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AI in banking

AI is at the center of innovation in financial services. Recent implementations have brought automatic facial recognition, video KYC processes, fraud detection, algorithmic trading, and robo-advisors to banking.

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It is no secret that Artificial Intelligence (AI) lies at the center of banking innovation. This combination of advanced computational technologies in varying degrees of maturity [1] is a valuable asset providing solutions through pattern recognition, prediction and autonomous learning abilities.
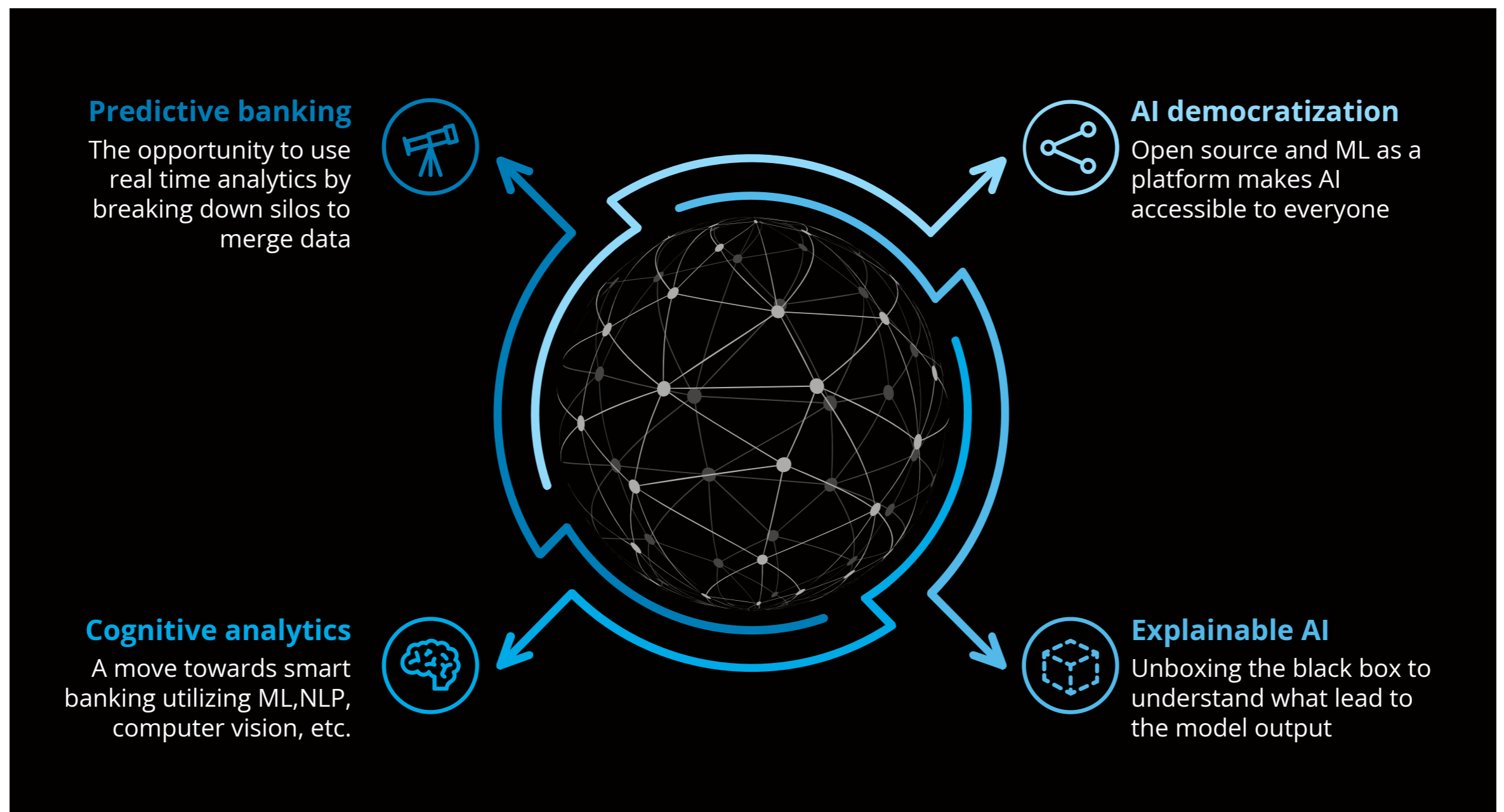
The banking sector is currently focusing on enhancing their customer experience while improving its cost income ratio, implementing innovation projects to reach these objectives. As AI initiatives differ across business lines, analytics teams should align strategic priorities before implementation.

The question that comes to mind is where to start? AI is part of an innovation cycle. Deloitte recommends to start small without reinventing the wheel. Identify possible quick wins that are easy to implement and does not require too much upfront investment in technology. Follow the motto "start small and fail fast", an iterative agile approach is the way to go to achieve successful AI implementation.

A few AI developments that changed the industry include automatic facial recognition, video KYC processes, fraud detection, algorithmic trading, and robo-advisors [2]. Let's zoom in on the topics that are the most discussed around AI in Banking.

What are the hot topics on the banking radar?

AI is in the banking limelight. Current hot topics include predictive banking, AI democratization, cognitive analytics, and explainable AI. Keeping an eye on AI trends assists in defining innovation ambitions and forming technology strategies.

Predictive banking
The opportunity to use real time analytics by breaking down silos to merge data

AI democratization
Open source and ML as a platform makes AI accessible to everyone

Cognitive analytics
A move towards smart banking utilizing ML,NLP, computer vision, etc.

Explainable AI
Unboxing the black box to understand what lead to the model output

Predictive banking uses real time analytics to consolidate internal and external data, Predictive customer profiling allows banks to use existing data to add customer specific value. Robo-advisors can find the best individual solutions in real time. Breaking down silos and merging data allow banks to have better insights and give real-time personalized advice [11].

AI democratization aims to make AI accessible to everyone [2]. Machine Learning as a Service (MLaaS) is an industry trend, encouraging model implementation using open source platforms. The banking industry could join this culture of sharing by implementing open source AI solutions. Building chat-bots with open-source NLP libraries can play a vital role in customer.
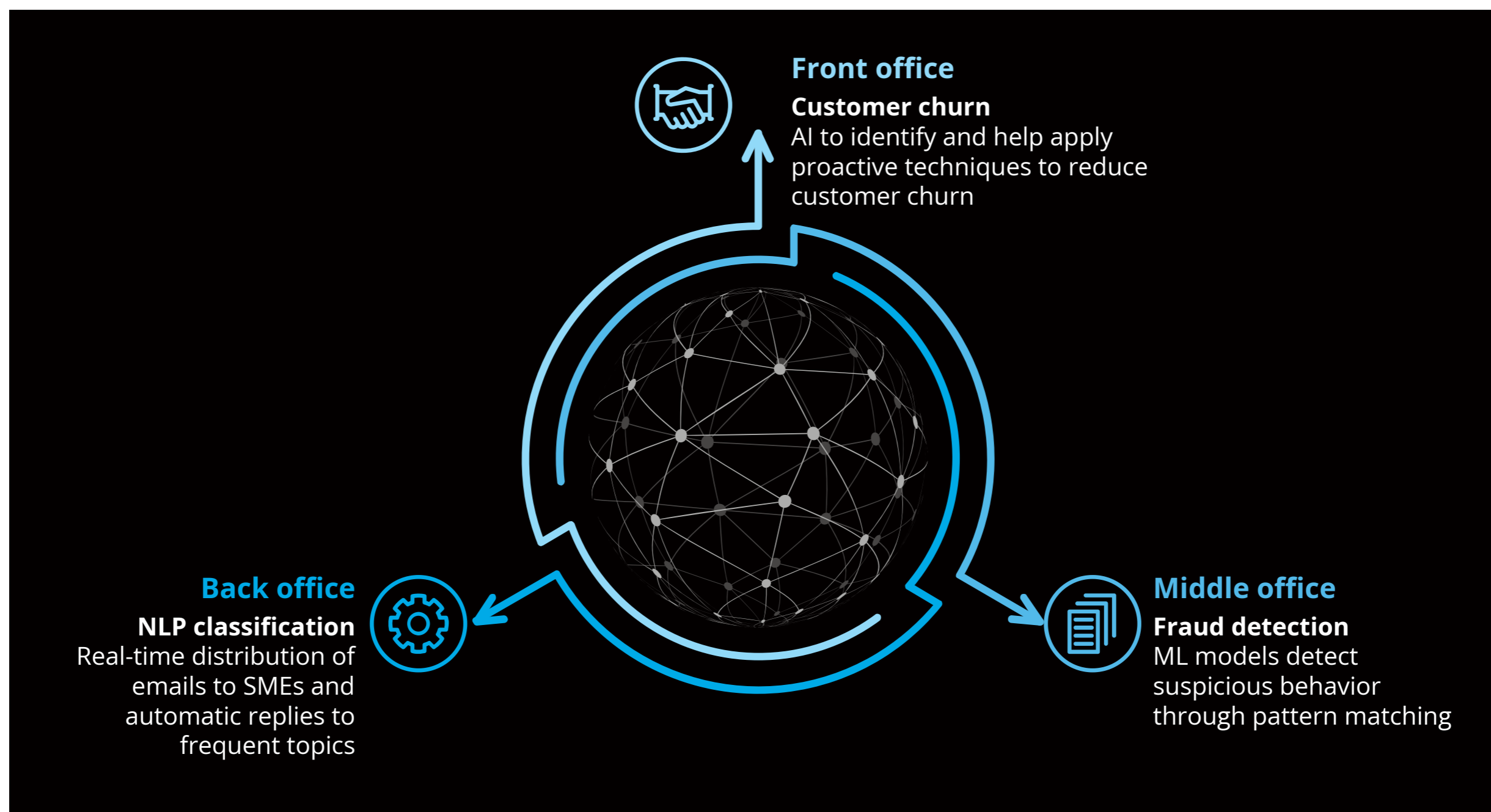
Cognitive Analytics (deep learning, computer vision, etc.) is inspired by the human brain's ability to process

information, draw conclusions, and learn [10]. This is paving the way towards smart bankingthrough threat detection, optimization engines, and advanced credit scoring models [4]. Smart banking will embrace cognitive opportunities to detect patterns and build a deeper understanding of the market dynamics.

Explainable AI and unboxing the AI black box is a trending topic. This is driven by regulation, risk aversion, and the demand to reduce model bias. By law, individuals affected by AI decision can request how that decision was reached [8]. Commonly more accurate ML models are more complex and harder to interpret. Deloitte developed GlassBox, a toolkit that validates AI models and exposes possible bias [9]. Academic research and AI governance discussions emphasize that this transparency trend will help financial institutions to quantify model risk and sensitivity more accurately [12].

How to implement AI in banking – getting practical

The Deloitte Analytics Catalogue has multiple AI use cases across the financial industry. Keeping industry trends in mind, we selected a practical use case within the front office, middle office, and back office to illustrate AI's impact on banking.

Front office
Customer churn
AI to identify and help apply proactive techniques to reduce customer churn

Middle office
Fraud detection
ML models detect suspicious behavior through pattern matching

Back office
NLP classification
Real-time distribution of emails to SMEs and automatic replies to frequent topics

NLP classification: AI to improve customer service

Natural Language Processing (NLP) is a branch of AI concerned with interactions between computers and human language. Deloitte offers various NLP solutions, with classification being a quick win due to the high potential impact across the banking value chain [7].

Input to our NLP classification model can vary from structured or unstructured documents, to emails, scanned files or voice data transformed to text. Multiple language inputs go through the classification process that includes NLP techniques such as language detection, removing stop-words, vectorization to transform text and model evaluation. The output classifies each input into a different topic or cluster.

Using this tool within customer services can have a significant impact. Incoming emails can be analyzed and automatically forwarded to an employee with subject matter expertise in the detected topic, saving time and increasing client satisfaction. Additionally, automatic replies can be sent to frequently received requests detected by the NLP analysis. This reduces the workload and allows time for more complex queries to be solved by human intervention.

Fraud detection: AI to spot the needle in a haystack

Fraudulent transactions are difficult to identify amongst the ocean of operations in banking systems. Despite their small proportion [15], there is a huge work of middle office team in terms of investigation to detect them. Identifying these transactions is critical, as fraudulent transactions can lead to huge financial costs and reputational consequences.

Currently, most of the monitoring mechanisms regarding fraud are rule-based. When a certain threshold is exceeded or a recurrence is identified, the transaction is marked for further investigation. To obtain better results, AI techniques

can be used to spot very rare events. Anomaly detection algorithms are tailor-made to detect fraudulent transactions by isolating exceptional items on the basis of variables known to the model.

The input from both compliance and business teams is essential to implement this use case. As the number of payment channels and fraud types increase, the definition of the type of events the AI algorithm should recognize should be the starting point of any analysis.

Customer churn analysis: AI to prevent losing valuable customers

Acquiring a new customer is more expensive than retaining an old one. Increased competition in banking comes from existing players increasing their service offering or new innovative players entering the market. Furthermore, the right to data portability makes it easier to transfer data when switching banks–adding to the value of a customer churn analysis [8].

Benefiting from available data, AI models, including different supervised learning techniques with feature engineering or survival analysis can produce insights on customer churn [13]. This will help identify significant variables affecting customer churn, such as fees, rates, branch locations, product offerings, account types, online service usage, etc. Certain early warning signs, like a recent decrease of assets or a higher average number of customer service calls can also be indicative.

Gaining knowledge of these high-probability-to-churn variables and being aware of early warning signs should be imbedded into proactive strategies together with identifying beneficial timing for implementation. Such an alerting system, indicating possible churn warnings and when to act, will improve customer retention.

Opportunities in risks

AI developments are changing business-as-we-know-it. In a fast-evolving field, implementation includes various risks and uncertainties. Three main risk categories are identified as talent availability, ethical concerns, and technological considerations.

Talent availability

To implement AI effectively, both banking knowledge and AI skills are necessary. AI skills are needed within the industry to implement, supervise, interpret and maintain the solutions, together with industry knowledge to assure that the implementation is relevant to business needs [2]. A general skill shortage makes finding the appropriate talent difficult. An organization should value talent and turn this risk into an opportunity by promoting a culture of change. Clear communication of the role of AI in the organization could reduce the fear of AI taking over the human role in a company and foster better understanding of the need for interconnectedness between business and technical skills.

Ethical concerns

Ethical concerns include the lack of data protection, privacy, transparency and fairness within AI models. It is important to ensure a regulatory environment that promotes ethical AI innovation. Ethics standards should be technology neutral and be implemented as part of the AI design [14]. Being aware of ethical concerns implementing ethics-by-design will lead to future opportunities. Consumers will not only trust the outputs, but transparent AI also leads to less biased models and more interpretable results.

Technological considerations

As AI gains broader usage, new technical concerns will arise. Companies lacking the necessary internal skills, must ensure the availability of external consultancies with the capacity to maintain off-the-shelf packages. Within AI outsourcing, sufficient customizability must be considered, to avoid purchasing a solution that does not fit the business needs [14]. To prevent security attacks, appropriate defense techniques resulting in robustness should be put in place. Furthermore, the predictive power of a model is limited to learning from past observations.

Institutions should update models regularly and think innovatively to prepare for extreme scenarios that lies outside the scope of the ML model predictions [2]. Being aware of technological risks allows companies to mitigate them strategically and have competitive advantage in the industry.

AI has the potential to change the banking industry, but risks should be considered and the banking specific landscape, skillset and needs should be evaluated before implementation.

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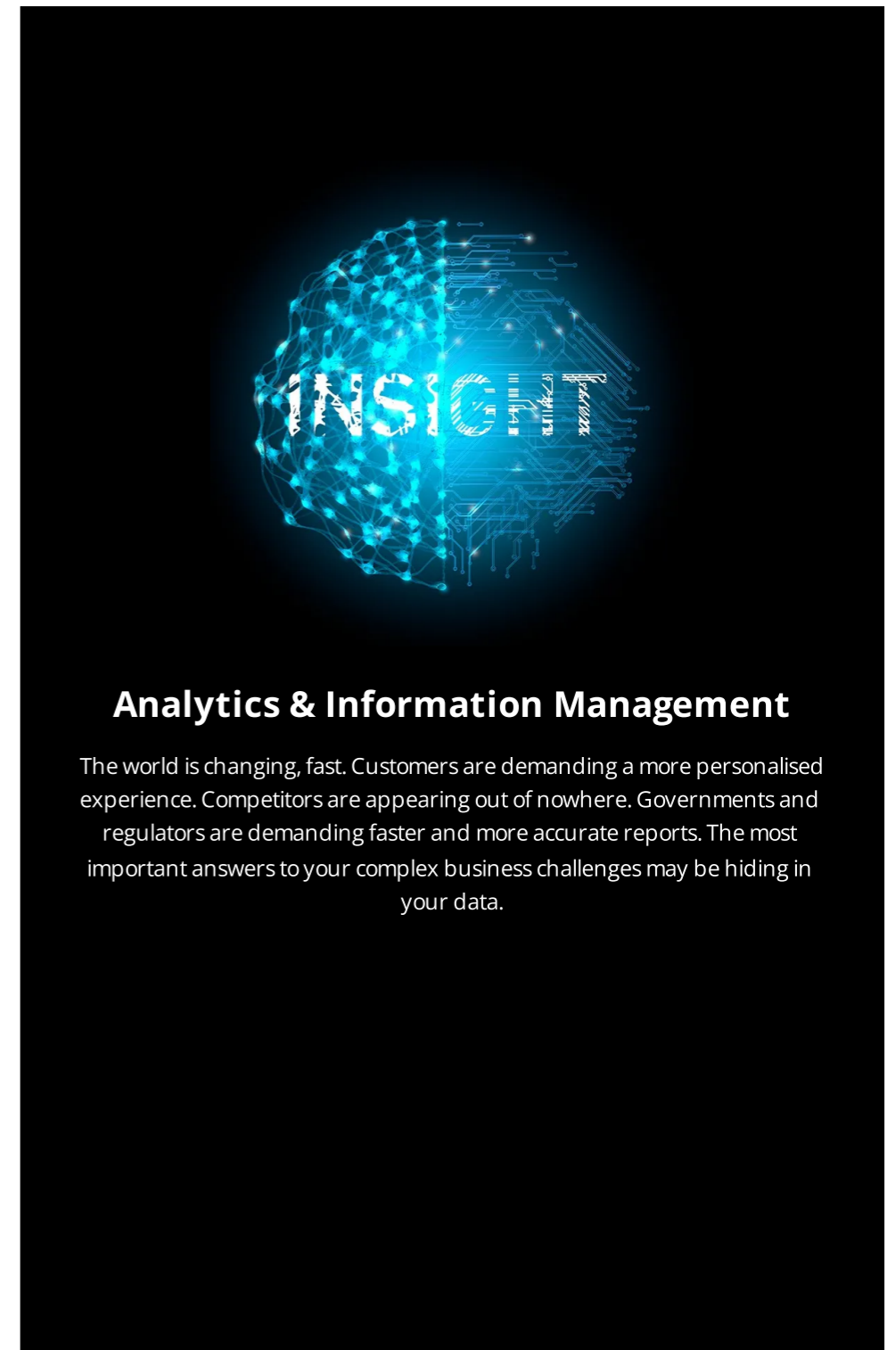
Conclusion

The integration of AI in the banking sector adds value to operations and services. Current trends include predictive banking, AI democratization, cognitive analytics and explainable AI. Banks should take advantage of available data by breaking down silos' for real-time analysis through predictive banking. A shift towards open source allows banks to leverage from more compatible and collaborative platforms. The importance of embedding transparency in AI models is good practice not only for less biased models and more interpretable results, but also to align with regulatory constraints. Furthermore, cognitive analytics paves the way towards smart banking that includes automatic facial recognition, video KYC processes and other implementations.

AI is visible throughout the banking industry. Zooming in on NLP classification, fraud detection and customer churn analysis show how AI can make a positive impact across the back, middle and front office operations. NLP classification can improve customer services through routing emails to subject matter experts and sending automatic replies to frequent queries. For middle office efficiency, fraud detection AI effectively flags very rare events. Churn analysis can increase customer retention through implementation of actionable AI insights.

The top three AI implementation risks can be categorized as talent availability, ethical concerns and technological considerations. AI has the potential to change the banking industry, but the risks, banking landscape, skillset, and needs must be considered in order to seize AI opportunities. Start small by identifying quick win use cases and aligning strategic priorities before implementation. AI has the potential to change banking-as-we-know-it. Take a step towards AI implementation today.

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