navigate complex regulatory landscapes.

Qlik OpenAI Connector: 3 Essential Benefits

Qlik’s OpenAI connector is a powerful tool that allows you to leverage the capabilities of OpenAI’s natural language models within your Qlik apps.

What is the Qlik OpenAI Connector?

The Qlik OpenAI Connector is a Qlik Sense extension that enables you to send prompts to OpenAI’s natural language models and receive responses in your Qlik apps. You can use the connector in various ways, such as:

1. In chart expressions, to generate natural language insights or explanations based on your data
2. In the data model, to enrich your data with additional information or analysis from OpenAI
3. In application automation, to automate tasks or workflows that involve natural language processing or generation

How does the Qlik OpenAI Connector work?

To use the Qlik OpenAI Connector, you need to have an account at platform.openai.com and pay a fee based on the computing resources you use. However, there is a free trial available. You will find the connector under “analytics sources” when creating a new data connection.

With the connector, you can create prompts using variables, fields, or expressions from your Qlik app. A prompt is a text input that tells OpenAI what kind of response you want. For example, you can ask OpenAI to write a summary, suggest a reply, generate a question, or complete a sentence.

You can select different models to send your prompts depending on your use case. OpenAI offers several models with different capabilities and trade-offs, such as:

Davinci: The most advanced and versatile model, capable of generating high-quality and diverse responses for any prompt

Curie: A smaller and faster model than Davinci, suitable for tasks that require less creativity or complexity

Babbage: A specialized model for numerical or tabular data analysis

Ada: The smallest and cheapest model, suitable for simple tasks that require factual or straightforward responses

You can also customize other parameters of your prompts, such as:

Temperature: How creative or diverse the responses are. A higher temperature means more randomness and variety, while a lower temperature means more predictability and consistency.

Max tokens: The maximum number of tokens (words or symbols) the model can generate as a response. A higher max tokens means a longer response, while a lower max tokens means a shorter response.

Top P: The probability threshold for selecting the next token. The model will only consider the tokens with a cumulative probability of less than or equal to the top P value. A higher top P means more diversity and exploration, while a lower top P means more confidence.

Frequency penalty: How much the model avoids repeating words or phrases. A higher frequency penalty means less repetition and redundancy, while a lower frequency penalty means more repetition and emphasis.

Presence penalty: How much the model prefers using new words or phrases. A higher presence penalty means more novelty and diversity, while a lower presence penalty means more familiarity and similarity.

What are some use cases for the Qlik OpenAI Connector?

The Qlik OpenAI Connector opens a world of possibilities for using natural language in your Qlik apps. Here are some examples of how you can use it.

Summarizing public sentiment toward a product or company

You can use the connector to analyze social media posts, reviews, or feedback about a product or company and generate a summary of the main themes or sentiments. For example, you can send a prompt like “Write a summary about the reception towards ” & [Product] & ” by ” & [Company] and get a response like:

“The reception towards Product X by Company Y is mostly positive, with customers praising its quality, design, and functionality. However, some customers have complained about its high price and poor customer service.”

Suggesting responses to customer support tickets

You can use the connector to help your customer support representatives handle tickets faster and more effectively. You can send a prompt like “Suggest a response for a customer support representative for the following case: ” & [ticket_text] and get a tailored response like:

“Dear Customer,

Thank you for contacting us. We are sorry to hear that you are having trouble logging in to your account. We apologize for any inconvenience this may have caused you.

We have fixed the issue, and you should be able to log in now. Please try again and let us know if you still need any help.

Thank you for choosing our service.

Sincerely, Customer Support Team”

You can then use application automation to send this suggestion to a Teams channel or an email address.

Generating social media posts from job descriptions

You can help your Marketing department by generating social media posts. You can send a prompt like: “Write a LinkedIn post for the following job description: “ & [raw_job_description] and get a response like:

“ Are you a junior/mid-level BI consultant looking for an exciting opportunity? Pomerol Partners is hiring! We are looking for someone with a degree in Computer Science or equivalent, 2-3 years of Software Engineering experience, knowledge/experience with Microsoft Power BI, ETL processes and Data Modelling, Data Bases (Postgres, SQL Server, Oracle) and SQL. You should have functional knowledge on reporting and data analysis, an analytical mind with a problem-solving aptitude, self-motivation and commitment to deadlines, be a team player and have good verbal and written English communications skills. You will participate in technologically attractive and international projects; receive training and certifications; enjoy hybrid work; and be integrated into a young, solid, ambitious and motivated team. Send us your CV in English! #PomerolPartners #BIConsultant #JobOpportunity #DataAnalysis #ProblemSolving #TeamPlayer #HybridWork”

You can do this in the data model to store responses and create a results library.

These are just some ways you can use the Qlik OpenAI Connector to enhance your data analysis and communication. Don’t hesitate to get in touch with us if you want to learn more about this connector or see it in action.

We hope you enjoy using the Qlik OpenAI Connector and discover new insights and opportunities with OpenAI’s natural language models.

Top 5 Machine Learning Game-Changing Use Cases in Finance

Various industries, such as e-commerce, healthcare, and entertainment, have used Machine learning (ML). But what about the financial sector? How can ML benefit financial institutions and their customers right now?

Let’s explore some of the applications and use cases of ML in finance and how they can improve efficiency, accuracy, and customer satisfaction. We will also discuss some of the challenges and opportunities ML presents for the financial sector.

Applications and Use Cases of ML in Finance

ML can help financial institutions to:

- **Automate business processes and reduce operational costs.** For example, ML can process invoices, generate

reports, monitor transactions, and detect anomalies.

- **Enhance customer relations and retention.** For example, ML can create chatbots, personalize recommendations, segment customers, and predict churn.
- **Optimize trading and investment strategies.** For example, you can use ML to analyze market data, generate trading signals, and manage portfolios.
- **Detect and prevent fraud and cyberattacks.** For example, you can use ML to identify fraudulent transactions, flag suspicious activities, and protect sensitive data.
- **Comply with regulations and manage risks.** For example, you can use ML to monitor compliance, assess creditworthiness, calculate capital requirements, and optimize risk management.

Some of the use cases of ML in finance that are expected to grow in 2024 are:

- **Algorithmic trading:** Using algorithms to make trading decisions based on defined boundaries and specifications. ML can help to improve the performance and efficiency of algorithmic trading by adapting to changing market conditions and learning from historical data.
- **Fraud detection and prevention:** Identifying and preventing fraudulent activities and cyberattacks. ML can help to detect and prevent fraud by analyzing large volumes of data, finding patterns and anomalies, and alerting the authorities.
- **Portfolio management and robo-advisory:** Managing and optimizing investment portfolios and financial advice. ML can help provide portfolio management and robo-advisory services by analyzing the risk and return profiles of different assets, creating optimal asset allocations, and offering personalized recommendations.
- **Credit scoring and lending:** The evaluation and provision of credit and loans. ML can help improve credit scoring

and lending by using alternative data sources, such as social media, online behavior, and transaction history, to assess borrowers' creditworthiness and default risk.

Challenges and Opportunities of ML in Finance

While ML offers many benefits for the financial sector, it also poses some challenges and risks that must be addressed. Some of the challenges and opportunities of ML in finance are:

- **Data quality and availability:** The quality and availability of data are essential for the success of ML applications. However, data can be incomplete, inaccurate, outdated, or biased, affecting the reliability and validity of ML models. Therefore, financial institutions must ensure that they have access to high-quality and relevant data and follow ethical and legal standards for data collection, storage, and use.
- **Explainability and interpretability:** The explainability and interpretability of ML models are essential for the transparency and accountability of ML applications. However, some ML models, such as deep neural networks, can be complex and opaque, making it difficult to understand how they work and why they make certain decisions. Therefore, financial institutions must develop methods and tools to explain and interpret their ML models and communicate their results and implications to stakeholders and regulators.
- **Regulation and governance:** The regulation and control of ML applications are essential for the safety and security of ML applications. However, the current regulatory framework for ML in finance may not be sufficient or consistent, creating uncertainty and inconsistency for financial institutions and their customers. Therefore, financial institutions must collaborate with regulators and policymakers to develop and implement clear and coherent rules and standards for ML in finance and monitor and audit their ML

applications regularly.

Conclusion

Machine learning is a powerful and promising technology that can transform the financial sector. ML can help financial institutions automate business processes, enhance customer relations, optimize trading and investment strategies, detect and prevent fraud and cyberattacks, comply with regulations, and manage risks. However, ML also presents challenges and risks that need to be addressed, such as data quality and availability, explainability and interpretability, and regulation and governance. Therefore, financial institutions need to adopt a strategic and responsible approach to ML to leverage the opportunities and overcome the challenges that ML offers.

Smart Chicken's Inspiring Success: Leading the Way in BI and Analytics

Tecumseh Poultry was founded in 1998 based on a simple goal, "to produce the best fresh chicken in the United States", and that's what they do! Over 20 years they have defined and then implemented methods which result in the highest quality finished products. In other words, they do things the right way. Not necessarily the easiest, fastest or most efficient way. Simply the right way.

So, what exactly does this mean? Proper treatment and care of

their chickens and people, and the utmost care and discretion in how they process and package their product. Furthermore, they do all this while keeping a careful eye on the environment and on the sustainability and renewability of the resources they rely on.

Beyond being industry innovators in their day to day operations, they're also 10 steps ahead when it comes to how they analyze their business and are visionary in how they use data to identify opportunity for improvement. In fact, Smart Chicken has more advanced predictive analytics than many investment banks we've worked with. Recognizing this vision early on, Pomerol was very excited to be given the opportunity to help Smart Chicken take their BI and analytics to the next level.

> *"Smart Chicken has more advanced predictive analytics than many investment banks"*

No shortage of business challenges….

There are many challenges unique to producing a perishable fresh product. The shelf life is short, high wastage would make the business model unfeasible, and there's no real opportunity for inventory. So, supply and demand need to be in sync, and this requires precision planning and a perfect understanding of your market. Supply is relatively fixed in the short term, but demand can fluctuate wildly depending on time of year, weather and promotional activities. Believe it or not, demand for white breast meat skyrockets for the short period of time that our new year's resolutions are still intact, before settling back down in February. Try planning around that!

Beyond this, there are a raft of challenges unique to poultry production. Football season sees a huge uptick in wings consumption, but last time we checked, a chicken only has two wings, so there's no ability to increase production of this

single SKU. In another twist, Thanksgiving and Christmas is a time of year where we all get together and eat whole Turkey, but that sees the demand for whole chickens plummet for November and December. Planning around these erratic peaks and troughs causes plenty of pain, but together with the Smart Chicken team we've developed some novel ways of optimizing the planning process through a combination of live analytics in Qlik dashboards, and machine learning assisted forecasting with Data Robot.

Using Qlik to shed light on the business

The power of Qlik is leveraged for both its ETL capabilities and as a data visualization and reporting platform. Powerful associative models consolidate data from ERP, CRM, live production and planning tools giving managers an asset to empower decision making.

The customer demand forecasting process is a critical step in the chain to running a successful operation. Visualizing the forecast in Qlik, managers can quickly move from a brand level right down to individual SKUs. Different ordering patterns unique to geographies are easy to see, and the demand fluctuations driven by weather, events, promotions and holidays are all evident when trended or exposed through geographic maps.

Qlik provides a great view into the forecasting and sales data, but with such diverse ordering patterns there's real opportunity in perfecting the forecasting process right down to the SKU and customer level. Smart Chicken and Pomerol enlisted the help of Data Robot to apply Automated Machine Learning technology to the demand forecasting process.

Taking forecasting to the next level with Data Robot and Automated Machine Learning

What really separates Smart Chicken apart from their competitors is how tight their forecasting and planning process is. Representatives in the field have their finger on the pulse by chatting to customers in supermarkets and they feed anecdotal information back into the planning team, while back at head office demand is forecast right down to the SKU and customer level, something most companies would not dare attempt.

Instead of applying a single forecasting algorithm across all customers and SKUs, Data Robot has enabled Smart Chicken to mathematically cluster and segment similar customers and products based on volume and ordering behaviors. Unique forecasting models are then auto-generated for each unique cluster.

Pulling from a library of hundreds of predictive models, Data Robot ranks its recommended models based on performance, error and speed, and then recommends a model to be put into production. Without an in-house data science team, Smart Chicken uses the power of automated machine learning and predictive analytics to further refine customer demand forecasting.

Beyond demand forecasting

While customer demand is a pivotal data point for Smart Chicken, there are other parts of the business that can also benefit from the power of Data Robot. Predicting the growth trajectory and final weight of chickens can inform the planning process of anticipated supply. In a sector where inventory is almost non-existent, having a keen eye on supply avoids surprises and lets the customer support team know exactly how much produce they have available to distribute. Having advance notice of any expected shortfalls lets customer

service pro-actively manage expectations.

In another industry first, Smart Chicken have installed a full end-to-end ‘air chill’ system – the only one of its kind in the US. While the impact this has on product quality is beyond measure, it’s a tricky piece of equipment to run and presents a risk should it fail. Smart Chicken are looking to Data Robot for predictive maintenance. By analyzing the events leading up to previous parts failures, we can begin to predict when another failure is looking likely. IOT sensors constantly measure conveyor belt motor amperage, temperature and tension. The most minute change in tension may indicate a stressed or worn ball-bearing, or a slight increase in motor temperature might indicate an increased level of strain. Being able to pro-actively identify issues before they fail during production hours can have a massive impact on continuity of supply.

Looking to the future

As consumers place a higher importance on the quality and origin of their produce, the market for Smart Chicken’s products is on the rise. The game-changing innovator from small-town Nebraska is setting the bar for the larger producers. We’re excited to be on the analytics journey with them!

Visit the Smart Chicken website: https://www.smartchicken.com