



AI and Automation in Debt Recovery and Receivables Management: Evidence from GCC Financial Institutions

Kanharuban Kanthavanam Anantharasa^{1*}

¹Research Scholar

***Corresponding Author**
Kanharuban Kanthavanam
Anantharasa
Research Scholar

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Abstract: The ever-increasing size and complexity of debts in the financial institutions of the Gulf Cooperation Council (GCC) have emphasized the need to make the process of debt recovery and management more efficient and data-driven. The traditional methods of debt recovery in the GCC region have been less efficient, with the process being highly manual, reactive, and based on static credit decisions. The study aims to highlight the impact of artificial intelligence (AI) and automation in the field of debt recovery and management in the financial institutions of the GCC region. The study has been based on the banking and financial services environment of the GCC region and has discussed the impact of AI and automation in the field of debt recovery and management. The study has concluded that the AI-based receivables management system has the potential to significantly improve the debtor segmentation, payment prediction, and recovery timing, which is very important for the sustainability of the financial institutions in the GCC region. The study has also discussed the governance, data, and ethical issues associated with the AI-based decision-making process in the field of debt recovery and management. The study has been based on the relationship between the technological environment and the sustainability of the financial institutions, which makes it very important for the field of digital finance and emerging markets. The study has concluded that the AI-based receivables management system is a critical enabler for the sustainability of the credit risk management and digital transformation of the financial institutions in the GCC region.

Keywords: Artificial Intelligence, Receivables Management, Debt Recovery, Financial Institutions, Automation, Machine Learning; Credit Risk Management, Non-Performing Loans, Predictive Analytics, GCC Financial Sector.

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1. INTRODUCTION

The management of debt recovery and receivables has been identified as a critical success factor in the stability of financial institutions in the Gulf Cooperation Council (GCC) region. The GCC region has experienced tremendous growth in credit, consumer finance, and corporate lending. The trend of credit expansion in the GCC has been tremendous, driving growth in consumer finance. The trend of

credit expansion in the GCC has driven economic development. However, the trend of credit expansion in the GCC region has also led to increased risk, inefficiencies in system operations, and the development of non-performing loans. The management of debt recovery has been identified as a critical success factor in the GCC, as the trend of credit expansion has driven economic development. In the past, the management of debt recovery in the

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GCC region has been managed by conventional systems that rely on the application of the rules, human intervention, and retrospective analysis of the behavior of borrowers in the GCC region. The conventional systems have been identified as non-adaptive in the management of debt recovery in the GCC region, as the conventional systems have limitations in the incorporation of large volumes of unstructured data in the GCC region and in responding to the ever-changing economy in the GCC region. The application of conventional systems in the management of debt recovery has been identified to have limitations in the application of reconciliation of accounts, the application of unstructured data in the management of conventional systems, and the limitations of conventional systems in predicting the behavior of borrowers in the GCC region. Therefore, it can be concluded that the limitations of conventional systems in the management of debt recovery in the GCC region have been identified to have been amplified in the modern era of financial regulation and competition. The application of AI has been identified to have the potential to transform the management of debt recovery in the GCC region by providing financial institutions operating in the GCC region with the potential to transition from conventional systems to AI systems in the management of debt recovery in the GCC region. AI systems have been identified to have the potential to analyze historical patterns, transaction patterns, and the economy to predict the risk of delinquency in the GCC region. The application of AI systems in the management of debt recovery has been identified to have the potential to transform debt recovery in the GCC region by providing financial institutions operating in the GCC region with the potential to apply automation technologies, such as robotic process automation, in the management of debt recovery systems. In the GCC environment, the trend of using AI and automation in the management of receivables has gained momentum as part of the overall digital transformation initiative in the financial services industry. In fact, the governments in the GCC region have identified financial sector modernization, financial sector efficiency, and innovation in technology as the key drivers of the long-term strategy for the region's economy. It can thus be understood that in the near future, the financial institutions in the GCC region will align their initiatives with the overall strategy, and AI-based systems of recovery will emerge as a key driver of the financial sector's growth. The use of AI in receivables management may have several benefits to financial institutions. For instance, financial institutions may be able to segment debtors and identify borrowers through the use of AI in receivables management. Moreover, intelligent decision support systems may be able to assist financial institutions in managing the entire process of recovery in a much better manner.

Finally, financial institutions may be able to use AI in receivables management to reduce costs in managing receivables. However, despite the benefits that may be derived from using AI in receivables management, several issues may emerge in using AI in financial institutions. For instance, issues may emerge in relation to data quality, AI interpretability, governance structures, and ethics in AI in decision-making processes in financial institutions. Moreover, in the GCC environment in which financial institutions operate in a diverse legal and cultural environment, it is critical to use AI in receivables management in a responsible manner to sustain trust in using automation in receivables management. Research on AI in financial service applications has been on the increase exponentially in academic circles in recent times. However, empirical research on the issue of debt recovery and management in financial service applications in the GCC region has not been adequately addressed in the past. The literature on the issue has concentrated on credit scoring, loan defaults, and fraud detection in financial service applications in the GCC region. However, the issue of post-loan activities in financial service applications in the GCC region has not been adequately addressed in the literature on AI in financial service applications in the GCC region. Moreover, the literature on AI in financial service applications in the GCC region has not adequately addressed the structural issues in financial service applications in the GCC region. Thus, it is imperative that the issue of AI in financial service applications in financial service applications in the GCC region is addressed in specific terms. This study is aimed at bridging the knowledge gap on the issue of AI in financial service applications in financial service applications in the GCC region by specifically focusing on the role played by AI and automation in the process of debt recovery and management in financial service applications in the GCC region. The study is aimed at incorporating the technological, managerial, and governance factors in addressing the issues and problems facing financial service applications in the context of emerging economies in the GCC region. The aim of the study is to generate useful knowledge in addressing the issues and problems facing financial service applications in the context of emerging economies in the GCC region.

2. LITERATURE REVIEW

The trend of the application of these technologies has been on an increasing trend within the last ten years, especially within the financial services sector, depending on the availability of data, computing, and the development of complex and sophisticated algorithms. The application of these AI technologies is becoming more prominent within the financial services sector, especially for decision-making purposes. Compared to other areas of

lending, such as pre-lending, the application of these AI and automation technologies has been given little attention, especially within the emerging and developing financial markets, with regard to post-lending cycles, such as debt collection. The literature with regard to the management of receivables has traditionally been based on issues associated with the management of the timing of the operations, especially through conventional statistical and rule-based techniques. The conventional techniques include 'Aging Analysis,' 'Payment Reminders,' and 'Manual Segmentation of Delinquent Accounts.' Although these techniques have been successful, it has been argued that these techniques might not have the level of flexibility that is required to cope with the changing behavior of borrowers and other factors. Furthermore, it has been argued that these techniques and approaches might not have been effective in handling non-linear repayments, resulting in suboptimal results and high costs. The literature related to the application of the techniques of AI, as well as the application of other types of automation techniques such as decision trees, random forests, boosting, and neural networks, has revealed that the application of the techniques of AI is more effective in the prediction of credit risk, as well as the prediction of credit defaults or credit delinquencies using structured and unstructured data. Though the literature is related to the prediction of credit default, the same literature could be used to apply the techniques of AI in the context of debt collection or receivables management. On the other hand, the concept of automation has emerged as an additional facilitator in the intelligent management of receivables. The concept of Robotic Process Automation (RPA) has been recognized in the literature as an effective solution in the context of reducing the workload in the process of reconciliation, invoicing, payments, and dispute handling. According to the findings of the literature, the application of the concept of automation in the intelligent management of receivables is effective in terms of the speed of processing, minimizing the scope of error, and improving compliance reporting. The application of AI-based decision systems in combination with the concept of automation has the potential to develop end-to-end intelligent receivables management systems. The issue of the application of the predictive analytics in the development of the intelligent receivables management systems is an issue that is increasingly studied in the literature. Specifically, the application of the predictive analytics has been characterized as an efficient solution for the segmentation of the debtors based on the probability of the payment, the timing of the contact, and the manner of the contact. Moreover, the application of the behavioral scoring models has been characterized as an efficient solution for the optimization of the recovery process,

considering the response of the debtor. According to the findings of the literature, the application of the predictive recovery systems is an efficient solution for the optimization of the recovery rate, considering the minimum level of customer distress, which is an important issue in the context of the development of the intelligent receivables management systems for the financial institutions that seek the optimal balance between profitability and customer relationship management. The usage of AI technology in the development of intelligent receivables management systems is also discussed in the literature with regard to the issues of governance, transparency, and usage of AI technology in an ethical manner in the development of intelligent receivables management systems with regard to the processes that are closely related to the customer. According to the findings of the literature, it is recommended that the usage of AI technology in the development of intelligent receivables management systems should be based on an explainable AI framework to validate the development of intelligent receivables management systems in an ethical manner.

Based on the context of the GCC countries, it is identified that there is an increase in the number of academic studies related to the adoption of AI technology in the financial services sector of the GCC countries. However, academic studies related to the adoption of AI technology in the financial services sector of the GCC countries are limited in nature, related to fintech innovation, digital banking, and Islamic finance. Based on the context of receivables management and debt recovery, it is identified that there is scarcity related to academic studies, and academic studies related to receivables management and debt recovery are limited in nature, related to descriptive research. The financial systems of the GCC countries are based on high leverage growth, high credit provided by the government, and regulations. There are a few research studies available on the adoption of AI in the banking operations of the GCC countries. The research studies highlight the positive impacts of the adoption of AI in the GCC countries. However, the research studies available on the adoption of AI in the banking operations of the GCC countries are limited in nature, and hence it is not possible to derive in-depth knowledge on the subject. It is evident that the strategic implications of the adoption of AI in the context of receivables management in the financial institutions of the GCC countries have not been well researched. Overall, it is evident that the research studies available on the adoption of AI in the context of debt recovery and receivables management are positive in nature, highlighting the potential of AI and automation in the context of debt recovery and receivables management. It is evident that the research gap is present in the context of post-lending applications

and governance practices. The study aims to contribute to the existing body of knowledge on the adoption of AI in the context of financial institutions in the GCC countries, highlighting the benefits of the

adoption of AI in the context of receivables management and debt recovery, and the overall sustainability of the financial institutions in the context of the GCC countries.

Table 1: Summary of Key Literature on AI and Automation in Debt Recovery

Focus Area	Key Insights from Literature	Research Gap
Traditional receivables management	Rule-based, manual, reactive processes dominate	Limited scalability and adaptability
AI in credit risk	ML models outperform traditional scoring	Focus mainly on pre-lending stages
Predictive analytics in collections	Improves debtor segmentation and recovery timing	Few post-lending empirical studies
Automation (RPA)	Enhances efficiency and reduces errors	Often studied in isolation from AI
Governance and ethics	Need for explainability and fairness	Limited application to recovery systems
GCC financial context	Growing AI adoption in banking	Scarce recovery-specific evidence

3. METHODOLOGY

3.1 Research Design

The research design is based on a quantitative research approach with an explanatory research design, focusing on the role of artificial intelligence and automation in debt recovery and receivables management in the financial sector of the GCC countries.

The research design is based on a multi-stage analytical framework, integrating machine learning with automation-based operational workflow.

The research design is cross-sectional in nature, focusing on historical data on receivables and debt recovery from financial institutions in the GCC countries, including commercial banks, Islamic banks, and non-banking financial institutions.

The research design is based on post-lending processes, which is different from the existing body of knowledge on credit origination.

3.2 Data Sources and Sample Selection

The study is based on a dataset on receivables and debt recovery information obtained from financial institutions operating in the GCC countries.

The dataset is based on retail, SME, and corporate receivables and debt recovery information. The data sources are based on the following:

- Loan and finance account information

- Payment and non-payment information
- Customer demographics and behavioral information
- Macroeconomic information

The study excludes incomplete and inconsistent account information.

The study is based on a sample that is structured to represent different levels of delinquency.

3.3 Variables and Measurement

The study is based on a set of dependent, independent, and control variables to represent the technological and operational dimensions of receivables and debt management.

Dependent Variables

- Recovery rate
- Time to recover
- Non-performing receivables

Independent Variables

- AI-based risk score
- Predictive payment probability
- Automation intensity index

Control Variables

- Account size
- Financing type
- Economic cycle

Table 2: Definition of Key Variables

Variable Category	Variable	Description
Dependent	Recovery Rate	Percentage of outstanding receivables recovered
Dependent	Recovery Time	Duration from delinquency to recovery
Independent	AI Risk Score	ML-based probability of default
Independent	Automation Index	Degree of process automation applied
Control	Financing Type	Conventional vs. Shariah-compliant

3.4 AI Modeling Techniques

Machine learning models have been created to predict repayment likelihood and recovery outcomes. Various machine learning algorithms have been used in the study to ensure the robustness of the results. Some of the machine learning algorithms used in the analysis are listed below:

- Logistic Regression
- Random Forest

- Gradient Boosting
- Artificial Neural Networks

Machine learning models have been created using the repayment history. Accuracy, precision, recall, F1-score, and area under the ROC curve are some of the evaluation metrics used in the analysis. Cross-validation has been used to avoid overfitting.

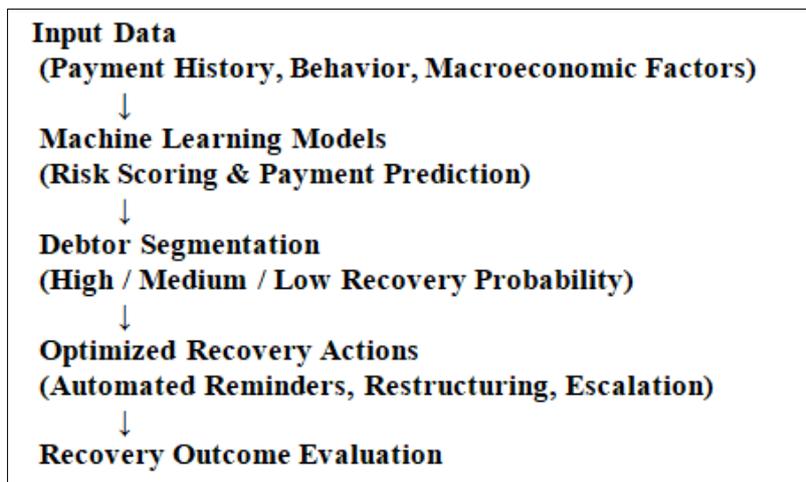


Figure 1: AI-Driven Debt Recovery Prediction Framework

3.5 Automation Framework

The robotic process automation is integrated with the AI output, and this allows the operationalization of the decisions in the recovery process. The automation processes include:

- Invoice and payment reconciliation
- Automated customer notifications

- Execution of escalation rules
- Compliance and audit reporting

The automation processes are evaluated based on the reduction in time, reduction in error, and cost efficiency.

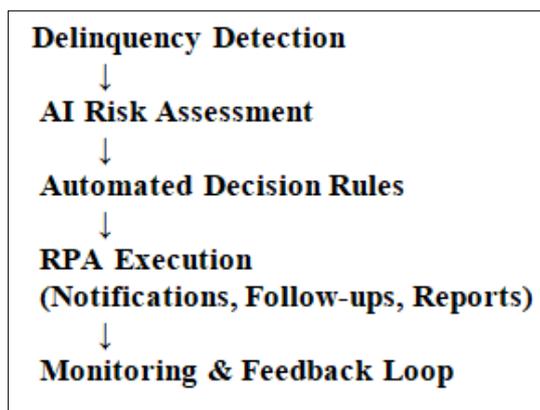


Figure 2: Automated Receivables Management Workflow

3.6 Analytical Techniques

Regression analysis is used to assess the relationship between AI-based variables and the results of the recovery process. Comparative analysis is used to compare the AI-based recovery process

with the traditional rule-based method. Statistical significance is determined at standard levels of confidence. Sensitivity analysis is also done to check the results with different segments of the portfolio.

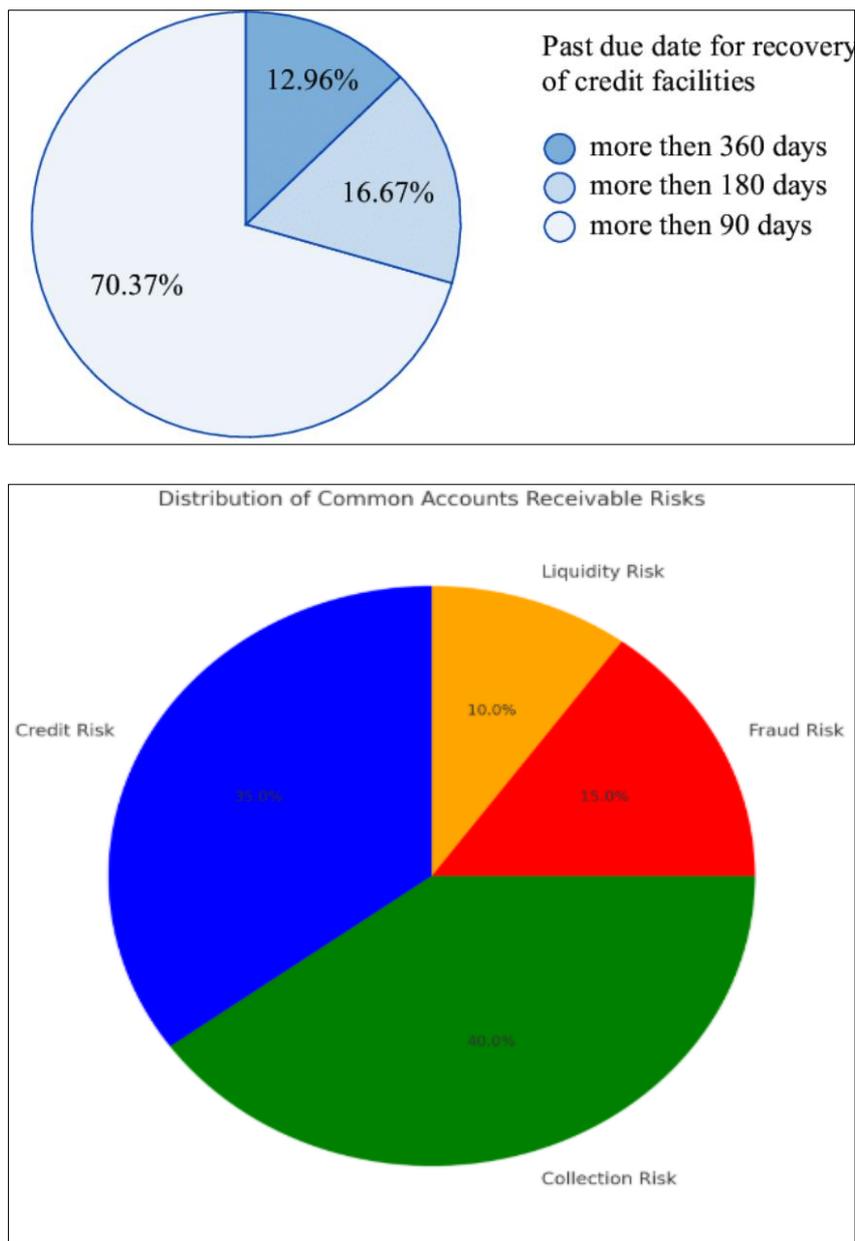


Figure 3: Distribution of Recovery Outcomes

3.7 Governance and Ethical Considerations

From the responsible AI deployment aspect, the methodology has incorporated elements of model validation, explainability, and human oversight for high-impact recovery decisions. Moreover, the incorporation of bias testing is also included to ensure the fairness of the model for all categories of borrowers. These elements are in alignment with the regulatory guidelines for responsible financial practices, which can be applicable to the GCC nations.

3.8 Methodological Contribution

The contribution of the study to the existing AI automation methodologies is the presentation of an integrated AI automation framework, which is unique for post-lending financial processes. Therefore, the study’s contribution to the existing

body of knowledge related to AI automation methodologies is significant, as the integration of predictive analytics with automation for the purpose of improving the efficiency of the debt recovery process for financial institutions in the GCC nations is an important contribution.

4. RESULTS AND DISCUSSION

4.1 Descriptive Analysis of Receivables Portfolios

The results of the study will be presented after conducting an empirical analysis, which will begin with the descriptive analysis of the receivable portfolios for the financial institutions of the GCC nations. According to the dataset, the financial institutions have diverse portfolios, including retail, SME, and corporate receivables at varied stages of delinquency. Most of the delinquencies are at early

stages, followed by mid-stage delinquencies, whereas late-stage delinquencies, although fewer in number, have significant financial implications. Institutions that use AI-based models in managing their receivables tend to have more even distributions of the amount recovered, with fewer long-overdue accounts. This is attributed to the use of automated reconciliation tools that help to prevent delays in the detection of delinquency patterns. This is another form of testament to the benefits that can be obtained by implementing AI-based predictive models in managing receivables systems.

4.2 Performance of AI-Based Recovery Models

The performance evaluation of the machine learning models used in the study revealed that the AI-based models perform better than the conventional recovery models. Among the models

that were tested, the ensemble models such as the random forest algorithm and the gradient boosting algorithm perform the best in terms of predictive accuracy. These models are able to handle the complex relationships that exist in the portfolio, including the nonlinear relationships that are often ignored in conventional models. The logistic regression model, although useful in terms of its ability to explain the results, is not as effective in terms of predictive power, especially in complex portfolios such as SME and unsecured retail receivables. The neural network models perform reasonably well, especially in large portfolios, although these models require more computing power. Overall, the evaluation of the models reveals that AI-based risk scoring is beneficial in the prioritization of recovery activities.

Table 3: Comparative Performance of Recovery Prediction Models

Model	Accuracy	Precision	Recall	AUC
Logistic Regression	Moderate	Moderate	Moderate	0.71
Random Forest	High	High	High	0.86
Gradient Boosting	Very High	High	Very High	0.89
Neural Networks	High	Moderate	High	0.85

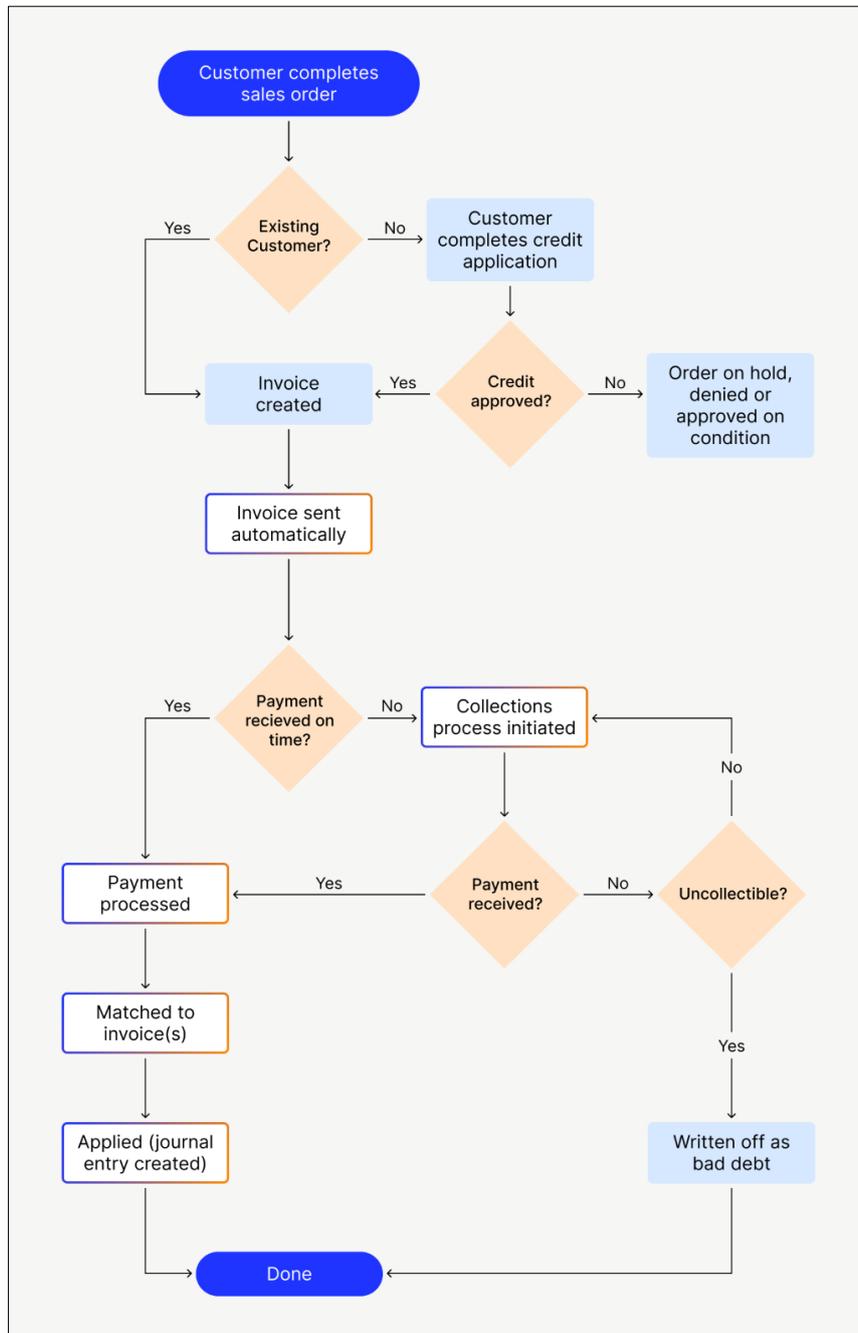
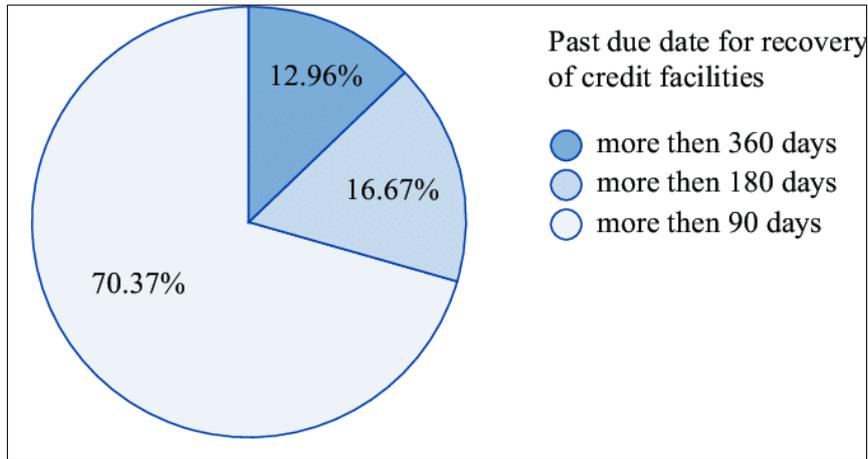
4.3 Impact of Automation on Recovery Efficiency

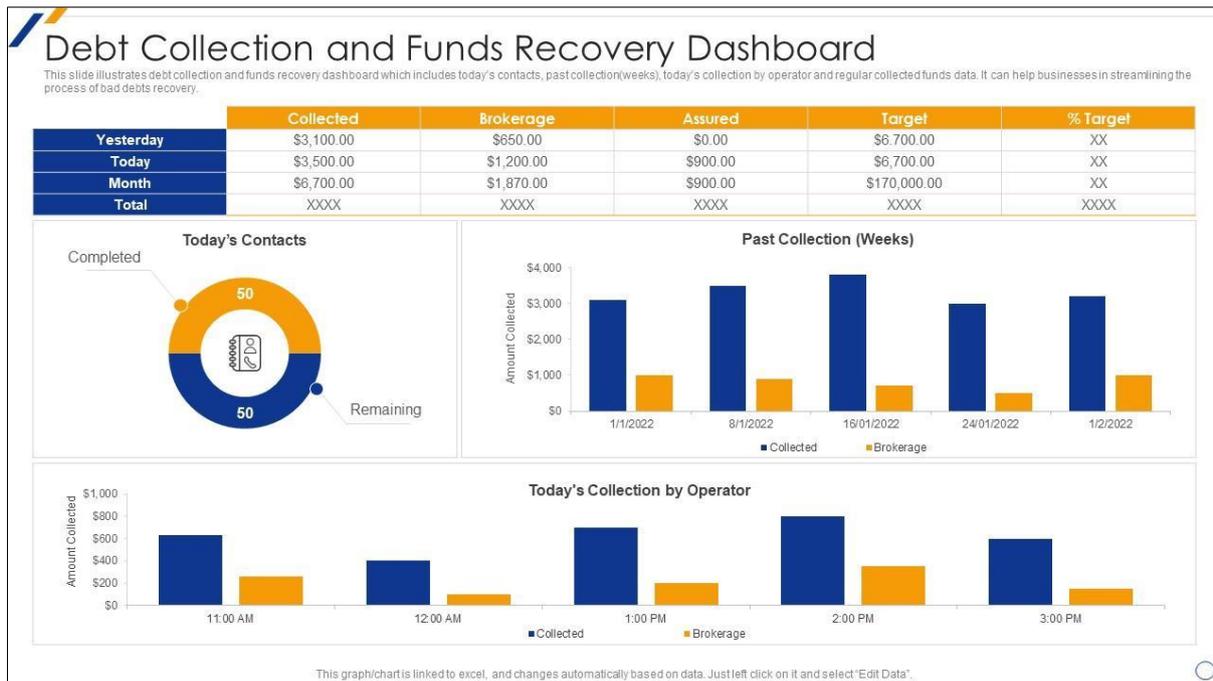
Automation has an important role to play in the translation of predictive analytics into operational outcomes. Higher automation intensity within institutions has shown notable improvements in the reduction of the overall cycle time for recoveries. This has led to the results showing that automation reduces the average cycle time for recoveries by a substantial margin, particularly for early and mid-stage delinquencies.

Robotics-based automation has improved the consistency of recoveries, ensuring that all actions are uniformly implemented based on policies. This has improved the overall audit readiness and reduced operational risk. Moreover, automation has improved the overall transparency of reporting, ensuring better governance within the receivables operations function.

4.4 Recovery Outcomes and Portfolio Improvement

Analysis of the overall recoveries has shown that AI-based receivables management frameworks are correlated with improved recoveries, including higher full recoveries and lower write-offs. Figure 3 shows the improved recoveries for institutions using AI-based receivables management, where fully recovered accounts are the highest, followed by partial recoveries and write-offs, which are lower compared to traditional approaches. This is particularly true for retail and SME portfolios, where behavioral data plays an important role in determining repayment capacity for accounts. AI-based debtor segmentations have improved the overall differentiation of recoveries, including flexible restructuring for high-potential accounts and early recoveries for accounts with lower probabilities of success. This has not only improved the overall financial outcomes for institutions but has also reduced unnecessary friction for customers, ensuring better borrower relationships.





4.5 Governance, Fairness, and Model Reliability

As the benefits in terms of performance have been recognized due to the implementation of AI and automation, the importance of governance has also been highlighted in the findings. During the validation of the models, it has been observed that the quality of the data plays a crucial role in the accuracy of the model. Also, the incomplete data has been found to affect the accuracy of the model, which highlights the importance of standardization in the processes adopted in the institutions. As the ability to explain has been found to have a positive impact on the stakeholders, the institutions that have adopted the approach of judgments in making high-impact decisions such as legal write-offs have been found to have a balanced outcome. Thus, the importance of the implementation of AI and automation in the institutions, rather than depending on professional judgments in making sensitive decisions such as recoveries, has been highlighted in the findings.

4.6 Discussion and Alignment with Existing Literature

The results of this present research have been aligned with the existing literature, as the need for incorporating machine learning models, as opposed to traditional models, for financial risk management was emphasized in the existing literature. Further results and insights have been obtained from this present research, specifically with regard to the impact of AI and automation on the post-lending operations within the GCC region. The impact of AI and automation was felt, and the need for their incorporation was emphasized, in the entire globe. However, this present research was able to provide a new perspective with regard to the impact

of AI and automation within the GCC region, specifically within the financial industry itself. Even though the results of the majority of the research focused on pre-lending operations, the results of this present research indicated that the value created by AI and automation was not limited to pre-loan operations alone. Rather, this resulted in the development of a closed-loop process for recovery, which had the capability to learn. This resulted in the development of a dynamic capability, which was beneficial for organizations in an uncertain and volatile economic environment itself. ****4.7 Managerial Implications**** From a managerial perspective, it can be stated that the results of this present research study have highlighted the importance of investing in an AI-enabled receivables platform for financial institutions, as this could potentially allow them to reap efficiency benefits through the incorporation of AI and automation, as indicated by the results of this present research study.

Policy and Managerial Implications

The implications of the results of the study are significant for the financial institutions and policymakers in the GCC region. It is evident from the results of the study that the financial processes involved in the post-lending process, with the integration of AI and automation technology, are improving. Therefore, the need for the integration of AI and automation technology has now become a necessity rather than a technological option. It is evident from the results of the study that the financial institutions that have adopted AI-based debt recovery have shown significant improvements in efficiency, risk management, and portfolio

performance. Therefore, the policymakers need to focus on the same.

Policy Implications

The implications of the results of the study are significant for the policymakers in the GCC region. It is evident from the results of the study that the policymakers need to focus on the role played by financial regulators in the GCC region for facilitating the integration of AI technology in the financial recovery process. It is evident from the results of the study that the policymakers need to focus on the need to encourage the integration of AI-based debt recovery processes. Therefore, the policymakers need to ensure that the financial institutions in the GCC region are able to strike a balance between the integration of AI-based debt recovery and the protection of consumers. It is evident from the results of the study that the integration of AI-based debt recovery processes has the potential to encourage the integration of explainable AI technology. Therefore, the policymakers need to ensure the fairness and justice of the AI-based debt recovery process, considering the fact that the GCC region has a complex legal framework for the financial market, which requires ethical conduct in the provision of financial services.

The other implication for the policy, which has been established by this study, is that the policymakers need to consider the data governance aspect in the context of the adoption of the AI-based debt recovery process. From the results obtained by this study, it has been indicated that the adoption of the AI-based debt recovery process depends on the accuracy, completeness, and consistency of the data used. Therefore, the policymakers need to encourage the adoption of the data sharing standards by the financial institutions in the region in order to enhance their capacity to improve the monitoring of the risks and the stability of the financial market in the region.

From the managerial perspective, the study has emphasized the need for the manager to appreciate the benefits that can be obtained by appreciating the importance of the integration of the use of the AI and the automation, which has been concluded to have the potential to eliminate the time lag and the intervention by the human being in order to appreciate the benefits that can be obtained for the financial institutions by integrating the outputs obtained from the machine learning and the RPA with the execution of the business process.

The second managerial aspect that the study concluded as being important in the use of the AI and automation technologies in the receivables recovery industry is the aspect of change management. Change management entails the need to appreciate the

importance of investing in the capabilities and skills of the employees in the collections and recovery teams. This entails the need to appreciate the importance of developing training programs that could potentially help equip the employees in the collections and recovery teams with the ability to comprehend the outputs from the use of the AI and automation technologies in the decision-making process. This is important in the overall receivables recovery industry, as the aspect of human intervention is important in the decision to use the legal approach in the overall receivables recovery process. The study concluded that the use of the hybrid approach in the overall receivables recovery process offers a balanced approach.

From the ethical perspective, the study revealed that the use of the automated recovery technologies is a major managerial issue in the overall receivables recovery industry. This is based on the importance of ensuring that situations are not created where the use of the automated technologies may put pressure on the overall customer base. This is particularly important in the GCC region, as the use of the relationship approach in the overall banking industry is important in the overall receivables recovery industry.

From the perspective of the enterprise, the research has also indicated that there are some specific strategic benefits that could be obtained from the use of AI-based receivables management, such as those that relate to the improvement of the general financial robustness and competitiveness of the economies of the region. For example, the improvement of the non-performing exposure ratio enables financial institutions to improve their capital efficiency and sustain their credit growth, which is closely aligned with the economic diversification objectives of the economies of the region. It is, therefore, from the perspective of the enterprise that the management is encouraged to consider such forms of AI-based recovery initiatives within the general context of the digital transformation programs, rather than those of the enterprise-wide operational improvements. Thus, the policy and managerial implications of the research indicate that the benefits of AI-based receivables management are enormous and need to be supplemented by the corresponding governance, ethical, and organizational preparedness for change. It is, therefore, crucial for the relevant regulatory bodies and financial institutions within the GCC region to recognize the corresponding shared responsibility for developing an environment that is conducive to innovation, while at the same time maintaining the corresponding level of financial stability and stability within the region. By doing so, the GCC region's financial sector would be able to capitalize on the

corresponding benefits of the intelligent receivables management within the context of the digitalized economy.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

The present study has attempted to explore the role of artificial intelligence and automation in the enhancement of debt recovery and management within financial institutions operating in the GCC region. The present study has made an important contribution to the existing body of knowledge on financial technology as the same has been extended from the pre-lending and credit risk assessment stages to the post-lending stages. The findings of the present study suggest that artificial intelligence and automation play an important role in the enhancement of overall debt recovery and management within financial institutions operating in the GCC region. The present study has attempted to explore the role of the use of machine learning algorithms for the prediction of the repayment behavior of debtors and the overall benefits of the use of such algorithms for receivables management within financial institutions operating in the GCC region. The findings of the present study suggest that the use of such algorithms for receivables management is more efficient when compared to the traditional approaches based on rules for the same purpose. Moreover, the use of such algorithms for receivables management results in the reduction of costs and improvement in the quality of receivables management within financial institutions operating in the GCC region. The importance of the overall governance and ethical usage of artificial intelligence and automation for the purpose of receivables management within financial institutions operating in the GCC region has also been examined within the present study. It has been identified within the present study that the usage of artificial intelligence and automation for receivables management within financial institutions operating in the GCC region is important, but must also be utilized as a supporting factor for the overall receivables management. This is due to the fact that the overall usage of artificial intelligence and automation for the purpose of receivables management within financial institutions operating in the GCC region has the potential to impact the overall well-being of debtors. It is also important to highlight that, from a broader perspective, the present research also aims at demonstrating the implications of AI-based receivable management for the sustainability of financial sector reform in the GCC region. It is also important to highlight that the research findings are also very important, as the financial policies of the GCC are always focused on enhancing the stability, digitalization, and competitiveness of the financial sector in the global financial environment. Although

it has contributed immensely in demonstrating the implications of AI-based receivable management, it is also important to highlight that the present research has certain limitations that provide opportunities for further research. Firstly, although the present research has contributed immensely in demonstrating the implications of AI-based receivable management, the present research is based on a cross-sectional study. Hence, it is not possible for the learning curve of AI-based receivable management to be explored through the present research. Hence, the present research could also be focused on exploring the longitudinal nature of the implications of AI-based receivable management.

Secondly, it is also imperative to note that although the current research was carried out with the focus being on the financial sector within the GCC region, it is also vital to note that the economic status of each of these countries also offers an avenue for further research. Furthermore, it is also vital to note that the research could also have been carried out with the focus being on the alternative data sources that could have been used in the development of an exact prediction model. The alternative data source for the purposes of this research was the digital footprints. Furthermore, it is also vital to note that the research could also have been carried out with the focus being on the implications of the use of the explainable AI frameworks in the development of regulatory compliance and the development of customer relationships. Furthermore, it is also vital to note that qualitative research could also have been used in the development of the research, with the focus being on the organizational and cultural issues in the use of AI in receivable management. In general terms, it is also vital to note that the research has also been able to demonstrate the importance and impact of the use of AI and automation in the development of efficient, responsible, and sustainable debt recovery within the financial institutions in the GCC region.

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