EVOLVING DIMENSIONS OF CUSTOMER PROFITABILITY ANALYSIS WITH EMERGING PREDICTIVE TECHNOLOGIES

Abstract

The importance of customer profitability analysis (CPA) across sectors and domains is increasing daily. Primarily based on historical data, it has evolved due to the capture of real-time data, the adoption of AI tools, and, more recently, increased support from predictive analytics. In the future, it is possible that only service organisations, manufacturers, and other entities can effectively perform CPA by deploying and using AI tools in the CPA process, as this analysis can be more agile and nimble in meeting the marketplace's requirements. Real-time capture of data points has made predictive analytics a key tool to help management retain profitability, market share, and growth in the task of practical CPA analysis. It allows the long-term survival and development of the entities. This paper examines the relationships between CPA and how predictive analytics will support it in the future.

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INTRODUCTION

The importance of CPA in today's business across various sectors cannot be overemphasised. With growing competition and increasing price pressures forcing entities to operate on thin margins, this need is emerging as a mandatory imperative to sustain profitability and achieve long-term growth. Coupled with investor pressures to generate profits, decent dividend payments to shareholders, and reasonable returns to investors, the changing dynamics of the current market situation are making the Management Information System a part of all major entities and sectors. This study brings out the importance and relevance of CPA for entities today.

OBJECTIVES OF STUDY

a. To understand the Role played by Customer Profitability Analysis (CPA) in today's business and its importance

b. To demonstrate how industries use CPA to cut costs, lift margins, and sustain growth—powered by predictive analytics.

c. To create a generic framework for the effective implementation of Customer profitability analysis for different industries in India using

AI tools that can be applied across industries

REVIEW OF LITERATURE

Customer profitability prediction has become a vital area of research as businesses face increasingly competitive markets. Chen, Guo, and Ubakanma (2015) address this by employing a dynamic systems approach to forecast customer profitability. Their method uses cluster analysis to develop RFM (Recency, Frequency, Monetary) score-based time series from transaction records. Profitability is then modelled through multilayer feedforward neural networks, trained on real online retail data from the UK, to capture shifting patterns of customer profitability. Nwabekee, Aniebonam, and colleagues (2021) expand on this perspective by emphasising the importance of cultivating long-term relationships in the retail and service sectors. They propose a predictive model powered by machine learning (ML), artificial intelligence (AI), and advanced analytics to uncover consumer behaviour trends, preferences, and buying patterns. Findings show that tailored recommendations, dynamic pricing, and optimised reward programs can significantly enhance customer retention and financial outcomes. In the insurance sector, Fang, Jiang, and Song (2016) introduce a methodology using random forest regression, a Big Data technique, to predict client profitability. By factoring in liability reserves alongside past purchasing and expected future cash flows, they highlight customer demographics and insurance attributes as critical variables. Their results demonstrate that random forest outperforms conventional forecasting methods in accuracy. Earlier, Gurău and Ranchhod (2002) emphasised the strategic necessity of measuring and managing customer profitability to withstand intense competition. They suggested frameworks that link customer satisfaction measurement to profitability forecasting, emphasising its role in long-term business viability. Recent contributions have highlighted the broader applications of predictive analytics. Ezeife, Eyeregba, and colleagues (2024) propose that small businesses can now adopt cloud-based predictive analytics at relatively low cost, minimising risks and enhancing decision-making. Their work underscores the importance of cultivating a data-driven culture and investing in workforce training to build analytical capacity. Similarly, Adekunle, Chukwuma-Eke, and others (2021) focus on operational efficiency, noting how predictive analytics powered by ML reduces delays, resource misallocations, and costs, enabling more flexible and intelligent decision-making frameworks. Agu, Chiekezie, and co-authors (2024) present cross-industry case studies to showcase the transformative potential of predictive analytics. In healthcare, predictive models improve resource allocation and patient outcomes. In financial services, they enhance fraud detection, credit evaluation, and personalised offerings. Within industrial settings, predictive maintenance and supply chain optimisation increase efficiency and profitability. Collectively, these examples demonstrate the role of predictive analytics in boosting sustainability, mitigating risks, and supporting strategic, long-term growth. Overall, the literature illustrates predictive analytics as a cornerstone for profitability forecasting, customer satisfaction, and sustainable business practices across industries.

METHODOLOGY

The study uses an exploratory methodology. After reviewing past studies and considering emerging tools and technologies, the author proposes to develop a new framework for a generic model to perform Customer Profitability Analysis.

DISCUSSION

a) To understand the Role played by Customer profitability Analysis(CPA) in today's business and its importance

While profitable customers are to be kept and nurtured the rest are used as fillers for volume or dropped by, and as the cost of obtaining a new customer is more than retaining an existing customer, with activities creating costs, it becomes imperative to find out the unprofitable customers and eliminate or gradually ease them out of service, by suitably pricing the products and services, phasing out of specific products or imposing certain additional costs for the customers in a careful and calibrated manner. Consulting majors like KPMG, EY, PwC, Deloitte, etc., continuously monitor their customer profitability and follow a strategy of overquoting or underquoting, depending on the project's profitability, past experiences with the client, and associated risks. CPA is thus a function of past experiences, risks, typical customer needs versus costs, and the industry in which they operate. In

particular, today it is most relevant in industries as diverse as Airlines, Banking and Insurance, Manufacturing, Retail, and services, where a large number of transactions occur daily, giving rise to Big data that needs to be captured and interpreted meaningfully for informed decision-making.

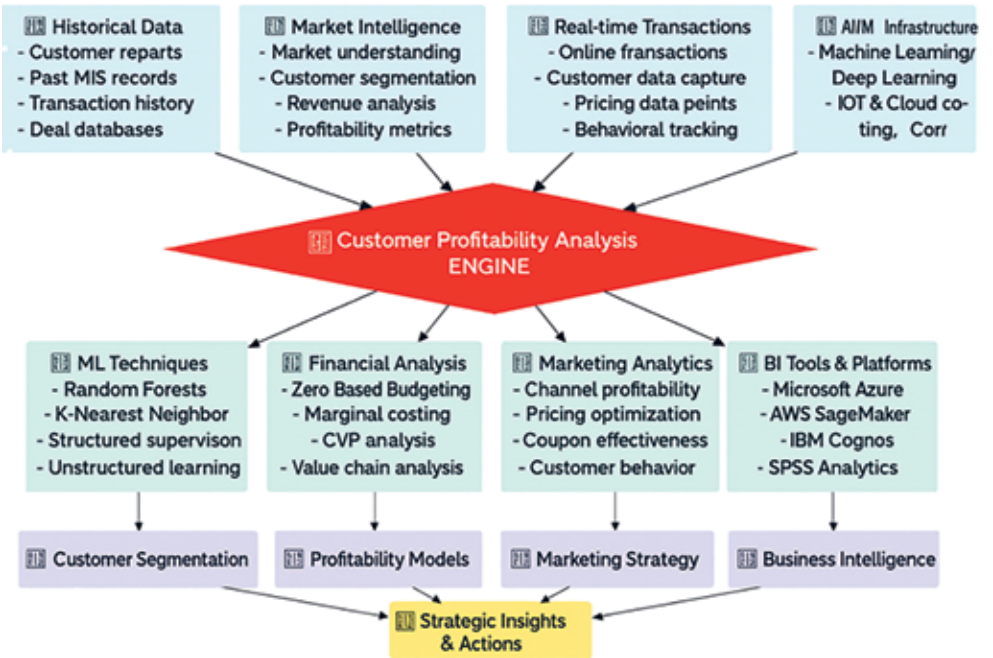
b) To demonstrate how industries use CPA to cut costs, lift margins, and sustain growth—powered by predictive analytics

Customer Profitability Analysis (CPA) has become a core management tool for product leaders, CXOs, marketing, and finance to sharpen profit planning. Regulatory scrutiny and market expectations make CPA-driven product continuation or exit decisions even more critical for listed companies. Equally important, customers must be cultivated for the long term to make marginal accounts profitable—an outcome that depends on a disciplined CPA grounded in an organisation's MIS: costs, revenues, regional mix, collections, delinquency trends, and more. Traditional batch reporting, or "last year + x%," budgeting, no longer suffices. Firms need to capture, integrate, and analyse data continuously, reviewing history, monitoring current operations, and ingesting new transactions in near real time. This is especially true in BFSI, retail, airlines, and hospitality, where data volumes are high and scattered across systems. Many legacy ERPs and MIS lack tight real-time integration, prompting companies to adopt a new data approach that integrates operational feeds, device and sensor signals, and customer interactions into unified analytical pipelines.

Modern analytics and automation can sift large datasets, highlight drivers of customer value, and deliver concise, actionable reports for decision-makers. In the Industry 4.0 context, these capabilities are increasingly accessible through cloud platforms and flexible commercial models (e.g., SaaS, pay-as-you-go variants), allowing organisations to scale with budgets. Predictive analytics adds a forward lens, linking customer behaviour and profitability to long-range planning and strategic choices. Evidence from practice shows benefits for both large enterprises and SMEs. Given SMEs' outsized role in India's employment, GDP, and regional balance, upgrading to predictive, continuous CPA is no longer optional—it is foundational to product portfolio discipline, profitable customer engagement, and durable growth.

c) To create a generic framework for effective implementation of Customer profitability analysis for different industries in India using AI tools that can be applied across industries.

Diagram-1- Flow diagram for CPA for entities – A generic approach



Source -Author's contribution

In the above diagram, CPA is performed using the master database at the entity level, along with market understanding of key customers' behaviours and past experiences, while capturing data points from online transactions using various tools and AI applications. While conventional accounting and budgeting tools continue to constitute a fundamental component of organisational practice, their capacity to remain effective is increasingly constrained by rapidly evolving business environments. Such tools are often inadequate in producing timely insights or in supporting advanced predictive analytics relating to costs, revenues, investments, and customer-specific profitability. Consequently, a critical transition towards the adoption of artificial intelligence (AI) and machine learning (ML)–based tools and algorithms, specifically designed to address the requirements of individual entities, becomes imperative This generic model can be applied across diverse industries with some tweaking or changes to factor in the inputs and data points arising in the process using the IOT sensors, AI interface tools, etc, which can significantly help to get effective and validated data on CPA for management decisions. For strategic insights into the future, it is desirable to utilise predictive analytics and tools that can be readily integrated using apps on a plug-and-play or subscription model basis, to process and integrate data for final solutions to be implemented by top management.

The following table (annexure-1 below) lists tools and techniques for Predictive Analytics in CPA.

Top Predictive Analytics Tools for Customer Profitability Anlyis

	SAP Analytics Cloud Real-time diata inodeling, profitability forecaeling, integration with ERP & CKM
	SAS Vlya Advanced ML models, customer gegmentation, chunh prediction anlysis
	Altaryx Code-free predictive workflows, real-time data blending, profitabil ty analysis
	RapidMiner ML pipelities, customer lifetimg value (CLV) modeling, real-time scoring
	IBM SPSS Statistical, medeling, regression analysis, customer behavior prediction
	TIBCO Spotfire Real-time (sua). analytics, profitability heatmaps, customer segmentation
	Microsoft Azure ML Scalable ML models, integregation with

Source – Author's Contribution

LIMITATIONS OF STUDY

This study is exploratory, does not consider any empirical data, and is not empirical in nature.

CONCLUSION

CPA is crucial in today's industry and commerce across various entities. Over the years, with access to technologies and emerging dimensions, it will be imperative for enterprises to adopt them so that their long-term profitability, survival, and growth can be adequate and sustained. Currently, organisations are increasingly adopting advanced tools, while enterprise resource planning (ERP) systems are being customised to facilitate the periodic generation of CPA reports. In practice, these systems often incorporate limited manual adjustments, which, based on experience, have proven to be a more cost-effective approach than fully tailoring CPA reports for each individual entity. MA

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