

An AI-Driven Solution to Digitize Credit Risk

Transforming credit risk management workflows, from customer journey to servicing

Artificial intelligence and digitization transform credit risk management from the customer journey to risk assessments, policy development, and operational workflows. As part of a comprehensive digital risk strategy for large financial institutions, Daric Connect is proven to help credit officers preserve and grow customer relationships, improve risk assessment methodologies, and implement time and cost efficiencies in their operations.

The Data-Driven Customer Experience

As banks seek to differentiate the customer journey, back-end efficiencies created by Daric Connect remove bottlenecks that result from manual processes, data quality issues, and file completion delays. This enables fast and effective delivery of approvals, documents, and pricing. Daric's proprietary AI-driven technology improves data quality, creates REST-compatible extraction services across data environments, and maintains dependencies in a graphical format, while back-office documents and collateral management are integrated into an OCR-driven process for structured analysis.

Decisioning and Strategy Development

Decision-making requires integration of analysis tools into legacy systems and the operational workflow for credit risk. The decision layer incorporates policy data, appetite limits, and other scenario-specific information to transform model data into actionable recommendations, predictions, and decisions. The tool consistently "learns" from both internal and external feedback.

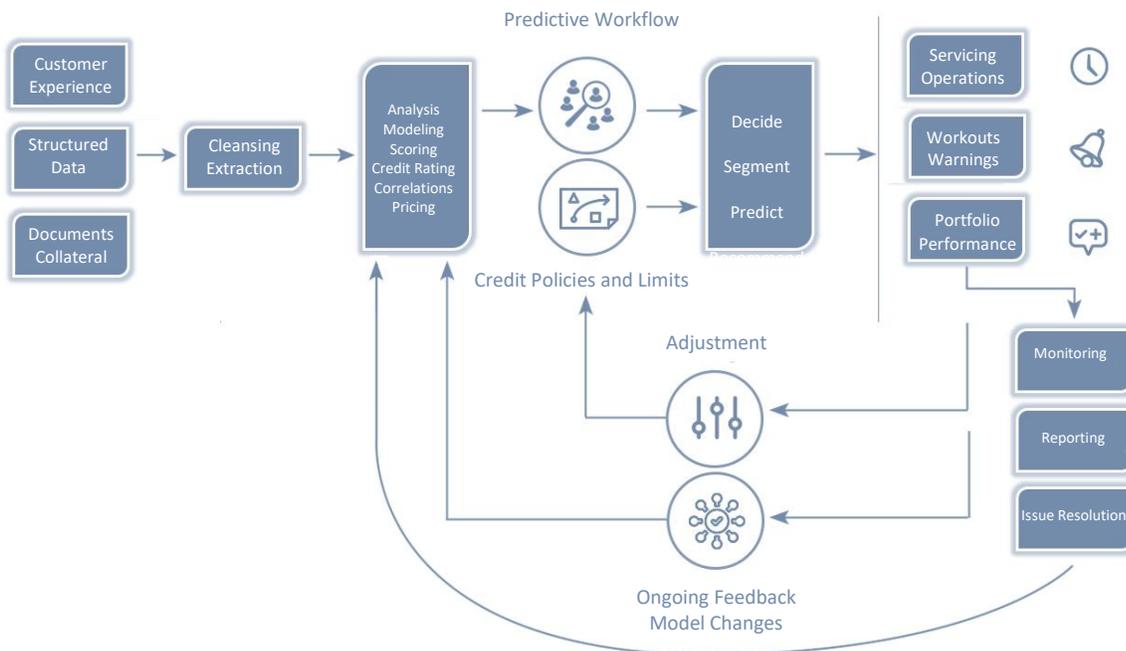
Analysis and Modeling

Once the appropriate data sources are integrated into the credit risk workflow, the AI engine integrates a powerful back-end modeling and analysis platform to better understand relationships between factors that affect a target metric or a particular question to be answered (What is the likelihood of charge-off? What is the best action to remediate an early delinquency given a set of customer attributes?). AI-driven predictions, sensitivity analysis for specific features, and other strategy information are communicated through a graph visualizer, which helps to corroborate or adjust analyst conclusions.

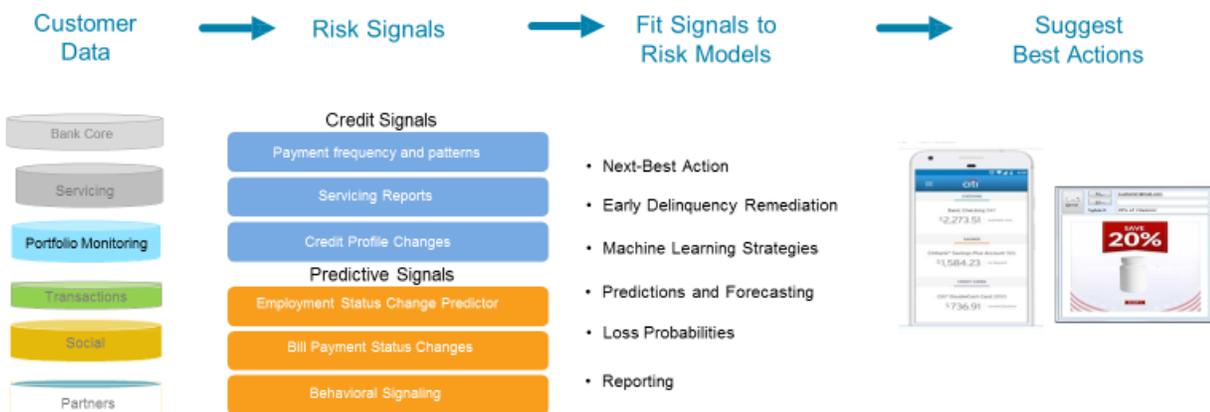
Act, Recommend and Justify

A digital solution to enable integration of outputs into operational workflows enables clients to monitor portfolio performance, adjust policies, issue early warnings, escalate specific files to restructuring or collections, and otherwise put recommendations into effect. Robust reporting and digital compliance tools turn algorithmic risk management from a "black box" into a powerful tool in regulatory environments.

SOLUTION OVERVIEW



EARLY DELINQUENCY MONITORING EXAMPLE



Case Study: Understanding the Impact

Early Delinquency Management (EDM), often defined as actions taken to restore an account to “current” status after the client is between thirty to ninety days behind on payments, is crucial to mitigating delinquency-driven losses and the possibility of an eventual default or charge-off. Studies commissioned by the American Banker Association’s credit risk subcommittees have shown that up to 18% of all charge-off losses may be eliminated by a timely intervention, negotiation, re-arrangement, loan modification, payment series deferment, or other early delinquency management tool that has been made available during the two-month EDM window -- per the appropriate bank policy -- to a loan administrator working with a customer’s case.

This high level of avoidable loss owes much to delays in choice, justification, and approval of early delinquency management actions. In other words, risk management must make an informed recommendation to justify authorizing a variety of different actions on a case-by-case basis, and the decision must be approved and implemented with respect to the appropriate customer communication channel. This process is slow and often encourages the deterioration of account status.

A more predictive approach using Daric’s risk management platform allows for the optimal choice of customer accounts by expected return on EDM efforts and provides a “next-best-action” multi-segment model to recommend actions for approval to the appropriate loan administrator. This allows for fast delinquency management actions to be taken, while satisfying the need for review and adherence to bank policy.

Two metrics for “outcomes” are assessed: a return to “current” status within 60 days and the avoidance of a charge-off. First, a ranking algorithm is developed using topological clustering analysis to segment and assess the best prospects for intervention or modification. Then, a sensitivity analysis is performed in each segment to determine to which action sets (deferment, modification, intervention, communication.) the eventual outcome is most sensitive. Third, the results of the first two phases are used to create a “next-best-action set” model for the management of early delinquent accounts.

Once the results are obtained, the Daric platform is used to create the segments and rankings, as well as to integrate account recommendations and suggested actions to be approved by the appropriate administrators into the loan and customer management workflow.

This case study is based upon the consumer loan portfolio of a Chicago (United States) based bank, originating over \$3 billion per year, which illustrates the effectiveness of an artificial intelligence (AI)-driven approach to managing early delinquency. As one of the forty largest lenders in the United States, the client provided a comprehensive historical data set, which included the associated intervention attempts and the eventual outcome and losses observed for each account.

Data Preparation

In the first phase, data cleansing and extraction were performed using the AI platform on approximately 5,000,000 rows of customer records, along with integration of unstructured data and document text into the data graph. The final representation, which originally included approximately 3,200 features, established dependencies and correlations between customer attributes. To perform the analysis, the platform implemented a feature selection, which reduced the number of features to 120.

Once the initial segmentation was done, the platform used the two “outcome” metrics to train a CART Forest model for the likelihood of a successful outcome in each segment upon intervention without feature separation or knowledge of the specific actions taken. This was used to rank newly delinquent customer accounts by priority for intervention. The limitations of this approach are obvious: while it can identify the best prospects for some form of intervention or adjustment, it does not suggest at all precisely what type of action should be taken.

Sensitivity Analysis

In many ways, the purpose of AI is to augment and extend human intelligence and to empower subject matter experts and risk management staff to better use the data resources available to them. Daric’s sensitivity and stress analysis capabilities allow for an initial ranking of action sets by their correlation with a successful outcome.

Creating features from EDM action sets and past interventions taken in the two-month window is often a challenge. A separate Principal Component Analysis (PCA) routine was run to assemble about 120 different possible action sets and scenarios into discrete features for the bank, consistent with established policy. These sets included payment rescheduling, deferment or adjustment of payments, loan modification, and knowledge-based interventions, with combinations of these action sets creating yet more features.

A sensitivity analysis was performed on the CART Forest derived in Phase 1 on the Daric platform for each grouping, along with a stress test to assess the impact of material changes to obligations, circumstances, or macroeconomic environment on the recommendations. This allowed for the ranking of action sets by highest sensitivity (change in positive correlation) to the two metrics for a successful outcome.

A “Next-Best-Action” Model

Daric’s platform supports the creation of a comprehensive multi-segment “Next-Best-Action” decision tree, with the matching of customer account details to action sets and intervention strategies. These recommendations from the “Next-Best-Action”



model available for review, justified with a full decision tree and model documentation, and available for generation against new accounts.

In the case study, this represented the next phase in the Early Delinquency Management improvement initiative. Once the final set of CARTS for the various customer segments was obtained to produce the “Next-Best-Action” for each account ranked by priority, bank staff could use the recommendations to manage and coordinate interventions with customer-facing team members as well as with servicing and collection team members. In the second phase, the bank reported an average of 128 minutes saved on decision recommendations to EDM staff and a 15.2% increase in automated customer outreach based upon EDM recommendations. A particularly valuable feature was the capability to move recommendations from model output to impactful customer interactions in a fast and effective way.

Extending the Daric platform to assess optimal payment or loan modifications in a particular scenario is a natural next step. Other models to determine a best course of action and to prioritize accounts for intervention allow for substantial loss reduction.

About Daric Connect

Daric Connect is offered by Daric Inc. in partnership with leading systems integrators, providing comprehensive data, technology and solution management services to leading financial institutions worldwide.



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About Daric

Daric, Inc. provides credit risk management, digital lending, and AML platform solutions to banks, credit unions, and financial institutions worldwide. Backed by leading figures in the financial and technology industries including former Wells Fargo CEO Richard Kovacevich, Daric is based in Silicon Valley, CA, providing solution services and worldwide support. Our team includes veterans of the world's leading financial and financial technology companies such as Palantir Technologies and Teradata Systems.

