



International Journal of Emerging Trends in Information & Knowledge Management
<https://www.eurekajournals.com/knowledge.html>
ISSN: 2581-3579

Special Issue: "Transcending Tech Ed Nexus: Advancing Education through Technological Integration" - 12th June-2024

Transforming Banking Services: Artificial Intelligence Impact on Customer Experience

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Abstract

Monetary globalisation has enhanced the productivity of the banking sector, resulting in an unpredictable and risky financial environment. Banks are gradually adopting state-of-the-art technologies, such as artificial intelligence, to enhance customer experience and boost the quality of responses to consumer complaints. This study examines the critical role that the banking sector plays in the expansion of businesses, the application of AI banking practices, and the enhancements in customer service that result from investigating various AI applications, which include credit scoring, mobile banking, customer relationship management, and fraud detection.

This study illustrates how technology may boost financial stability by tackling shortcomings. AI integration raises operational competence and customer satisfaction and creditworthiness, both of which will ultimately result in economic development. The study's discussion highlights how artificial intelligence (AI) has the potential to completely alter the banking sector and how ongoing technological advancements are required to maintain the sector's adaptation and growth.

Introduction

Banking and the national economy

According to Ghodselahi and Amirmadhi (2011), banking is an incomparable business that uses capital to calculate money regardless of probability. A nation's banking establishment has a large power on its economic system (Park, 2012), fiscal stability and sustainable development (Gutierrez et al., 2009). In order to apart the utilise that are really helpful from the rest, banks demand carefully analyse their loan process operations. A solidified loan application procedure will aid banks in demoralising the approval of loans for loss making undertaking that could yet result in non-performing assets and will ease the process of allocating loans to the appropriate projects.

According to park 2012, lending wealth to disappointed projects is a sign of uneconomical resource use which has an effect on the performance of the banks and the country's economic

improvement. Acknowledged that one of the banks duty is lending, any failure in this area would have a important negative outcome on the banks.

Moreover, banks are necessary to lend money to the borrowers in order for them to sort money (Ince & Aktan, 2009) which will aid in the increase of industrial, financial and economic improvement activities (Ceteorelli & Gambera). in addition in the event of a bank juncture, the availability of bank loans will forcefully decline, resulting in a lessening in the amount of loans that the bank offers (Hubber, 2018).

Over three fourth of all the assets in the banking industry in India are handed over by public sector banks. 17% of all commercial bank assets are held by SBI (Goldberg,2009). If the bank has a majority portion in the market, it can provide loans to the people and business in lieu of their needs. The economic world's ability to grow and create jobs will be hampered by the banks leading to high interest rates, aiming for higher profits and reducing the amount of loans that there are going to offer. As a result of all this things unemployment rate is going to ride in the economy (Feldmann,2015)

Moreover, the initial payment will be greater in the banking sector if the entry obstacle is high. Foreign banks will be unwilling to visit as a consequence of a high interest rate that will be imposed in order to turn a profit (Claessens & Laevan, 2005). The monetary system worth of the output produced by diffreent business within a nation during a limited period of time is measured by GDP as a measure of economic improvement (Atay & Apak, 2013). Increased output from the financial sector has a real impact on GDP estimate (Oulton,2013). in order to assist economic activity and alter the banking sector steadily, non-performing assets should be recovered (Tan & Floros,2012).

The Global reach of Banking Systems

Due to their global enlargement, banks are essential for keep in the stability of an economy in the time of crisis (Goldberg,2009).decreased competition in the banking sector will have an effect in high operating costs and service delivery, which will lessen the need for external funding and drawn down industrial expansions (Claessens & Laevan, 2005). Financial systems are merged globally as a effect of banks foreign divisions. Due to their global scope, banks will be able to ease transactions between the nations and close any gaps left by local banks, which will improve customer service (Goldberg, 2009). Because banks and other financial institutions are highly competitor, industries that trust more on outside funding will grow up at a quicker rates (Claessens & Laevan, 2005). a banking institution is a critical source of capital that a business can obtain from external investor to aid their operations (Campiglio, 2016).

Recession in the banking sector

The bank scheme will crash when depositors take money out of the bank because they think it to be uncertain. Whether things are regular or in a juncture, banks finds it difficult to operate without deposits from consumers (Kunt et al., 2000).when financing their money, depositors are continually on the lookout for well run banks with grater interest revenue enhancement

(Goldberg,2009). a state will cause a acute decrease in bank loan issues and bank assets value, which will open the door for lower output and slower investment growth.

The rise of yield volume during the crisis period and the year after is wedged by the crisi. A few years into a situation, output growth can be accumulated, however bank credit development may nit be feasible to bring back in that time frame. If there is a bank crisis, the sum of loans that the banks provide t the borrowers will be forcefully reduced (Huber, 2018). During a crisis, banks will provide interest rates on deposits, following the crisis, they will proceed to maintain active deposits and get new ones. (Kunt et al., 2009).

According to Haslag 1995, there is a negative correlation between the rising price rate and yield growth and the inflation rate is reciprocally relative to the company's output. To promote consumers to make deposits, the interest should be higher than the rate of rising prices even in the event of rate hike. However there is no information that banks have offered an involvement rate higher than the rate of inflation nor there is a evident change in interest rates before and after a juncture. The central bank and its regulators will need to help the banks that have kept their liquidity even after depositors have taken their money out.

Quality of Service and customer experience

Consumers are keen to use the newly introduced goods and services the banks have advanced in order to accelerate banking procedure (Laketa et al., 2015). The accomplishment of the bank and how it sets itself separately from its customers are assesses based on their calibre of facilities provided to the clients. Customer satisfaction is an acute metric for measuring organisations performance because it regulated the organisation existence and success in a ruthless market. This is especially true for retail banking, which rest on customer's loyalty to operate gainfully by attracting new customers and retaining current ones (Dahari et al., 2015). The widespread of consumers are disappointed with banks financial services, despite the organisations more significant efforts. Owing to improved competition in the banking industry, banks have made pains to improve the quality of their services in reply to consumer needs and to deepen their contributions in a dependable manner (Johnston, 1997).

In direction to appropriately serve each user, business currently need divide up their clients into clusters based on the diverse needs of each group has. To completely know customers and offer them with better facility, it is essential to keep a sense of their behaviour (Samala & Sateesh, 2020). In order to holding existing customers in the aggressively competitive market by recognizing and understanding their needs, the customer relationship management procedure trusts the marketing policy with internal business process and external network influences. Focusing on four key components will enable banking organisations to efficiently use customer relationship organisation to improved function their customers:

- Trust current customers
- Representation in new customers
- Enlightening customers about the bank's new contributions and stimulating them to work carefully with them (Laketa et al., 2015).

Furthermore, if the banking sector pleases retail investors well, it can rise the amount of payments that they create (Puri & Rocholl, 2008).

Technology and the Banking Process

Lots of people use banking facilities every day comprising of credit cards, automated teller machines (ATM's), online banking and banking apps. What's prominent is that this number is increasing (Sundarkumar & Ravi, 2015). This type of service is labour intensive and time consuming. The process is tangled in accommodating deposits, approving loans and transferring money which is essential for a large number of employees in conventional banking system, however internet banking has totally altered this, since it uses information technology to sort transactions easier and faster.

Internet banking is transforming the banking industry through offering banking goods through a range of channels, such as ATMs as well, services for online banking, mobile banking, and others. It is crucial to serve clients with better service and maintaining long-term relationships. The internet has made it attainable for many e-banking products, namely debit cards, credit cards, and ATMs. This led to greater competition in the monetary and banking services industry. E-banking has lowered entry barriers, made products accessible to users globally, and saved time for bank managers and customers through the use of technology and communication. Paperless work has taken the place of traditional paper work through e-banking (Atay & Apak, 2013).

Artificial Intelligence's Scope and Application in the Banking Industry

Credit Rating

Only after carefully reviewing the credit scores of the individuals making loan requests should banks be ready to approve loans (Eletter et al., 2010). Because it handles and maintains a tab on risk, the banking industry is beneficial regardless of the level of risk. Since it is difficult to bounce back from a systemic collapse as a whole, the risk of financial instability is one of the most important of all the hazards (Ghodselahe & Amirmadhi, 2011). This category distinguishes between a functioning score with a high chance of not defaulting and an inadequate score with an elevated probability of failing. A method that artificial intelligence has used to solve issues with classification is the decision-tree methodology that is used to create model for trees of both regression and classification.

This approach yields better credit score evaluation results than discrimination analysis and logistic regression (Ince & Aktan, 2009). The choice of whether or not to grant a loan is critical since it effects the bank's marketing strategies and earnings. The employment of different lending strategies by rivals banks and frequently occurring variations in client borrowing patterns complicate this decision. According to the applicant's credit risk, the loan application might be classified as either positive or negative. A positive credit risk indicates an increased probability of loan default.

Conversely, a low likelihood of loan default is denoted by a negative credit risk. Even with an abundance of client data, the bank management should make an informed choice about either to

approve applicants with a negative risk for credit and deny those with a positive credit risk. Due to artificial intelligence, managers can now make better judgements (Eletter et al., 2010).

- As was previously said, classification is a technique that divides an applicant's credit into good and unfavourable groups. This credit score is available to businesses, states, local governments, banking institutions, and other entities. Government officials, bond buyers, and debtors all make advantage of the value produced by processing scores for credit. The risk associated is inversely proportional to the credit score value and depends on multiple factors such as the applicant's financial status, the quantity of money concerned, the collateral they offer, their capacity, and their past conduct (Ghodselahi & Amirmadhi, 2011). The maximum amount of credit given to that certain company is decided based on the relationship between the bank and the company, and among the important factors that influence this are the owner, the business, and, if it's a major company, the activity of the bank. Because the owner's work experience will raise the likelihood of credit, the owner's operations have a greater effect on the credit limit for small companies than other factors (Fernando et al., 2011).
- Logistic regression and linear discriminant analysis are the two models that are mainly used. Assuming a linear relationship between the two variables is a drawback, however it's not necessary for the multivariate normality assumption or the latter. Nevertheless, the variables are not linear in practice. Artificial intelligence techniques demonstrate superior performance comparing to conventional statistical methods over a range of industries, such as support vector machines, artificial neural networks, decision trees, and genetic algorithms.
- Three models are utilized for classification: the support vector machine, neural network, and decision tree, in addition to the fuzzy C-Means clustering technique. Yet mixed methods have been outperforming those previously described specific methodologies in terms of prediction accuracy (Ghodselahi & Amirmadhi, 2011). By assessing risk while making informed decisions when applying for advances, one can minimise situations such as bankruptcy and committing fraud (Moro et al., 2015).

Fraudulent Activities Employing Credit Cards

Credit card fraud occurs for a number of reasons, including applying the not appropriate deployment technique to handle thousands of transactions and categorising cost prices inaccurately for transactions involving different amounts. In addition, the model's input data are uneven, and the method for tagging unlabelled data is cumbersome and unreasonable. The 20% of the original dataset which was unbalanced is removed utilising stratified random sampling. The K reverse close community is then used to remove the outliers, which are considered noise labels.

To classify the information set, first a dimensionality-minimization method will be used, followed by a support vector machine (SVM), more precisely a one-class support vector machine (OCSVM), will be used. This OCSVM differs from SVM in that it uses a single class for training the dataset. The effectiveness of the hybrid under-sampling strategy, when compared to the stochastic neural network (PNN) and the group method of data handling (GMDH), is significantly better with regard to of the detection rate of fraudulent claims (Sundarkumar & Ravi, 2015).

Cloud Defence

The disturbingly frequent failures of cloud computing-related ventures is primarily due to security issues. The five stages of cloud computing modelling are the deployment of cloud models, public risk management models, portability and banking applications, and cloud service models. The eight risk management domains of effective cloud computing are risk preparation, assessment, identification, prioritisation, evaluation, treatment, control, communication, and documentation. Levenberg-Marquardt based back propagation is used to evaluate the chance of occurrence and build a network analysis using the data collected using the Cloud Delphi approach. Following the construction of the network, the data is trained and tested. In the end, the predictive cloud security model is implemented via an artificial neural network (ANN).

Hacking Websites

Users are tricked by phishing websites into revealing their usernames and passwords, which can be utilised for an array of illegal purposes. The data mining algorithm is one machine learning technique for detecting those phishing websites. Associative algorithms and classification can also be used to predict these webpages. The various estimations definitely show that the price per victim is increasing over time. The majority of unsolicited emails are sent to an enormous amount of recipients with the goal of tricking customers of banks into stepping into a trap. The data mining technique will help extract useful information for the user from the vast amount of available data. The 27 main feature vectors consist of a variety of indications, such as URL and domain identity, security and encryption, Java script and source code, page style and content, web address bar, and the human social component. To figure out which method performed best, Aburrous M et al. (2010a) tested a number of them, and including PART, PRISM, JRip, C4.5, MCAR, and CBA. In terms of accuracy and speed, MCAR scored the best out of all the approaches. Though the fuzzy data mining algorithm is used to automatically identify phishing websites, notably e-banking websites, finding an essential characteristic to accomplish this aim is not always simple using this technique (Aburrous M et al., 2010b).

Failure of Banking

Many triggers, such as intense rivalry in the market, an increase of non-banking companies, unexpected hazards to loan portfolios, and the financial crisis, can be blamed for banks' incapacity to make a profit. The whole financial system is at risk due to the collapse of significant players. The unwillingness of big banks to maintain security against non-performing loans was one of the causes of bank failure and the system's collapse in 1980 (Boyd & Gertler, 1994). By analysing risk while making educated choices when applying for loans, bad outcomes like fraud and bankruptcy can be avoided (Mora et al., 2015).

Financial soundness indicators (FSI) are used for measuring bank financial vulnerabilities. They are classified into two distinct categories: negative indicators and encouraging signs. It can be restricted by a number of items, such as sufficient capital, high-quality assets, competent management, earning potential, liquidity, and sensitivity. To predict the collapse of banks over a decade ahead of schedule, three models-profit, logarithm, and discriminant analyses-were

introduced. The "Adaptive Neuro-Fuzzy inference system (ANFIS)" is one approach used in finance to predict when events in the banking system may fail (Messai & Gallali, 2015). A country's banking system and its fiscal health are helped by the banks it has.

In addition, the currency crisis was anticipated employing three models: artificial neural networks (ANN), decision trees, and logistic regression. To evaluate the unsatisfactory scenario, one can compute the ratio of gross total loans to non-performing loans. The non-performing loans are the most important indication of the approaching economic collapse. The main measures of a bank's distress that ANN looked at are the loan loss reserve of loans that are failing, the median return on equity, and the loan loss provision to gross loan ratio (Messai & Gallali, 2015). Neural networks outperforms various other approaches for predicting bank collapse (Messai and Gallali, 2015).

Banking Security System

Traditional panic alarm systems are less effective at securing the banking system against bank and ATM robberies as artificial intelligence is. The function of this system involves three phases: An picture must first be taken and processed before features for artificial vision can be extracted. An artificial neural network (ANN) analyses the event and offers the warning signal status dependent on the learned pattern. The neural network's grouping determines the output class. Ortiz et al. (2016) state that if the output is 1, a GSM cautionary signal and a notification should be delivered.

Mobile Fund Transfer

These days, most individuals utilise mobile banking; sixty-five per cent of member groups with 100 members use it, and most people use payments via their phones. The majority of clients are happy with online payment choices because they divert them from traditional card transactions and enhance banking services by optimising revenue generation. This user experience revolution makes it conceivable to give every customer better service by gathering and reviewing user-generated data and applying the patterns or insights identified in the data (Dubey, 2019).

In addition to being chosen by financial institutions for preserving goodwill with their consumer base, mobile devices provide mobile banking services that users select for ease and comfort. However, according to a recent KMPG survey, 91% of respondents said they had never used their phones for banking. The study's findings categorically show that clients should be categorised based on their preferences.

By focusing on the individual groups of consumers, you can acquire further insights into their needs and motivations behind using mobile banking services. By using smartphones and tablets, banks may obtain more from the service as well as to the useful capabilities that are offered. Awasthi and Sangle (2013) argue that banks may perform customer relationship management employing this technology, with the goal of supporting their customers' objectives. Recently, mobile banking with artificial intelligence has become more popular; banks may utilise this to draw in more consumers (Payne et al., 2018).

Customer Relationship

Retaining present clients and increasing client loyalty depend on bankers and consumers sustaining their relationship. Banking companies are going to have happy customers if they respond to the changing requirements and requirements of their clients. Customer loyalty may increase if better quality services are offered at competitive pricing to entice clients. In the banking sector, a neural network made up of computers that has previously been employed by other companies for the identical reason can be used to predict customer loyalty.

In order to prepare the data for further modelling, factor analysis should be conducted after data collection to determine the important factors amongst all the variables that are available. Both feed-forward return propagation and artificial neural networks are a part of the algorithm in this prediction model. In K-fold cross-validation, K subsets are gathered from the classification of the data throughout the dataset preparation phase. The effectiveness of the algorithm may be measured by utilising the coefficient of efficiency and root mean square error once the dataset has been evaluated. The artificial neural network's prediction of client loyalty shows that high reliability can be obtained (Kishada et al., 2016).

Assessment of Liquidity Risk

Credit, functioning, and market risks are only a few of the financial and technological dangers that face banking companies. Banks need to increase their profitability in order to take in greater capital from stakeholders and keep a steady position of liquidity. Appropriate balance should be maintained between the short-term risk of liquidity and the long-term threat of profitability. Those who are only investing in the bank regularly withdraw their money, leading the bank to spend more on liquidity. However, there are also adverse situations at either end of the flexibility range: inadequate funding indicates a distorted view of the banks, which results in to a drop in deposits and a loss of market share, whilst excessive liquidity signifies a fewer use of the resources that are available. Either way, the bank will eventually end up in an untenable scenario, such as bankruptcy.

In order to establish a notification system for illiquid risk, banks have possession of enormous databases that can be used to develop an artificial neural network, a general algorithm for evaluating liquid risk, and a Bayesian network that is used for forecasting distribution liquidity risk. The different elements of a company's liquidity risk can be categorised into two groups: characteristics related to banks, which consider a range of considerations including credit risk and others, and features related to the market, which believe factors like a downturn, inference in the financial system, and market disorder (capital).

A system risk adjustment model for liquidity is an example of probability calculation for liquidity risk combining data from the market, balance sheet, and pricing method. The probability distribution may be utilised as well to assess liquidity risk, however large data sets must exist for trustworthy results (Tavana et al., 2018). Tavana et al. (2018) deployed an artificial neural network alongside with the Levenberg-Marquardt and genetic algorithms for identifying essential feature vectors. As previously mentioned, the Bayesian network is preferred for

estimating the probability that liquidity risk may manifest from the a trait. After the model has been properly programmed, this combination yields a more reliable and excellent result.

Artificial Intelligence and Virtual Reality

Many companies are using the most the most recent innovations to enhance their operations, which is quite helpful for business management. Augmented reality, which helps people by expanding their senses and improving communication, offers more details and virtual support to lessen the complex everyday issues. Augmented reality has already been used throughout several industries, like food gaming, journalism, and healthcare, for enhancing workflow.

Industries with high expenses for operation and high levels of risk can use this application for business development (Heng, 2015). Virtual reality is also used by financial institutions and banks to assess and represent consumer behaviour and offer the best solutions for enhancing consumers' purchasing habits (Dubey, 2019). But sophisticated processes are implemented as well to minimise physical labour and increase manufacturing. For example, JP Morgan lowered worker activity by 0.36 million hours through the implementation of a contract intelligence system (Dubey, 2019).

Conversational AI

To tackle any issues or queries they may have concerning the goods or services provided by banking institutions, customers must contact the officials. However, the procedure is somewhat tedious and tedious. The development of AI-based financial technology, which works well in businesses, has benefited several industries. Moreover, IBM developed Watson with the intention of addressing questions. In order to do this, it utilizes the use of machine learning and natural language processing (NLP), which enable information retrieval and the representation of pre-existing domain knowledge. These bots are already being used by the vast majority of big, growing banks to better service their clientele (Singh et al., 2018).

Conclusion

Thousands of customers regularly complete several purchases each day. The clients create the data that is maintained as an extensive database. Furthermore, most banking company operations need an enormous amount of manual labour to be accomplished. Thanks to AI, they can now simply decrease the quantity of manual labour carried out by both customers and employees. Machine learning has established this kind of previously difficult task incredibly simple.

The banking sector has been enhancing the standard of its offerings by providing a number of practical instruments which offer convenience and security. Technology keeps evolving every day, thus it makes sense to apply these advancements to the different commercial fields. The financial system's security requires being maintained and enhanced, and other industries that deal with banking are prepared to embrace the latest developments in technology. In this digital age, customers growing expect their bank to be up to date. The technology's upgradeability will improve service and security while additionally improving the bank's reputation. These days, customers are driven to mobile and internet banking due to its efficiency and user-friendliness.

Several studies show that different approaches are used to maximize procedure accuracy, which improves the customer-banking interaction and delivers a win-win result. Due to rivalries with non-banking fields, banks need to stay up to date with current technological advances in the digital era in order to improve the quality of their services. Technology is more advantageous to the financial services sector. AI technology should be used by the financial services sector to give smooth and spontaneous consumer banking exchanges. Fortunately, an abundance of applications of artificial intelligence (AI) have been rendered available to assist banks in functioning as efficiently as feasible, creating novel possibilities for the banking sector.

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