



White paper

# Beyond defaults: Next-gen early warning system in the new era

## Abstract



**Background**—Early warning signals and qualitative triggers

**Problem statement**—Qualitative data triggers

**Trends**—Innovative external source trends

**Inferences**—Proactive and a multifaceted approach to preemptively predict client's behavior

**Solution**—Gen AI helps banks/FIs to redefine their dynamic risk monitoring system

**Conclusion**—Proactive approach to empower banking institutions to implement risk mitigation measures earlier and more efficiently

## Early warning signals and qualitative triggers

The banking industry is increasingly recognizing the importance of early warning signals (EWS) as a proactive approach to risk management. These signals, which are influenced by both quantitative and qualitative triggers, play a crucial role in identifying potential risks and enabling the implementation of preventive measures.

The qualitative triggers are significant and may be impacted as below:

### (i) Regulatory expectations

These expectations encourage banks to utilize forward-looking data and a diverse set of indicators within their EWS, fostering a proactive approach to risk mitigation.

### (ii) Geopolitical upheavals or publicly available news

The monitoring and analysis of publicly available news about borrower and industry-specific performances including geopolitical events that could impact the financial landscape along with unstructured data available in this area. The insights gained from this analysis assist lenders in making informed and timely decisions.

### (iii) Industry indicators

The various industry indicators such as the industrial growth rate, industry regulations, ability to control costs, rising input prices and emerging customer behaviors are also analyzed to gauge their impact on EWS triggers.

# Enhanced market data collection and structuring for early warning systems in banking

Traditional early warning systems rely heavily on quantitative data like earnings reports and credit ratings. However, these systems can be enhanced to collect and collate qualitative information (economic, geopolitical and social trends that significantly impact borrowers' financial stability) for rapid analysis and results.

Integrating broader qualitative data in EWS is essential for modern, more accurate risk assessment and management.

## Qualitative data challenges for EWS



**Inflation:** Rising inflation affects purchasing power and default rates; real-time economic indicators are needed.



**Political climate:** Instability and global events increase risk; EWS should integrate geopolitical data.



**Environmental risks:** Climate change impacts vulnerable industries; include sustainability metrics.



**Social media:** Public sentiment influences markets; analyze social media for emerging risks.



**Market trends:** Financial market volatility signals economic shifts; monitor and analyze market data.



## Trends



### **Proactive and forward-looking approaches:**

Regulatory bodies like the European Banking Authority (EBA) and the UK Prudential Regulation Authority (PRA) are urging banks to adopt proactive, forward-looking EWS. These systems should regularly evaluate both quantitative and qualitative indicators, supported by robust IT and data infrastructures.



**Technological advancements:** The advent of big data and advanced analytics is crucial for the next generation of EWS. Banks are moving from static, backward-looking models to dynamic, data-driven systems that continuously update and refine risk indicators. Predictive models and machine learning algorithms play a significant role in identifying early signs of financial distress, reducing false positives and improving decision-making processes.



**Diverse data sources:** Modern EWS is leveraging a broader range of data sources beyond traditional financial metrics. This includes news sentiment analysis, environmental, social and governance (ESG) metrics, and alternative data such as web traffic and Google Trends. Combining these with internal bank data enhances the monitoring of credit risk, particularly for small and medium-sized enterprises (SMEs) and private companies.



### **Enhanced user interfaces and**

**governance:** Modern EWS also focuses on user experience (UX) and interface design, enabling real-time monitoring and more intuitive data visualization. This shift allows credit officers to act swiftly on insights derived from comprehensive data analysis. Additionally, continuous model management and governance are essential to ensure the systems remain effective and relevant amid changing market conditions.

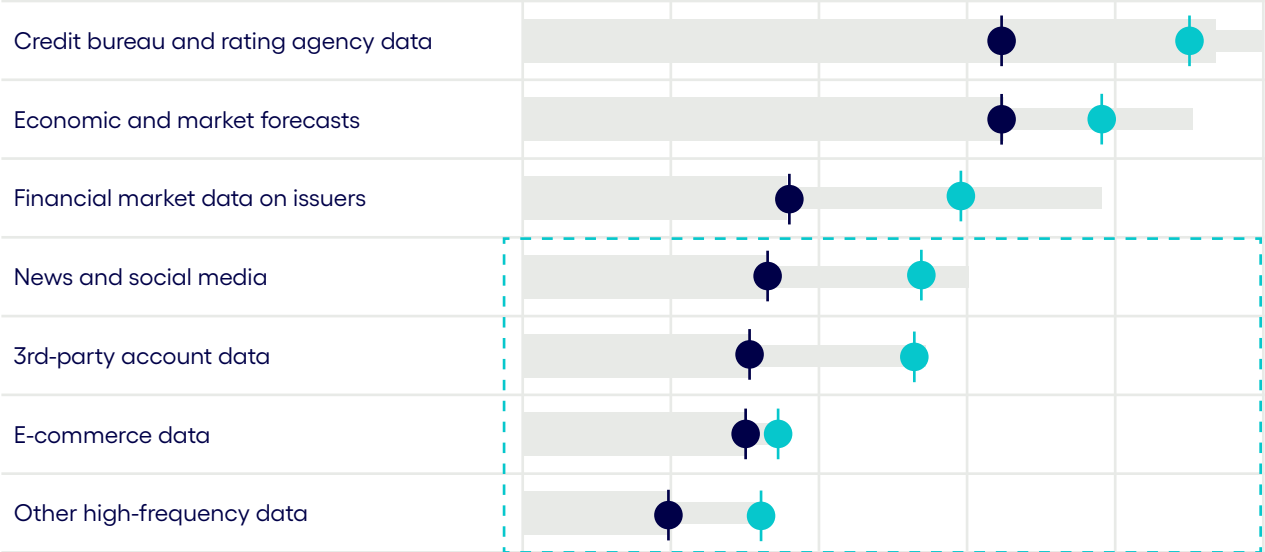
# Trends

Companies tend to use external innovative data sources for credit analysis in corporate segments and internal ones in small and medium-size enterprises.

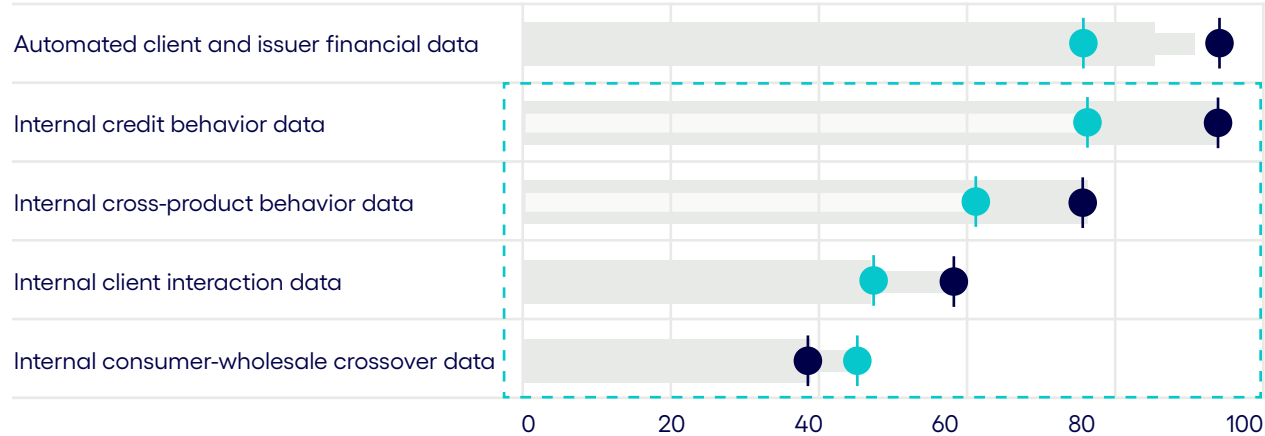
Financial company use of data sources for credit portfolio management, % of respondents (n = 44)

● Small and medium-size enterprises ● Corporate [ ] Innovative data sources

## External data sources



## Internal data sources



‘Question: Which of the following categories of data are being used in production, under pilot, or under consideration for credit-risk-management use cases within the corporate and the small and medium-size enterprise portfolios?’

Source: IACPM and McKinsey Survey on Data and Analytics Innovations in Credit Portfolio Management, Q4 2021/Q1

# Inferences

A more proactive, intelligent and multifaceted approach is required to preemptively predict client's behavior and ability to fulfil its obligations to the financial institution.



**Improved risk prediction accuracy:** Enhanced data collection from diverse qualitative sources such as social media, political climate reports and environmental risk assessments can significantly improve the accuracy of risk predictions. This allows banks to anticipate potential defaults or financial instability more effectively.



**Timely interventions:** With real-time data on inflation, market trends and social sentiment, banks can implement timely interventions to mitigate risks. Early detection of adverse economic indicators can lead to proactive measures, reducing the impact of potential crises.



**Holistic risk management:** Integrating qualitative data leads to a more comprehensive understanding of risk factors. This holistic approach enables banks to consider a wider array of influences on borrowers' financial stability, beyond traditional financial metrics.



**Enhanced decision-making:** Decision-makers in banks can benefit from a richer dataset that includes geopolitical and environmental insights. This leads to more informed and strategic decisions regarding lending, investment and risk management policies.



**Competitive advantage:** Banks that leverage enhanced market data collection for their EWS can gain a competitive edge. They can offer better terms to clients deemed lower risk due to more accurate assessments, thus attracting more business and enhancing profitability.



**Adapting to market changes:** A dynamic approach to data collection helps banks stay agile in the face of changing market conditions. Continuous monitoring and analysis of new data sources allow for rapid adaptation to economic shifts and emerging risks.



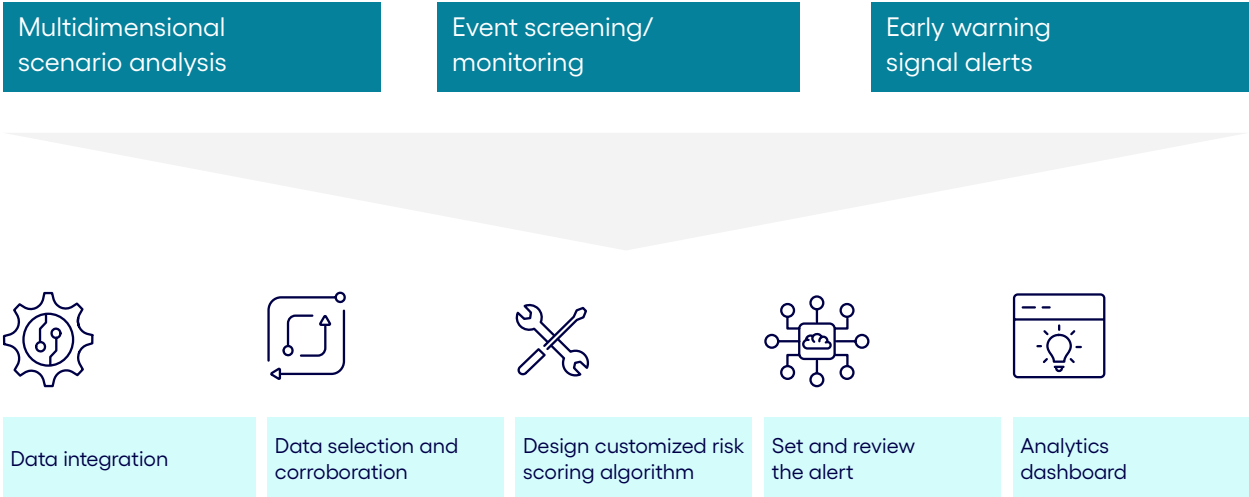
**Customer relationship management:** Understanding the qualitative aspects of market data can improve customer relationship management. By anticipating clients' financial challenges, banks can offer tailored solutions and support, strengthening customer loyalty and trust.



**Innovation in financial products:** Insights from enhanced data collection can drive innovation in financial products. Banks can develop new services that cater to emerging needs identified through qualitative data analysis, such as green financing options responding to environmental risks.

# Solution landscape

## Gen AI helps banks/FIs to redefine their dynamic risk monitoring system



### Gen AI business solutions and offerings

**Step 1: Automatic ingestion of financial, qualitative and market data from different sources**

At the outset, our solution will gather a large collection of relevant data from various unstructured sources (both internal and external) of bank’s customers. These sources encompass performance reviews, operational records (such as agent notes, call transcripts and chatbot information), and external resources like industry reports, financial news and social media. The relevant data will be filtered based on user-defined search parameters, and we can collect this unstructured data from multiple sources using methods like custom web crawling, bots and APIs, text extractors and social media scrapping.

**Step 2: An algorithmic template approach to transform data from unstructured to structured datasets**

The consolidated unstructured data can structure and ready for analysis using document structuring and clustering technique. Automated data quality detection and correction of transformed data for anomalies, gaps and errors can be tackled with AI using NLP (natural language processing) capabilities.

A machine learning-driven model with robust methodology can build and train against these corpora of input data to convert unstructured data into structured data.

How AI tool works: 1) Advanced analysis; 2) ML model outcome.

### **Step 3: Data analysis and labelingsources**

1. Data digitization and storage: The process begins with the digitization of structured data. This data is then stored in a centralized, cloud-based data repository, commonly referred to as a data warehouse.
2. Impact analysis at multiple layers: An advanced analytics algorithm is employed to perform an automated impact analysis at three distinct levels:
  - Industry level: This level identifies industries that are heavily impacted and those that are less impacted. For instance, industries such as oil and refinery, energy, supply chain and logistics are primarily impacted, while agriculture, food processing and bio-reusable energy are considered to be secondary or less impacted.
  - Portfolio level: At this level, the system assesses the hit rate of the bank's existing portfolios. For example, the corporate portfolio has a higher hit rate than the agriculture portfolio.
  - Account level (for specific customers): The system further investigates the bank's customer base within each portfolio. It assigns a tailored score to each customer using a scoring algorithm.
3. Scoring mechanism: The system assigns impact scores to each customer based on a set of predefined rules.

### **Step 4: Data monitoring watchlist and model inputs**

Upon processing a variety of data input streams, the AI model generates multiple data points. These data points are designed to be integrated into the client's existing early warning system (EWS) risk engine. In addition, the model provides an overview of the bank's existing customers, assigning each a relative impact score. This score is used to segregate customers into three distinct categories:

Green list: This list includes customers who pose a low to no risk of becoming delinquent

Orange list: Customers on this list have a medium to low risk of delinquency

Red list: This list comprises customers with a high to medium risk of becoming delinquent

This system allows for efficient monitoring and management of potential risks associated with customer delinquency.

### **Step 5: Data analytics dashboard and tailor-made recommendations**

Our solution is integrated with a well-designed, data-driven dashboard that enhances the bank's existing EWS efficacy by providing information such as:

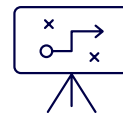
Industry trends—Showing visual representation of the overall future financial health of different industries and highlighting industries where financial distress is possible

Portfolio overview—This has a visual representation showing the proportion of the portfolio that each industry represents, which can lead to financial stress

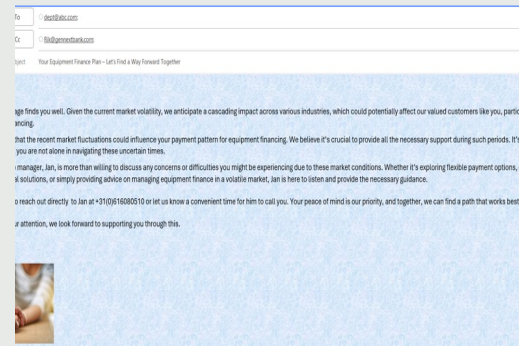
Client insights—Shows the list of clients who can be predicted to experience financial distress, sorted by industry, resulting from the information obtained on the qualitative factors contributing to this prediction



# Solution: Our value proposition



## Dashboard and personalized interaction



# An example of how gen AI engages in personalized interactions with clients and provides tailored recommendations based on detailed analysis

Send To  dept@abc.com;

Cc  Rik@gennextbank.com;

Subject: Your Equipment Finance Plan - Let's Find a Way Forward Together No Label ▾

**Dear ABC Ltd.**

I hope this message finds you well. Given the current market volatility, we anticipate a cascading impact across various industries, which could potentially affect our valued customers like you, particularly in terms of equipment financing.

We've observed that the recent market fluctuations could influence your payment pattern for equipment financing. We believe it's crucial to provide all the necessary support during such periods. It's important for us to ensure that you are not alone in navigating these uncertain times.

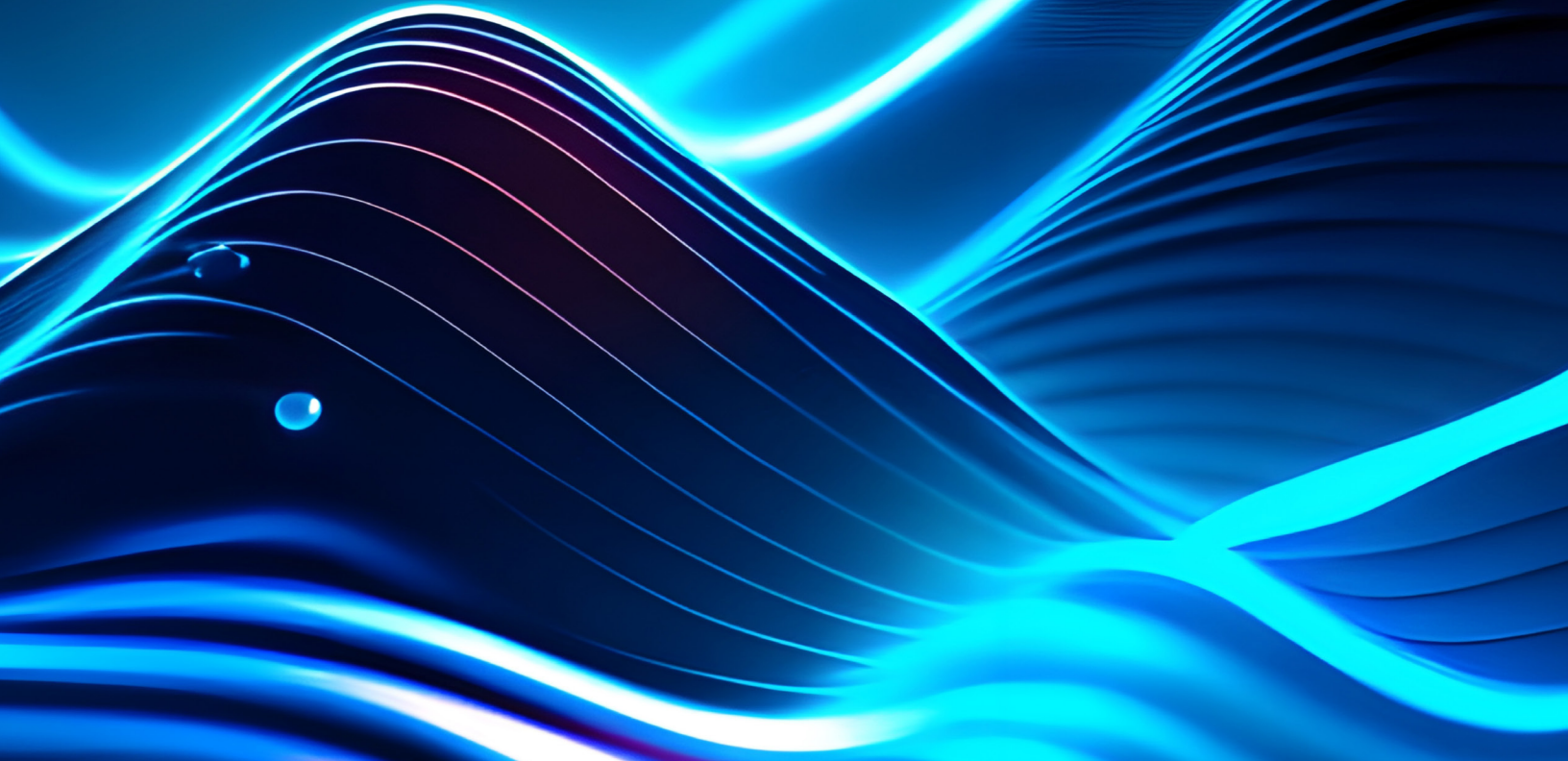
Your relationship manager, Jan, is more than willing to discuss any concerns or difficulties you might be experiencing due to these market conditions. Whether it's exploring flexible payment options, discussing potential financial solutions, or simply providing advice on managing equipment finance in a volatile market, Jan is here to listen and provide the necessary guidance.

Please feel free to reach out directly to Jan at +31(0)616080510 or let us know a convenient time for him to call you. Your peace of mind is our priority, and together, we can find a path that works best for you.

Thank you for your attention, we look forward to supporting you through this.

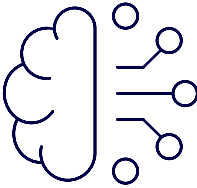
Warm regards,

GenNext Bank



## Conclusion

Early warning signals in banks are crucial for identifying potential risks and stress in financial institutions before they escalate into larger issues. An effective EWS monitors a range of qualitative, quantitative and market indicators to anticipate and quantify risks. Traditional models, which predominantly rely on rule-based monitoring on quantitative data, often overlook the critical qualitative factors that can significantly influence borrowers' risk trajectory. As a result, banks often tend to react rather than proactively plan.



The integration of AI offers a transformative approach to analyze the diverse data sources. By leveraging AI's capabilities, banks can develop more nuanced and predictive early warning systems that go beyond conventional metrics. This modern approach not only enhances risk management but also empowers banks to make more informed decisions, ultimately contributing to greater financial stability and resilience.

As the financial environment continues to evolve, adopting such advanced methodologies will be crucial. Embracing this innovative model which could seamlessly integrate with existing EWS model architecture can position banks at the forefront of risk management, ensuring they are better equipped to anticipate and respond to potential challenges. The future of banking risk assessment lies in the intelligent fusion of quantitative and qualitative data, driven by the power of AI.



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