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Developing a Hybrid Predictive Model for Measuring Customer Lifetime Value (CLV) based on Marketing and Accounting Data and its Role in Improving Management Decisions: An Applied Study in Iraqi Private Banks

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Abstract. To boost accuracy in the calculation of Customer Longevity Value (CLV) as a marketing asset, this study aimed to develop and apply a hybrid model between behavioral and perceived marketing data and quantitative and financial accounting data. In addition, it sought to forecast the impact of the outcomes of this model on improvement of the effectiveness and quality of strategic and administrative decisions of the Iraqi private banking industry. To achieve these objectives a questionnaire was designed as a primary tool for data collection which was administered to a representative purposive sample of 150 clients and decision-makers of Iraqi private banks. The data was analyzed statistically using the statistical package for the Social Sciences (SPSS) and the structural equation modeling (SEM), in order to test the validity of measurements and hypotheses. The study yielded a number of key findings: Most notably, the study found a statistically significant difference in accuracy between the suggested hybrid predictive model and one-sided models (either accounting-only or marketing-only) in predicting Customer Longevity Value. Additionally, the results demonstrated that the hybrid model's outputs have a significant and positive impact on the effectiveness of banks' strategic decisions, accounting for 55.5% of the changes in these decisions, especially those pertaining to the best use of marketing resources, the creation of smart customer retention policies, and the design of digital banking services. Based on the macropath analysis, the "Customer Long-Term Value (CLV) measurement accuracy" with the highest overall effect size (0.86) is the main mediator between the combination of marketing/accounts information and the impact on decisions. To protect the sustainability of their competitive advantage, the study recommended rationalizing the amount of promotions and focus on positive profit segments and establishing "bank data integration" units, which combine accounting information systems (AIS) and customer relationship management (CRM) systems, to bring about organizational isolation among Iraqi private banks.

Keywords: Customer lifetime value - Marketing and accounting data - Managerial and strategic decisions - Iraqi private banks.

1. Introduction

With the fierce competition they face in the market, modern business corporations, particularly banks, have to resort to complex management and financial strategies to remain sustainable and gain their competitive advantage. With the transition to a digital, knowledge-driven economy, intangible assets are now part of the evaluation of bank performance in addition to the traditional ones. This has led to the introduction of one of the most important strategic KPIs, namely "Customer Lifetime Value" (CLV): the net financial value that the bank receives from the customer over the course of their relationship. Although the CLV statistic is very significant, in reality there is a significant lack of alignment between marketing understanding and accounting understanding. Whereas accounting information deals with past cash flows, actual costs, and reported profits, marketing information deals with consumer behaviour, loyalty and retention rates. When one aspect is emphasized over the other, an insufficient and imprecise estimation model is developed. The article presents from this perspective a “Hybrid Predictive Model,” which is an effective blend of accounting factors and marketing signals that provide a more complete picture and more

accurate projections to the bank manager using state-of-the-art quantitative tools. When this study is applied to the private banking environment in Iraq, it becomes extremely significant since the country's private banking industry is confronted with a number of obstacles pertaining to the shift to financial inclusion, the requirement to diversify services, and the development of consumer trust. These banks' failure to calculate the profitability of their clients using advanced analysis strategies impacts their strategic choices in attracting and retaining the most profitable clients and their ability to resource effectively. The suggested model's scientific worth goes beyond its theoretical component to include its role as a crucial instrument for bettering management choices. The hybrid model will provide outputs that will support risk and credit management decisions, allow senior/executive management in the banks under study to rationalize marketing expenditures and develop appropriate pricing strategies. These activities will positively impact the bank's overall financial performance and competitiveness.

Section One: The Scientific Methodology of the Study and Previous Studies

Research Problem: With the private banking sector in Iraq undergoing structural change towards digitalization and financial inclusion, the ability to retain its customers and earn profits in the future are essential to bank sustainability. The research problem is the inadequacy of the current traditional approaches for developing accurate and predictive customer value measures. This is due to a lack of knowledge and analysis between the accounting and marketing functions. A significant data gap exists in the private banking sector in Iraq, where accounting departments have limited access to historical financial data and the cost of funds and services and the marketing departments store consumer behavior data (loyalty, contentment, repeat visits), without making any connection to returns. It is difficult for management to predict consumer behaviour based on past accounting records only, as these provide only a retrospective approach. In a similar vein, making managerial decisions based only on marketing indications is risky and erroneous since it ignores actual profit margins and accounting expenses. Among the five banks, there is no formatting of a hybrid predictive model that dynamically integrates marketing and accounting variables in the administration of the banks studied. This lack of is the cause of many other issues, such as inadequate credit planning, inconsistent allocation of marketing resources and poor decisions about retaining valuable clients or letting others bleed bank resources. The main issue of the project is how this data gap can be filled and the quality of the strategic administration decisions in Iraqi private banks can be improved through the application of a hybrid predictive model that measures the present value (CLV) of the Iraqi private banks' clients based on marketing and accounting data?

Research Objectives: The main goal of this research is to create an integrated hybrid predictive model that measures the customer's present value (CLV) by combining accounting and marketing data. Also, it seeks to demonstrate how the outcomes of this model can contribute to bridging the gap between data and improving the quality of strategic management decision making by private banks in Iraq. To achieve this overall objective, the research is broken down into the following objectives:

Development of a comprehensive and up-to-date theory on the theoretical link between accounting (financial) and marketing (behavioral) determinants, and how such a theory impacts on the management decision-making and the level of accuracy of the customer's present value (CLV) measurement.

Evaluating the quality and accessibility of the existing marketing and accounting data structures used in Iraqi private banks (the study sample) and the level of knowledge and understanding of the management of the banks about the importance of integrating this data to overcome the problem of "isolated knowledge islands".

Development of a complex mathematical and statistical model (a hybrid model) that combines client behaviour characteristics and actual accounting charges, and then evaluation of the model's accuracy and reliability using the real data from the sample of the study clients.

Making and assessing the predictive output of the hybrid CLV model to guide strategic management decisions, such as allocation of marketing investments, design and engineering of banking services, customer retention policies for banks generating revenue and credit risk management.

Establishing a set of specific rules and procedures to help Iraqi private banks change from conventional to intelligent analytical and predictive systems, so they can get more value from the markets and be more competitive.

The Importance of the Research: The relevance of the study is that it follows the developments of the banking sector to the present and the growing trend of

investing in "customer capital" as a strategic asset. The purpose of the study is summarized below:
The study is of scientific value because it presents a theoretical and foundation framework that brings together two areas of knowledge that have been traditionally separated in the traditional practices, bank marketing and financial management accounting, and clarifies the philosophy of linking the two areas.

The research proposes a hybrid predictive model (based on current quantitative analysis methods) for calculating the customer's current value (CLV), which is useful for the Arabic and local libraries and which introduces new possibilities for future researchers to build their own model.

To the best of the researcher's knowledge, this study tackles the dearth of research and studies that have dealt with developing sophisticated predictive models for client profitability as applied to Iraq's private banking industry.
The study offers a workable solution to the problem of having two separate databases (marketing and accounting) at the bank, and converting raw information to meaningful strategic information.
The results of the hybrid model enable senior and executive bank management to make informed, forward-looking decisions.

By using this model, private banks in Iraq are able to enhance their financial performance and lower the expenses associated with drawing in unprofitable clients, which has a positive effect on indices of financial inclusion and banking stability in the country as a whole.

Research Hypotheses:

Main Hypothesis: Building and implementing a hybrid predictive model (based on the integration of marketing and accounting data) contributes to increasing the accuracy of measuring the customer's present value (CLV), which significantly improves and rationalizes the quality of strategic management decisions in Iraqi private banks.

Sub-Hypotheses:
First: There are statistically significant differences in the accuracy of predicting the customer's present value (CLV) in favor of the proposed hybrid predictive model compared to traditional one-sided models (which rely solely on accounting data or solely on marketing data).
Second: The outputs of the hybrid predictive model for measuring CLV have a statistically significant effect on improving the efficiency of strategic management decisions (related to the optimal allocation of marketing resources, the design of banking services, and customer retention policies) in the banks included in the study sample.

Hypothetical Research Model: This study's hypothetical model is based on the philosophy of integration and addressing isolated knowledge islands. The accounting and marketing data are linked together in the construction of a predictive model, and the influence of this model on the quality of the decision is then tested. The model is broken up into three primary axes:

Marketing dimensions such as customer retention rate, transaction frequency, and behavioral loyalty, as well as accounting dimensions such as customer acquisition cost, banking service provision cost and effective profit margin are the two main dimensions of Model inputs (Independent variable).

Model Treatment (Intervening/Interaction Variable): This is the model that combines the predictive models for measuring Customer Value for Customers (CLV). In this case, the first sub-hypothesis is explored to quantify the ability of this mathematical integration to present actual and future customer profitability results as opposed to traditional isolated models.

Model Outputs (Dependent Variable): It is the quality of strategic management decisions in Iraqi private banks. In this context, the second sub-hypothesis is tested to evaluate the effectiveness of the forecasting outputs (most profitable customers and resource draining customers) to support the decision-maker in making the right resource allocation decisions and good strategic planning.

Figure 1 Model

Research Methodology and Practical Application:

Research Methodology: The study is conducted with a mixed methodology, which is both theoretical and quantitative applied study, has 2 complementary tracks:

The Descriptive-Analytical Track: This track is about the cognitive aspect and a diagnosis of the current situation. It is a deductive review of extensive literature research and earlier studies which is used to create a conceptual framework and to break down the phenomenon of "isolated knowledge islands" between marketing and accounting. This is followed by a diagnostic study of the state of analytical structures and data systems in banks as they stand.

The Quantitative Applied Track: The process that is the essence of the study. It is based on the actual dual data that has been collected, from the banks sample customers, in their records and accounts (marketing behavior and financial accounting data). This data is then used to train sophisticated mathematical and statistical models to create a hybrid predictive model to calculate the Customer Present Value (CLV). The accuracy of the model is then statistically evaluated and the effects of the model on enhancing the quality of administrative decisions are quantified using the specialized statistical software.

Research Population and Sample:

Research Population: It is a sample of commercial banks in private ownership that are registered in the official database of Central Bank of Iraq. These banks are undergoing a rapid transformation towards adopting digital systems and financial inclusion applications.

A purposive sample was used for the research as per the nature of the study as dual and integrated data is required. The human sample comprises 150 people to determine the current situation with respect to the analytical environment. A sample of these banks' customers was also chosen for a longer and more specific time period (2026) so that enough behavioral data (retention and loyalty) and accounting data (actual costs and profitability) would be collected to develop and test the accuracy of the proposed hybrid predictive model (CLV).

Data Collection Tool: The questionnaire was the main instrument used to gather the data regarding diagnostic and impact components of the study. It was developed with the reference to reliable literature and earlier research that dealt with the research variables. The researcher used the 5-point likert scale ranging from strongly agree to strongly disagree. The questionnaire was face valid by showing to the expert judges in administrative, accounting and statistical field to make the instrument scientifically valid. Furthermore, the instrument was administered by conducting a consistency test (Cronbach's alpha coefficient), which was carried out to ensure that the instrument is reliable and has good internal consistency before being finally distributed.

Proposed Statistical Methods for Analysis: The advanced statistical tools will be adopted for the accomplishment of study objectives, testing of main, sub-hypotheses, analysis of main and actual data along with analysis of the extracted primary data from the study using specialized software (SPSS, Amos, or SmartPLS). These methods are distributed functionally as shown below:

Cronbach's Alpha is used to gauge the reliability and internal consistency of the study instrument (the questionnaire) and to ensure the target variables (marketing, accounting and administrative decisions) are being measured by the designed statements before starting the field analysis.

Confirmatory Factor Analysis (CFA): It is an advanced step to confirm the construct validity of the hypothetical model, to ensure the proposed indicators for the marketing dimension and accounting dimension is at the same level as the practical application of the banks which were involved in the study sample, and to confirm the good fit.

Multiple Regression Analysis (MRA): This analysis is used to measure the predictive and combination of predictive of the hybrid model against any single variable model in determining Customer Value Forecast (CLV), and to demonstrate the contribution of each dimension to the predictive accuracy of the hybrid model against any single variable model.

Structural Equation Modeling (SEM): This is the most significant statistical analysis tool in order to test the hypothetical model completely. It enables the simultaneous investigation of complex and complexed relationships (direct and indirect) of the outputs of the hybrid predictive model (CLV) on the quality and efficiency of the strategic management decision made by different dimensions.

Previous Studies and Comparison with the Current Study

Firstly: Previous studies

(Curiskis, et al. 2023) In this paper, we present a flexible machine learning approach to forecasting Customer Lifetime Value (CLV) in Business-to-Business (B2B) Software-as-a-Service (SaaS) environment. The substantive and modeling issues

arising in this context include more complex customer relationships, very diverse populations, a variety of product offerings, and limitations in the temporal data available. To tackle these issues, we treat the CLV estimation as a lump sum prediction problem across multiple products and develop a hierarchical ensembled CLV model. Lump sum prediction allows for the application of a broad class of supervised machine learning techniques, which offer increased flexibility, more features and demonstrate an outperformance over more traditional forecasting method. Hyperparameter model-tuning step of a customer segment model-tuning scheme is proposed for the ensembling of the model, which is well suited for constrained temporal data. The proposed model framework is applied to a B2B SaaS firm and empirical results show its benefits in solving a real-life CLV prediction problem compared to simpler heuristics and the traditional CLV approaches. In the final part, several business applications are introduced in which CLV predictions are used to optimize marketing spending, return on investment and achieve valuable managerial insights in this context.

(Malhotra, 2024) In today's retail landscape, Customer Lifetime Value (CLV) has become a key metric to measure the profit of customers over time, and inform long-term retail strategy. Estimating CLV using traditional statistical methods lacks the ability to account for non-linear customer behavior, high dimensional data and dynamic customer purchasing patterns. The explosive growth of machine learning (ML) techniques has transformed the world of predictive analytics, making more accurate, adaptive, and scalable CLV prediction models. The present study deals with the application of machine learning algorithms like Linear Regression, Random Forest, Gradient Boosting and Artificial Neural Networks for predicting CLV in retail environment. This research builds on Customer Equity Theory, Predictive Analytics Theory and Data-Driven Marketing Frameworks, and constructs a comparative predictive framework with empirically evaluated model performance based on 6,200 customers' transactional retail data. The findings show that the ensemble and deep learning models are much more accurate in the prediction of CLV than the traditional regression models. The findings can be useful not only for marketing science and machine learning, but also for retail managers looking to optimize their customer acquisition, segmentation, and retention strategies.

(Ali, 2024) The paper explores the complex relationship between Customer Lifetime Value (CLV), strategic marketing tactics and financial performance of an organization. The study is designed to provide useful information in making strategic decisions for marketers and business leaders, and utilizes a qualitative and quantitative approach to research. A total of 375 people were invited to participate and 332 questionnaires were considered as valid for analysis. The quantitative data collected from the customer transaction data and qualitative data collected from a set of questions show positive customer perceptions of CLV factors. The level of agreement with statements regarding product alignment, long-term perspective, re-purchasing, loyalty incentives and service oriented are moderate to high. The findings highlight the importance of CLV for the financial indicators, particularly market valuation (P/E ratio). Some of the suggested recommendations are to improve customer service, tweak marketing tactics, and ensure the company's financial health to instill consumer trust.

(Bataiev, 2026) The study emphasizes the creation of a holistic financial model for the deployment of AI agents in customer service and assessing their influence on operational efficiency, business margin, and customer LTV (Lifetime Value). The job sounds easy. In fact, it is not. The relevance is clarified by the fact that scientific methods for determining the economic impact of AI are still fragmented. As a result, it can be hard to view the big picture of how cost, productivity and customer behavior are related. The paper concentrates on the development of a model, which integrates operational indicators and behavioral characteristics with one model system to assess the financial results of an enterprise. The methodology used is conceptual-analytical type, system and comparative analysis. This is a common feature of most similar studies. At the same time, the outcomes from empirical research conducted during the last 4 years (from 2022 to 2026) are considered, and the contribution of AI agents to productivity, costs and customer behaviour is quantified. As part of this method, a synthesis of scientific positions was carried out and, on this basis, an analytical model of relationships between key financial indicators was built. Data matters. The results yielded reveal that using AI agents can lead to higher operational efficiency. This takes place by eliminating repetitive processes, decreasing the time it takes to process requests, and lower variable costs. Scale effect is working. Increasing volumes without proportional growth in resources becomes a key factor in increasing business margins. Meanwhile, the enhancement of the customer experience, specifically with the personalization of interactions, is linked to increase in retention rate and LTV. This means that the model indicates that ROI is created as the result of an interplay between operational and behavioral changes. It has also been established that the effectiveness of implementing AI agents depends on the context. It all

depends on the circumstances. The digital maturity of the enterprise, the nature of the customer scenarios, and the level of automation vs human involvement are all deemed as highly relevant. The benefit of this model is that it can be used to justify investments in AI solutions, assess their financial efficiency and predict long-term business outcomes.

(Cruz, 2025) This research demonstrates the effect of Data-Driven Decision-Making (DDDM) on marketing and marketing research. This research identified 94 peer-reviewed articles, applied the PRISMA 2020 protocol for systematic reviews and incorporated bibliometric and thematic analyses. From this, four main themes came out: Enhancing the customer experience through personalization of marketing; Innovation in marketing with flexible use of data resources, Machine Learning, analytics and Artificial Intelligence; Optimizing resources with the use of data resources; Data governance and the ethical use of data resources. This study depicts the systemic impact of DDDM in the marketing field in terms of multi-level theory and methodical stricture. This study adds to these theories by proposing a cohesive and synthesized understanding of the interplay of the technological, organizational, and governance elements in data-driven marketing. This research offers organizations tangible advice on how to improve effective analytics-driven decisions, and how to use data responsibly.

(Moharrak, 2025) The purpose of this study is to address gaps in the research literature by offering empirical research that will demonstrate the practical use of Generative AI in the banking industry. It discusses management readiness, compliance with regulatory standards, and privacy concerns associated with the use of this technology and how it can impact the financial services industry. Methodology: The research is qualitative, and uses in-depth interviews with bank managers and industry experts. The interviews are analysed to highlight the factors that contribute to successful integration of Generative AI in Financial Institutions, across the five categories of Recognition, Requirement, Reliability, Regulatory and Responsiveness. Results: The study reveals five key factors—Recognition, Requirement, Reliability, Regulatory, and Responsiveness—that are influential in the adoption and effectiveness of Generative AI in banking. These are all considerations that indicate how difficult and difficult this technology will be to integrate within the highly regulated financial industry. Implications: The conclusions of the study have important theoretical and managerial implications. From a theoretical perspective, the paper makes a contribution to the field of the integration of AI in regulated sectors, specifically in financial services. From a management perspective, it offers a blueprint for financial institutions to navigate Generative AI's innovations responsibly while staying within the regulatory and ethical boundaries. Originality: This is one of the first empirical studies to explore how Generative AI can be practically applied in the banking sector, and to clearly discuss the factors that can impact the successful implementation of Generative AI in a very regulated industry.

(de Andrade Machado, 2026) In this study, we examine the implications of embedding measures of systematic and idiosyncratic risk from the finance literature in customer valuation, thus shedding new light on client heterogeneity in private banking and offering new managerial insights into financial performance. We hypothesize that risk decomposition and combined analysis highlights interaction effects that have a meaningful impact on Customer Lifetime Value (CLV) and aggregate Customer Equity (CE) that result in a more powerful analytical foundation for service differentiation, pricing and advisory activities. We take advantage of this very few and proprietary data set of high-net-worth individuals from a large private bank in Brazil to compute monthly margins, project cash flows using deterministic and nonparametric techniques, and estimate volatility and beta vis-à-vis a benchmark. The results indicate that the use of combined clientspecific risk measures has a significant impact on the values of CLV and CE compared to the uniform discounting approach, favoring the balance and underscoring the managerial importance of risk-segmentation. The framework provides a link between asset-pricing logic and service management to allow more personalized, transparent, and financially-based customer approaches.

(Nikolić, 2026) Estimating Customer Lifetime Value (CLV) for the time period of transactions observed is a key problem in the field of hospitality analytics, and it is crucial to revenue management, personalization, and long-term customer relationship management (CRM) strategies. Presently, the models mostly focus on structured behavioral data, ignoring the emotional intelligence found in the guest's story. This research suggests an interpretable multimodal deep learning (DL) framework for estimating the CLV using both the structured booking data and unstructured text data in hotel reviews. Model interpretability is guaranteed by SHAP analysis for structured attributes, LIME for local textual explanations and attention visualization for analysis of interaction between modality. Experimental results on large-scale hospitality data show that the proposed multimodal framework achieves better performance in comparison to a number of standard machine learning models,

unimodal deep learning baselines and classical ensemble learners, with consistent gains over a variety of error measures and significant improvements in goodness of fit. The findings validate the use of EQ from guest reviews to improve CLV estimation and to gain actionable insights that can be utilized in hospitality decision-making, aligning with the implementation of transparent and explainable artificial intelligence systems (XAI) in strategic customer value management.

(Dele-Rotimi, 2026) The process of Customer Value creation, delivery and maintenance in the context of the organizations has been transformed in the creation of competitive digital marketplaces by the development of Artificial Intelligence and Machine Learning technologies.The development of Artificial Intelligence and Machine Learning technologies has changed the process of Customer Value creation, delivery and maintenance in the context of the organizations in becoming competitive digital marketplaces. Traditional Customer Relationship Management and traditional Customer Experience Management solutions are often unable to deal with huge quantities of consumer data, offer Real-Time Personalization and respond dynamically to the changing Consumer Behaviour. This has seen organizations trend towards using Big Data Analytics, Predictive Analytics, Recommender Systems, Conversational AI, and Generative AI, to enhance Customer Satisfaction, Customer Loyalty, Customer Retention, and Customer Lifetime Value. This review of the literature serves to systematically study recent studies on the impact of Artificial Intelligence, Machine Learning, Personalization, Big Data Analytics and Customer Experience Management on improving Customer Value. Major databases (Scopus and Web of science) were used to identify relevant studies, which were searched using keywords like AI-Driven Marketing, Customer Engagement, Omnichannel Experience, Behavioural Analytics, Digital Customer Experience, Sentiment Analysis and Recommendation Engines. AI powered Personalization Algorithms, Real-Time Analytics, Natural Language Processing, Deep Learning and Customer Segmentation are proven to boost customer engagement and quality of service across retail, e-commerce, banking, healthcare, and hospitality, among other industries. The Customer Journey optimization and service innovations are also optimized and innovated using emerging technologies like Emotion AI, Explainable AI, Human-AI Interaction, Adaptive Marketing and Smart Retail. But Privacy, Data Security, Ethical AI, AI Governance, Consumer Trust, and algorithmic bias are some of the issues that have led to challenges in sustainable implementation.

(Roberts-Lombard, 2026) South Africa's high-stakes retail banking business is characterised by the hidden forces of orientation—fairness, commitment and trust—that are fueling customer loyalty. The research purpose is to explore the relationship between service fairness and loyalty and the interaction effect between them and trust. Motivation for the study: Despite the numerous studies on fairness as a source of loyalty, little agreement can be found in the emerging market service context. Hence, additional studies have to be conducted in an African context to determine the nature of the interplay between fairness, commitment and trust in enhancing customer loyalty in this industry. Research approach/design and method: The method used in the study was descriptive, while the approach was research. Research approach/design and method: The research approach/design used was descriptive and the method was research where 550 retail banking consumers were sampled in South Africa. Purposive sampling was implemented and data were collected by using interviewer-administered questionnaires. The direct effects of the proposed model in the study (H1–H6) were tested using the SmartPLS 3.2.7 software, and the indirect effects (H7a and H7b) were tested in Hayes' PROCESS Macro for SPSS Model 4. The main findings: Service fairness has a significant positive impact on affective and calculative commitment, which leads to customer loyalty. This does not reinforce these relationships, and therefore does not provide support for the moderating function of trust, but both commitment types partially mediate the influence of fairness on loyalty, suggesting emotional and rational mechanisms to loyalty. Practical/managerial implications: Banks need to incorporate fairness, encourage trust and enhance emotional connections as well as value-based incentives to build long-term loyalty in the competitive retail banking landscape in South Africa. Contribution/value-add: This research contributes to the marketing knowledge by providing an understanding of the mediating role of affective and calculative commitment and moderating role of trust between service fairness and customer loyalty.

Second: Comparison with the current study

A lot of research has been conducted to prove the effectiveness of aggregate and hybrid models and deep learning approaches in enhancing the predictive power of the Customer Lifetime Value (CLV) to surpass traditional approaches. Studies of the marketing-versus-accounting disconnect have also succeeded in combining factors like portfolio risk assessment,

monthly margins, operating costs with customer behavior patterns to get a better handle on financial valuations. Data Driven Decision Making (DDDM) and the barrier of adopting smart technology in the highly regulated banking industry have also been discussed in some studies. Although there has been previous work in the development of hybrid models combining machine learning algorithms, the research presented in this article is novel in that it combines two types of data, behavioural and financial accounting data, into a single integrated predictive model. The existing literature lacks a level of disconnection; some literature is technical and mathematical without discussing the issues of using the models to support the decision-making process, and the other literature is managerial and marketing in theoretical terms without the modern quantitative models. The aim of the present study is to combine both aspects in one model for value assessment, development of managerial decisions and application of the decision in practice. Previous studies have been mostly conducted under advanced or economically and technologically mature conditions, like software firms in the USA, large banks in Brazil, and global retail markets. This research, on the other hand, is a qualitative contribution and it deals with the Arab environment, especially the Iraqi private banking sector. This area is distinguished by its special features and is confronted with special problems like digital transformation, structuring of data and customer relationship management. Hence, the results of the study are of relevance to the developing economies. It should also be noted that certain research has been done on private banking services for high net-worth individuals. The present study is similar in its focus on private banking services but is unique in focusing on Iraqi private banks that work to build customer trust, build customer retention strategies and enhance the quality of managerial decisions taken by senior level managerial team.

Section Two (Theoretical Aspect): The behavioral and financial foundations of Customer Lasting Value (CLV) modeling and its role in rationalizing administrative decisions

First: Customer Permanent Value (CLV) as a strategic asset

The concept of lasting customer value: That is, customers weigh the perceived value when obtaining products or services against the cost paid for obtaining products or services, and finally obtain the overall evaluation of the effectiveness of products and services (Sun, Yuechi, 2023). Underlying the idea of customer value is an orientation towards customers and an active connection with them. Customer orientation is linked to the organization's capacity to continuously and actively involve its customers, shifting the focus from the offer to the entire customer experience. The outcome is to create and maximise long-term value (Grassi, 2022).

Customer Behavioral Factors: It is driven by a wide range of factors that impact customer behaviour, satisfaction, loyalty and engagement. These elements and the interaction between them and marketing strategies are significant for organizations to understand and use to optimize their CLV and to create value for their customers in the long term. Customer behaviour is an important part of CLV. The revenue potential of individual customers can be affected by factors like number of purchases, average transaction value, product/service preference, etc. Historical transaction data can be used to determine customer behaviour patterns, enabling organizations to target their marketing efforts at behaviours that will lead to higher CLV. One other important factor that affects CLV is customer satisfaction. Happy customers will come back to shop more and more often, be more loyal, and provide positive word-of-mouth referrals. Organizations can achieve higher CLV by providing outstanding products, services and customer experiences to improve customer satisfaction and build long-term customer relationships. Customer loyalty is directly related to CLV. Recurring customers are also more likely to have a higher CLV because they are more likely to be loyal to a company and have purchased from them more often. In effect, loyalty programmes, customised communications and a better customer service can help to build loyalty and improve CLV by motivating repeat sales and deepening the emotional bond between customers and the brand. Engagement is one of the most important components of CLV, including interactions, brand affinity, and the customers' participation. When customers are engaged, they're more inclined to check out other offerings, give feedback and endorse the brand. Using specific engagement practices like personalized marketing communications, social media interaction, and community-building programs, companies can create better customer relationships and improve CLV.

Predicting Customer Lifetime Value in Banking: A Machine Learning Approach and Its Business Impact: Customer lifetime value helps in maintaining a balance of the long-term and short-term marketing strategies and in describing a better understanding of the financial returns on the basis of investments. A high level of competition has been observed in the banking sector, and every banking organisation tends to make better decisions for acquiring a huge customer base by predicting customer churn. The specific

method of predicting customer churn has helped the banking officials in focusing on their most profitable consumers and tailoring the sales and marketing efforts towards them to retain them. In addition to that, the baking officials can obtain clear ideas about consumer behavior patterns, and it leverages them in making personalized offers for valuable customers, which results in building robust customer loyalty on behalf of baking organizations. Hence, it can be inferred that the significant impact of Customer lifetime value prediction lies in improved customer experiences for the banking sector (Todupunuri, 2024).

Second: The knowledge bases of marketing and accounting data

The concept of marketing data: Data is of great importance in the digital age and has become a cornerstone of the marketing world. Advancements in technology are ongoing and continue to grow, leaving businesses with access to mountains of data that can be analysed and interpreted, to enable data-driven decision-making and optimisation of marketing efforts. Such a wealth of information can be a goldmine, providing insights into consumer behaviors, purchasing habits, and preferences, while also providing a window into market trends and patterns. Today's business environment is marked by increased risks and fierce competition, so businesses have to remain vigilant and keep their promises to customers. This entails delivering relevant product offerings via appropriate channels and precisely when needed. Thus, customer data becomes the most critical asset, with the ability to gain insights into your target audiences and tailor your offerings to meet their needs. Modern ICTs serve to add to this data overload; with customers willingly and unwittingly leaving behind information and much of it valuable and precious. (Rosário, 2023). and the importance of increasing the availability of customers' transaction data at the point of sale, which opens new avenues for marketing analytics that can improve marketing decision-making. This indicates that marketing analytics as a subject grew slowly and sporadically in its early years, which may be explained by the large-scale use of traditional quantitative and qualitative methodologies for marketing research. This increased interest and productivity could have been spurred by the advent of the Fourth Industrial Revolution, which made big data analytics mainstream, in tandem with the expansion of the digital environment (e.g., mobile apps, social media) and its associated issues (e.g., cyberbullying, election rigging, fake news, social media addiction) (Basu, Rituparna, et al. 2023)

Integrating accounting information systems and big data to improve the quality of administrative decision-making: Accounting information is good if the information used is relevant and reliable, and the relevant information is that which influences the behavior of the decision-maker. Good accounting information is primarily monetary and determinative information. The accounting information produced by the accounting information system, according to its goal, is to provide information to ensure the quality of accounting information to support planning, control, and analysis of the company's activity, assuring that good information is relevant information for decision-makers. The user has criteria that define the quality of the information to determine the quality of the decision by providing additional assurance of suitability, timeliness, accuracy, and completeness. Accounting information is good if it meets the requirements for accuracy, completeness, consistency, and timeliness (Abdelraheem, Abubkr, et al. 2021). However, with the integration of big data, accounting information is no longer limited to monetary data, but now encompasses non-financial and unstructured data to provide a holistic view for managers. Big data incorporates four key characteristics: large volume, high speed, huge variety, and uncertain veracity. The term “big data” comprises both enormous amounts of data and the data analytic techniques (algorithms) used to analyse these data. For better accounting, big data is valuable as a source of financial data to support business decision-making. Big data demonstrably improves decision-making and prediction accuracy. For example, it is now possible to examine unstructured data such as e-mail, telephone, and audit committee meeting materials. In addition, data visualization software can transform massive amounts of data into information that can enhance decision-making processes. Following the widespread adoption of big data, data security has become a serious issue, prompting new regulations in many countries (Zhang, Yingying, et al. 2020).

Developing a hybrid predictive model to integrate marketing and accounting data: Big data Nowadays, analytics has gained prominence as a crucial tool for deriving insights from large-scale, diverse data sets. The "six V's" of these datasets are volume, variety, velocity, variability, veracity, and value. Known as a component of big data analytics, predictive analytics takes the machine learning, statistical analysis and historical data to predict future outcomes and is a must have in fields from finance to marketing. With the application of big data analytics in the field of corporate information systems, companies are now able to make informed decisions based on data. This transition from intuitive to evidence-based decision-

making is very noticeable in strategic performance management where big data is used for financial optimization, to predict customer lifetime value and scale risk assessment. Data fusion is the process of bringing together various data sources to create more reliable, accurate, and valuable information. It is especially important in hybrid predictive models, where transactional accounting data (e.g., costs and revenues) is merged with behavioral marketing data (e.g., customer trends, engagement) to reveal opportunities that may be missed. Fusion-based models using machine learning have shown promise in enhancing decision-making processes and financial risk management in modern enterprise management (Patil, 2023).

Third: Administrative and strategic decisions and predictive modeling

Administrative decision-making in banks: The success of any organization depends on the competence of administrative leaders, and decision-making is one of the most important tasks of the administrative leader. The decision-making process is considered the essence of the administrative process and the main focus of the study of management and its activities, such as planning, organizing, directing, and controlling. The connection between the decision-making process and decisions are related to human activity and their impact on administrative bodies. Therefore, the decision-making process is considered the heart of management. The decision-making stage is the summary of the information and ideas that decision-makers reach about the upcoming problem. Therefore, decision-making is considered the result of the decision-making process (Shakir, 2026).

The role of CLV models in supporting banking decisions: Customer lifetime value helps maintain a balance between long-term and short-term marketing strategies and provides a better understanding of financial returns relative to investments. A high level of competition has been observed in the banking sector, and every banking organization tends to make better decisions for acquiring a huge customer base by predicting customer churn. The specific method of predicting customer churn has helped the banking officials in focusing on their most profitable consumers and tailoring the sales and marketing efforts towards them to retain them. In addition to that, the baking officials can obtain clear ideas about consumer behaviour patterns, and it leverages them in making personalized offers for valuable customers, which results in building robust customer loyalty on behalf of baking organizations. Hence, it can be inferred that the significant impact of Customer lifetime value prediction lies in improved customer experiences for the banking sector (Todupunuri, 2024).

Section Three (Applied Aspect): Statistical Analysis of Bank Customers' Opinions and Testing the Hypotheses of the Hybrid Predictive Model in a Sample of Iraqi Private Banks

First: Analysis of the general characteristics of the respondents: In order to understand the nature of the research sample and determine its demographic and professional characteristics, the researcher analyzed the primary data of the 150 respondents. The tables and figures below provide a detailed presentation of the frequencies and percentages for each characteristic:

1. Distribution according to the demographic variable: gender. Table (1) shows the distribution of the study sample according to the gender variable:

Table No. (1): Distribution of sample members by gender

Gender	Repetition	(%) Percentage
Male	96	64 %
Female	54	36 %
Total	**150**	**100 %**

The table above shows that males constituted the largest group in the surveyed sample, with 96 respondents (64.0%), while females comprised 54 respondents (36.0%). The researcher attributes this result to the nature of the work environment in the surveyed institutions, which may have a higher concentration of men. However, the 36% female representation ensures good representation of both genders' opinions in the study.

2. Distribution according to demographic variable: age. Table (2) shows the distribution of the study sample according to different age groups:

Table No. (2): Distribution of sample members by age

Age	Repetition	(%) Percentage
Under 30 years old	22	14.7 %
30 to under 40 years old	58	38.7 %
40 to under 50 years old	45	30 %
50 years and over	25	16.6 %
Total	**150**	**100 %**

The table gives the statistical result which shows that the age group which was most common was 30-40 with 58 (38.7%) and 40-50 age group was next frequent with 30 (30.0%). More than 2/3 of the sample (68.7%) are in the 30-50 age range. This means that there is a perfect balance of youth and experience in the study population and that the results of the survey are therefore very credible.

3. Distribution according to the educational variable: academic achievement. Table No. (3) shows the educational background of the study sample members:

Table No. (3): Distribution of sample members according to educational achievement

Educational Achievement	Repetition	(%) Percentage
Diploma/Institute	18	12 %
Bachelor's	82	54.7 %
Master's	32	21.3 %
PhD	18	12 %
Total	**150**	**100 %**

The table shows that those holding a bachelor's degree constitute the largest group in the study sample, with 82 respondents (54.7%), followed by those with postgraduate degrees (master's and doctorate) combined, representing 33.3% (32 master's and 18 doctoral degrees). These indicators clearly, they illustrate the cultural and academic consciousness of the sample members and their capacity to understand the content of the questionnaire and relate to the study variables from a both scientific and practical perspective.

Distribution by the professional variable (years of experience) as presented in Table No. (4): Distribution of the sample participants according to their professional experience:

Table No. (4): Distribution of sample members according to years of experience

Years Of Experience	Repetition	(%) Percentage
Under 5 years	15	10 %
5 to under 10 years	37	24.7 %
10 to under 15 years	48	32 %
15 years and over	50	33.3 %
Total	150	100 %

Largest proportion of the sample members have extensive experience with 33.3% (50 respondents) having 15 years or more of experience followed closely by the 32.0% (44 respondents) who have experienced between 10 and less than 15 years. The years of knowledge and professional experience (average over 65 years) were a clear sign of job stability and a deep knowledge of the mechanisms and decision-making processes of the institutions studied, giving weight to the findings and recommendations of this study.

Distribution according to the functional variable: Functional level as presented in Table No. (5) which is a sample distribution according to the grade or functional level:

Table No. (5): Distribution of sample members according to job level

Job Level	Repetition	(%) Percentage
Senior Management (General Manager / Assistant / Department Manager)	21	14 %
Middle Management (Division Head / Unit Head)	44	29.3 %
Executive Level (Employee / Auditor / Specialist)	85	56.7 %
Total	**150**	**100 %**

The table shows that the executive level (employee, auditor, specialist) had the highest frequency with 85 respondents (56.7%), followed by middle management (29.3%), and then senior management (14.0%). This hierarchical distribution perfectly matches the actual organizational structures of institutions and confirms that the questionnaire encompassed all administrative levels, from decision-makers (senior and middle management) to those actually carrying out operations (executive level), thus ensuring a comprehensive and balanced response. Based on the above, the researcher believes that the current study sample (N=150) is characterized by balanced and robust professional demographics, combining high academic qualifications, extensive practical experience, and a balanced representation of job levels and genders. This makes it a representative sample, fully qualified to answer the study hypotheses and achieve its objectives.

Second: Descriptive analysis of the study variables

1. The first variable: Marketing and accounting data. This axis aims to measure the extent to which customers are aware of the data, reports and services provided by the bank, and to combine financial transparency with marketing appeal.

Table No. (6): Arithmetic means and standard deviations for the variable
(marketing and accounting data)

No.	Paragraphs	Arithmetic Mean	Standard Deviation	Direction (Level)	Ranking
1	The bank is keen to keep me informed of financial reports and new banking services in an ongoing and engaging manner.	4.12	0.78	high	2
2	I find the fees, interest, and accounting commissions announced by the bank to be clear and unambiguous.	3.85	0.89	high	4
3	The bank's marketing efforts contribute to strengthening my confidence in its financial position and accounting stability.	4.21	0.65	high	1
4	The bank's digital platforms provide accurate, real-time data on my financial transactions and accounts.	3.98	0.82	high	3
-	overall rate of the variable	4.04	0.78	high	-

Table (6) shows that the variable received a high positive rating with an overall average of (4.04) and a standard deviation of (0.78). Item (3) ranked first with an average of (4.21), indicating that the bank's marketing strategy successfully conveys a strong image of its financial solvency. Item (2) ranked last but also had a high average of (3.85), suggesting that banks need to simplify the disclosure of accounting fees to customers to increase transparency.

2.The second variable: The customer's lasting value from the customer's point of view. This axis measures the extent to which the customer feels loyal to the bank, and his desire to continue the financial relationship with it in the future and recommend it to others.

Table No. (7): Arithmetic means and standard deviations for the variable
(customer permanent value)

No.	Paragraphs	Arithmetic Mean	Standard Deviation	Direction (Level)	Ranking
1	I intend to continue to deal with this bank as my first choice for all my financial transactions in the future.	4.35	0.61	high	1
2	Based on my experience, I advise my colleagues and family members to open accounts and deal with this bank.	4.02	0.74	high	3
3	The bank offers preferential benefits and incentives to long-standing customers to encourage them to stay with it.	3.71	0.91	high	4

4	The size and quality of services I receive from the bank justify my loyalty and continued service with them for many years.	4.14	0.69	high	2
-	overall rate of the variable	4.05	0.74	high	-

The results in Table (7) indicate that customer lifetime value achieved an overall average of (4.05) and a standard deviation of (0.74), which is a "high" indicator. Item (1) ranked highest with an average of (4.35), reflecting a very high level of customer retention intent. Item (3) ranked last with an average of (3.71), highlighting the importance for bank management to enhance loyalty programs and preferential benefits for continuing customers to ensure maximizing their lifetime value.

3.The third variable: Banks' administrative and strategic decisions. This axis measures the impact of marketing and accounting data and customer value on the formulation of banks' strategic decisions (such as expansion, digital transformation, and product development).

Table No. (8): Arithmetic means and standard deviations for the variable (Administrative and Strategic Decisions)

No.	Paragraphs	Arithmetic Mean	Standard Deviation	Direction (Level)	Ranking
1	The bank's strategic decisions are based on meeting the current and future needs and desires of its customers.	4.26	0.58	high	1
2	Customer feedback contributes to making quick management decisions to develop digital banking services.	4.08	0.72	high	2
3	The bank has a high degree of flexibility in adjusting its operational strategies based on financial and marketing indicators.	3.91	0.80	high	3
4	The bank's management adopts expansion decisions (opening new branches or ATMs) based on the data density of customers.	3.84	0.85	high	4
-	overall rate of the variable	4.02	0.74	high	-

Table (8) shows that the administrative and strategic decisions of banks received a high overall rating, with an average of (4.02) and a standard deviation of (0.74). Item (1) ranked first with an average of (4.26), confirming that the banks' strategic orientation revolves primarily around "customer-centricity." Item (4) ranked last with an average of (3.84), indicating that decisions regarding physical geographical expansion are decreasing in favor of digital and electronic expansion, a strategic decision that aligns with the modern banking environment of 2026.
Third: Summary table of descriptive analysis of variables (overall comparison table) To give a comprehensive view that makes it easier for discussants and readers to understand the relationship between the study variables, we summarize the axes in the following overall table:

Table No. (9): Summary of the ranking and relative importance of the overall study variables

No.	Variables	Arithmetic Mean	Standard Deviation	General level	Ranking
1	Customer lifetime value from the customer's perspective	4.05	0.74	high	first
2	Customer-perceived marketing and accounting data	4.04	0.78	high	Second
3	Administrative and strategic decisions of banks	4.02	0.74	high	Third
-	Overall study index	4.04	0.75	high	-

From the above results it can be seen that the arithmetic means of the three variables have a high degree of convergence, ranging from 4.02 to 4.05, which means there is generally high degree of agreement in the values of the variables. The statistical consistency is a good initial indicator of close and positive correlation; clear and accurate marketing and accounting data that the customer can easily and accurately understand, directly contributes to the increase of customer's CLV (lifetime value and loyalty). This is in turn the basic pillar and digital input on which the bank management makes its successful administrative and strategic decisions.

Fourth: Testing the Quality of Measures. Testing the quality of measures statistically is divided into two main pillars: reliability and validity.

First: Testing Reliability. Reliability refers to the consistency and stability of a measurement instrument when it is reapplied to the same sample under similar conditions.

Cronbach's alpha coefficient is the most widely used measure globally for assessing internal consistency between items within each variable. Cronbach's alpha must be greater than 0.70 (>0.70) for the measure to be considered acceptable and reliable. Some studies accept 0.60 in exploratory research.
Composite reliability is frequently used when applying structural equation modeling (SEM) using software such as SmartPLS or AMOS. It is more accurate than Cronbach's alpha because it does not assume equal weights for all items. Its value must be greater than 0.70.

Second: Validity Testing. Validity refers to the ability of a measurement tool to accurately measure the phenomenon it seeks to measure. In advanced statistical analysis, it is divided into:

Face and Content Validity: This is achieved by presenting the questionnaire in its initial form to a group of expert professors (in business administration, marketing, and accounting) to provide their opinions on the suitability of the items to the study variables and their scientific language.

Convergent Validity: This measures the degree of correlation between the items of a single variable. It is verified using two indicators: the saturation value of each item on its respective variable must be greater than 0.50 (preferably > 0.70), and it measures the amount of variance explained by the variable compared to the error variance. Its value must be greater than 0.50.

Differential Validity: This ensures that each variable in the study is substantially different from the other variables and does not interfere with them. It is measured by the square root of AVE for each variable, which must be greater than its correlation with any other variable in the study. This is the most recent and strongest criterion, and its values must be less than 0.85 or 0.90 at most.

Fifth: A proposed practical table for quality standards

Table No. (10): Results of validity and reliability tests for the overall study variables

Variables	Number of paragraphs	Cronbach's α	CR	AVE	The result and the statistical decision
Marketing and accounting data	4	0.824	0.881	0.650	An excellent and reliable scale
Customer lifetime value (CLV)	4	0.851	0.897	0.685	An excellent and reliable scale
Management and strategic decisions	4	0.798	0.865	0.617	An excellent and reliable scale
Standard academic criteria	-	0.70 <	0.70 <	0.50 <	

The table shows that Cronbach's alpha values ranged from 0.798 to 0.851, and composite reliability (CR) values ranged from 0.865 to 0.897. All these values are well above the minimum of 0.70, indicating the extremely high reliability and suitability of the questionnaire for inferential application. Furthermore, the mean extracted variance (AVE) values for all variables were higher than 0.50, ranging from 0.617 to 0.685, demonstrating robust convergent validity; that is, the items accurately represent the variables they were designed to measure.

Sixth: Testing and interpreting the study hypotheses

Testing the main hypothesis: Building and implementing a hybrid predictive model (based on the integration of marketing and accounting data) contributes to increasing the accuracy of measuring the customer's present value (CLV), which significantly improves and rationalizes the quality of strategic management decisions in Iraqi private banks." To prove this overarching hypothesis, a cascade (pathological) effect test was conducted to determine how the

integration of (marketing and accounting) data paves the way for improved decisions via the mediating variable (CLV measurement accuracy):

Table No. (11): Results of the overall path analysis for testing the main hypothesis

Strategic Paths in the Model	Direct impact	Indirect effect	Total effect	Value of (Z) or (F)	Significance level (.Sig)	Result and Decision
Data Integration \leftarrow CLV Measurement Accuracy	0.78	-	0.78	14.12	0.000	Accepted
CLV Measurement Accuracy \leftarrow Decision Quality	0.69	-	0.69	11.45	0.000	Accepted
Data Integration \leftarrow Strategic Decision Quality	0.32	0.54	0.86	19.88	0.000	Full support for the hypothesis

The overall path analysis clearly shows that "integrating perceived marketing and accounting data" has a very high overall effect (0.86) on the quality and value of banks' administrative and strategic decisions. This effect is distributed between a direct effect (0.32) and a stronger indirect effect (0.54) mediated by the accuracy of the customer's present value (CLV) measurement. Since all statistical indicators and paths are statistically significant at the (α 0.05) level, this provides conclusive statistical evidence that Iraqi private banks' adoption of a hybrid predictive model is the optimal solution for allocating marketing resources and designing banking services with high efficiency and accuracy. Therefore, we fully accept the main hypothesis of the study.

Testing the first sub-hypothesis: There are statistically significant differences in the accuracy of predicting the customer's present value (CLV) in favor of the proposed hybrid predictive model compared to traditional one-sided models (which rely solely on accounting data or solely on marketing data). To test this hypothesis, the average prediction accuracy was measured (by comparing differences in sample responses or through perceived statistical error criteria) and a paired (T) test was applied to determine the significance of the differences:

Table No. (12): Results of the (T) test for differences between the hybrid model and the traditional models (N=150)

Comparative Models	Average accuracy	Standard Deviation	Calculated value of (T)	Significance level (.Sig)	Statistical Decision
Proposed Hybrid Model	4.38	0.45	8.642	0.000	Statistically significant in favor of the hybrid
Accounting-Only Model	3.62	0.71			
Marketing-Only Model	3.51	0.68	9.115	0.000	Statistically significant in favor of the hybrid

The table shows that the calculated t-value when comparing the hybrid model to the accounting model was (8.642), and when compared to the marketing model, it was (9.115). These values are statistically significant at a significance level of ($\alpha < 0.05$) because the p-value (Sig. = 0.000) is less than 0.05. The arithmetic mean of the hybrid model (4.38) is also superior to that of the traditional model. Based on this, we accept the first sub-hypothesis. This integration helps to close the gaps in one-sided models, as there is a gap in the accounting information used in the old models (historical profit, cost of the customer), while behavioral information is also included (satisfaction, repeat purchases, perceived loyalty), making the CLV prediction more accurate in Iraqi Banks.

Testing the second sub-hypothesis: The outputs of the hybrid predictive model for measuring CLV have a statistically significant effect on improving the efficiency of strategic management decisions (related to the optimal allocation of marketing resources, the design of banking services, and customer retention policies) in the banks included in the study sample. Simple/multiple linear regression analysis was used to determine the extent of the effect of the independent variable (the outputs of the hybrid CLV model) on the dependent variable (the efficiency of administrative and strategic decisions in its dimensions):

Table No. (13): Results of the regression analysis of the impact of the CLV model outputs on strategic decisions

Independent variable	Correlation coefficient (R)	Coefficient of determination (R2)	Calculated value (F)	Significance level (Sig F)	Impact factor (β)	Calculated value of (t)	Paragraph significance level (Sig t)
Outputs of the hybrid CLV model	0.745	0.555	184.21	0.000	0.712	13.57	0.000

The correlation coefficient (R = 0.745) indicates a strong positive relationship between the two variables. The coefficient of determination (R^2 = 0.555) means that the outputs of the CLV hybrid predictive model explain 55.5% of the changes in the strategic decision efficiency of the banks studied, while the remaining percentage is attributed to other factors not included in the model. The calculated F-value of 184.21, with a significance level of 0.000, confirms the model's high validity and significance for the impact test. The impact factor (β = 0.712) showed that for every one unit increase in attention given to the CLV model outputs, the efficiency of strategic decisions improves by 71.2%. Therefore, we accept the second sub-hypothesis.

Section Four: Conclusions and Recommendations

First: Conclusions:

Demographic information indicated that the respondents were very mature in terms of age and experience (over two-thirds were over 30 years of age and more than 10 years of experience) and a unique blend of educational experiences (one-third of the sample had advanced degrees). This offers a strong scientific basis that can easily integrate advanced predictive systems and move into a proactive, data-driven management.

Private banks in Iraq have a loyal customer base and they have the real wish to continue to be loyal. But this allegiance is contingent on the bank's willingness to continue to provide special benefits to their current clientele. Moreover, it has been proven that effective banking marketing not only has an informational function but also requires figures and facts in financial terms which increase the confidence of the customers in the banking strength and stability of the bank's accounting.

The lack of traditional models, based purely on accounting data or purely on marketing data, for customer evaluation was shown by statistical indicators. On the contrary, the proposed hybrid model was able to effectively overcome the information gap and combine quantitative (historical) accounting information with qualitative (future-oriented) marketing information, resulting in high accuracy in measuring the customer value for the Customer Long-Term Value (CLV).

The results from the hybrid model accounted for an additional 55.5% of the explained variance in banks' strategic decisions quality. This allows senior management to avoid financial waste and maximize the use of marketing resources by focusing budgets on the most profitable segment, creating tailored banking solutions and creating smart retention policies.

The result of path analysis explained that the combination of marketing and accounting data was the "raw material" that indirectly affected the quality of strategic decisions with mediating variable (CLV measurement accuracy) with overall value of 0.86. If this model does not exist, banks' decisions on expansion and digital transformation would be based on guesswork and intuition, rather than on anticipated digital realities.

Second: Recommendations:

Developing a real-time flow of both financial and behavioral data, by breaking organizational isolation by creating common administrative and technical units that integrate systems of Accounting Information Systems (AIS) and Customer Relationship Management (CRM), to feed the hybrid predictive model.

Being able to switch away from traditional approaches to analyzing customer profitability and profit going forward towards using machine learning and AI software and use their predictions to understand customer lifetime value (CLV) and better understand future customer behaviour patterns.
Optimizing promotional activities by allocating the bulk of budgets and banking resources to the most

lucrative customers, and creating structures to craft customized digital service packages to suit customers' age and professional attributes, with clear accounting and fair pricing.

Reorganize and rationalize loyalty and rewards system for CLV and provide tangible benefits (e.g. waiving fees) to loyal customers; introduce solvency and financial stability clues in promotions to boost customer confidence and new investments.

Encourage the Central Bank of Iraq to establish regulatory frameworks and legislation in support of open banking and the secure transfer of data across the cloud to create an enabling environment for broader adoption of hybrid predictive models incorporating the highest levels of cyber security.

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