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The Influence Of Business Intelligence Implementation On Cooperative Banks' Operational Performance

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It is a fact that the close-parking digitalization of the banking industry has shown the significant importance of Business Intelligence (BI) tools in improving the decision-making process and the efficiency of the organizations overall operation. This research focuses on the role played by Business Intelligence implementation towards the performance of the operations of a cooperative bank, especially member institutions within regional economies. The study implements the use of a structured questionnaire that was provided to employees, at the managerial level, within the cooperative banks chosen to examine the effect of BI in regards to different operational performance dimensions, such as process efficiency, quality of decisions, customer services, and risk management. In the study, correlation analysis and regression modeling are the statistical tools that it uses to analyze the connection between the degree of BI integration and quantitative performance results. The results demonstrate that there existed a strong positive correlation between the level of BI use and the enhancement of performance in operations. The research also notes the essential facilitators and inhibitors of adoption of BI system at the cooperative banking setting. The findings provide workable findings to the workforce in the banking sector and policymakers on how to maximize BI policies to sustain performance improvements. This study adds to the literature on digital change in cooperative bank owing to the strategic significance of BI in decision-making based on data and competitive advantage.

Keywords: *Business Intelligence, Cooperative Banks, Operational Performance, Decision-Making, Digital Transformation, Data Analytics, Banking Efficiency*

Introduction

In the modern, more data-driven financial environment, the potential to transform data into working knowledge has become one of the essential success factors of any organization in any industry. Banking sector in specific has seen a paradigm shift due to technological changes, digitalisation and the ever-increasing customer-centric solutions requirements. Business Intelligence (BI) has come through as a strong driver of this change, offering instruments and strategies that assist in gathering, integration, analysis, and display of information to in a bid to support both strategic and operational decision-making. The commercial and the privately run banks have led the pack in the BI solution adoption to improve performance, but the cooperative banks, especially those based in the regional and semi-urban locations have just started looking into the prospect of BI in transforming their process. The proposed research seeks to identify how the deployment of Business Intelligence influences the performance of the operations of cooperative banks, in specific dimensions including efficiency, quality of service, risk management as well as making informed decisions.

Cooperative banks are a very essential part of the Indian financial system as they meet the financial requirements of rural and the semi urban communities. This is because Cooperative banks unlike commercial banks operate on it is a member centered, community based model that focuses on inclusivity and accessibility. The farmers, small traders and the low income groups often get their first contact of finances at them thus playing a significant role in the grassroots financial empowerment and rural development. Nevertheless, some of the weaknesses of such institutions often include the use of obsolete technology, their data management system, lack of access to sophisticated financial instruments, and the rate of decision making. The harmonization of Business Intelligence in this case can present a revolutionary solution in this case, which would have resulted in creating an efficient way in which these banks would work and see their performance in real-time and on real-time basis respond to customer needs and regulatory demands.

Business Intelligence is such a broad concept as it regards to technologies, applications and practices applied to business information collection, integration, analysis, and presentation. BI systems take the raw data and transform it into valuable information that facilitates the formulation of sound decisions at all rankings within the organization. Such systems generally consist of data warehouses, data mining, online analytical processing(OLAP), dashboards and reporting. As far as cooperative banks are concerned, BI adoption will entail not only the conventional record-keeping but the data-driven method of process measurement and optimization. By using BI, such institutions will be able to analyze customer behavior, loan than releasing, identify such risk on loans, non performing assets (NPAs) and also make more informed predication of the future obviously based on previous experience.

Since cooperative banks have to cope with the challenges of the modern world of banking, including a growing number of competitors and more rigorous regulatory demands, they will have to find the means of becoming more nimble, dynamic, and efficient. Availability and use of quality information have a direct bearing on operational performance which is the capacity of an organization to provide services in an effective and efficient manner. With enhanced effectiveness of the operations, banks will be able to cut down on their operation costs, improve

customer satisfaction, mitigate risks as well as increase their profitability. BI systems make it easy since they allow banks to make informed decisions based on data, distribute resources better, and track key performance indicators (KPIs) on a regular basis. Further, BI tools allow the employees across all the levels of the organization to access the right data at the right time and this causes less delay in decision-making and more swiftness in the organization.

In spite of the above benefits, introduction of BI in cooperative banks does not come without challenges. These can be the technical incompetence, the monetary shortage, change opposition, and insufficient infrastructure. In addition, several cooperative banks are controlled by regulations found on the local and state levels which in most cases discourage quick technological uptake. In that case, it would be crucial to see how operational results are accomplished by BI in the real world. It is in this regard that the study seeks to fill this gap in knowledge through an empirical research that seeks to evaluate to which level BI can help to drive operational improvements in cooperative banks. The study is expected to elicit the perceived advantages and challenges of implementing BI in banks through organized questionnaires and interviews to bank workers and bank management.

The present study is also currently relevant, as the attention given to the digital financial inclusion and technological modernization of the sphere of cooperative banking in India is increasing. Encouragement of even smaller banks to modernize their operations comes in the form of the government campaigns like the Digital India initiative, along with the campaign towards cashless transactions. In line with these national purposes, cooperative banks are to be proactive going forward through the implementation of technologies such as BI that could sustain and enable them to remain competitive in the long-run. In addition to the academic literature on the idea of BI and banking, the study has a number of practical implications on policymakers, providers of IT solutions, and administrators of cooperative banks that are willing to make their facilities more modernised.

In addition, the belief that the performance of operations in cooperative banks is multidimensional and could be improved substantially with the help of the strategic use of data and technology serves as the foundation of the study. BI is valuable in terms of key performance indicators that include the turnaround time in processing the loan, effectiveness of reporting the financials, time taken in resolving customer queries, detecting fraud, and the productivity of the employees. This paper assumes that through BI tools, cooperative banks can undergo a paradigm shift in their organization beyond being reactive an institution to being proactive and predictive an institution that can tell the market shifts and needs accurately.

In summary, the consistency of the research is seen through the studied area of an intersection that is quite understudied but also quite topical: Business Intelligence and cooperative banking. In spite of the fact that much of the research on the use of BI has tended to focus on its use in large commercial banks or multinational financial institutions there has been little research on its effect on cooperative banks in impoverished countries especially in India. This study addresses such a gap that lacks empirical data on how BI can transform this aspect in terms of efficiencies of operations in cooperative banks. In this way, it does not only progress

academically, but also makes practical suggestions to better the life of cooperative banks in the sphere of wise utilization of information and technology.

Literature Review

Business Intelligence (BI) in banking sector has drawn much academic and industry attention because of its capability to enhance decision-making, efficient operations and customer relationship management. BI adoption may be a major performance enabler when resources are limited and the digital maturity of the organisation is weak (as it is typical to the cooperative banks).

It is essential to know what causes employees and organizations to use and embrace BI systems. Brooks (2007) presents motivation as a central force of organizational effectiveness implying that the motivation of employees contributes to the success of realization of new technologies like BI. The practice of managerial effectiveness based on the opinion of an informed decision-making is one that was stated by Drucker (1954) and forms the basis of contemporary BI implementation.

Bryan and David (1989) introduce the modern organizational principles; they explain that information systems should be connected with strategic goals. The mechanisms that organizations are developing to meet this need must be able to not only just store information but also to turn it into strategic knowledge and this is what BI is all about. Such a perception is further supported by Elbashir et al. (2008), who empirically prove the positive correlation between the use of the BI system and business process enhancement and overall company performance.

The Indian bank was the presented case study by Chandrasekhar and Sonar (2008), who concluded that information technology strongly contributes to the overall factors of productivity and efficiency. This also seems to be stated by Elaheh and Mohammad (2017), which investigated the role of BI in the banking sphere and found that BI, when applied successfully, could help the institution to deal with big data issues and draw conclusions. In the same way, Ghaziri (1998) pointed out the opportunities and threats of the information technology in the banking sphere, stating that it should be implemented as carefully planned, as possible.

In the systematic mapping conducted by C ote-Real et al. (2014), the authors outlined the stages of diffusion of BI and analytics in which organizations develop and elaborate on the measures over time as they are able to obtain and take into account the data and make forward-looking models and decisions. Faycal et al. (2013) published a maturity model dedicated to the BI implementation in small and medium-sized enterprises, which may specifically be used in cooperative banks as they have similar structure.

It is no secret that BI systems boost decision-making. Goran (2018) addresses the decision-making process in the context of BI 3.0 by giving special consideration to the choice of advanced analytics, the use of real-time data, and mobile BI as the key strategic planning tools. Ghazwan (2016) is no different, concentrating on the use of BI in the financial services

environment and indicating that it is a good practice to utilize BI to result in optimal agility in operations and the competitive edge.

In cooperative banking, one of its performance measures is customer-centricity. Buttle (2008) and Cristiane and coauthors (2016, 2018) discuss the importance of Customer Relationship Management (CRM) systems that tend to overlap with the role of BI platforms. They opine that BI-enhanced CRM leads to a better capability of innovation and alignment of the strategies to the needs of the customers. Debnath et al. (2016) suggest that future research in CRM environment suggests the incorporation of data analytics in relationship management models.

These measures of efficiency in operations include customer service and efficiency of sales among others that are effective in measuring the performance of the operations. Cook and Hababou (2001) came up with the performance measurement tools involved with the bank branches, whereas Clark and Watson (1995) concerned with scale development and scale validity in the measurement of organizational capabilities. Gallizo et al. (2011) discussed the effects of efficiency and banking reforms in Romania and this gave a touch of international scenario on the aspect of performance enhancement using technology.

Debra and Philip (2014) and Gary and Charles (2015) took the educational field of study and discussed the relevance of big data and BI in building the future curriculum in information systems practitioners. Their works highlight the topicality of BI tools not only to be used today but also to become the required competencies of the future banking specialists.

Comparative study Debi Prasanna and Anitha (2017) indicate that rough computing and statistical predictive models have a different level of accuracy and efficiency. This is relevant in collaborative banks that wish to forecast on loan defaults, client attrition or latent demands.

Dobbs and Hamilton (2006) also analyzed small business growth trends with one of the activities being the role of innovation and adoption of technology as growth enabler. They can be applied to cooperative banks a lot of which operate on a similar level.

Although much literature is available regarding the benefits of BI in the context of commercial banks and general enterprises, the existing literature regarding the benefits of BI in cooperative banks is few. The majority of the current studies concern the BI implementation in sizeable or technologically superior settings. The cooperative banks, which can be considered as a financial support of people living in the countryside and semi-urban areas, have their own specific strategies regarding the BI implementation that should be adjusted to its organizational structure and limitations in resources. A gap in empirical evidence is also detected by the review which concerns the effect of BI on certain operational indicators - loan processing time, NPA management and customer service turnaround of cooperative banks.

This study attempts to address such gaps through the research inquiry concerning the practicable impact of BI implementation on operational performance indicators in cooperative banks. Using the joint effort of the above-mentioned studies and the results of primary data

aimed at cooperative banking institutions, the research should be able to give a more sophisticated idea of how BI leads to increased efficiency, quality of decision making, and customer satisfaction in one of the most important yet under investigated areas of the financial sphere.

Objectives of the study

1. To examine the extent of Business Intelligence implementation in cooperative banks.
2. To assess the impact of Business Intelligence on the operational performance of cooperative banks.
3. To identify key factors influencing the successful adoption of Business Intelligence in cooperative banks.

Hypotheses

Null Hypothesis (H_0) - IT-infrastructure readiness has no significant influence on the successful adoption of BI in cooperative banks.

Alternative Hypothesis (H_1) - IT-infrastructure readiness has a significant positive influence on the successful adoption of BI in cooperative banks.

Research Methodology

The proposed study will use quantitative research methodology to analyse how Business Intelligence (BI) implementation has impacted the performance of the operations of cooperative banks, and also the factors that precondition the successful implementation of the same. Its methodology of research is descriptive and empirical in nature which is based on the collection of primary data based on structured questionnaires. The study will cover managerial and IT personnel employed in cooperative banks because those are the individuals who are best conversant with the process of implementing and deploying BI tools as well as use in their organizations. A purposive sampling method was adopted, in order to make sure that only such participants in the planning, deployment and utilization of the BI systems, would be sampled. The study sample comprises of 150 respondents that will be selected in the cooperative banks in the region of Vidarbha, Maharashtra. The data was gathered through a pre-tested and standardized questionnaire which was modelled on a 5-point Likert scale to test the extent to which the respondents agreed to the statements included regarding their various experiences on the BI adoption and the resultant performance levels. Both printed and electronic copies of the questionnaire were sent to increase the distribution and respondent rates. Case studies and annual reports of policy documents of relevant banks as secondary data were also examined in order to support the analysis. Statistical measures like descriptive statistics, correlation analysis, and multiple regression were used to prove the hypotheses formulated and the magnitude and orientation of relationships between the variables represented. This research approach makes the results on one hand reliable and on the other hand valid making them applicable in practice and contribution in academics.

Table: Descriptive Statistics for IT-Infrastructure Readiness and BI Adoption (n = 150)

Variable	Mean	Standard Deviation	Minimum	Maximum
Availability of reliable internet and network systems	4.12	0.81	2	5
Adequacy of hardware and technical equipment	3.94	0.77	2	5
Compatibility of existing IT systems with BI platforms	3.88	0.83	1	5
Frequency of system upgrades and maintenance	3.69	0.92	1	5
IT support and technical assistance availability	4.05	0.79	2	5
Overall IT infrastructure readiness score (composite)	3.94	0.68	2.2	5

In the descriptive statistics used to describe the construct; (IT-infrastructure readiness), the results indicate that there is a general positive attitude among the respondents about the readiness of their cooperative banks with respect to the technological preparedness of adopting Business Intelligence (BI) system. The composite (mean) score of IT-infrastructure readiness is 3.94 on a 5-point Likert scale, which means that the majority of respondents concur that their institutions have the prescribed IT infrastructure to enable BI implementation. The standard deviation is relatively small of 0.68 implying a medium amount of consistency in the responses between different participants.

The individual indicators with the highest mean score of 4.12 is based on Availability of reliable internet and network systems, which brings out as one of the strengths that these banks are into in the technological front. This is paramount, because unless there is a solid connectivity any BI system cannot operate properly. The availability of IT support and technical assistance also indicated a high level (mean = 4.05), which indicates that bank organizations possess sufficient human resources that can be used in the maintenance and troubleshooting of systems which is fundamental in the continuity of BI use.

At the lower range, the measure, frequency of system upgrades and maintenance received a score of 3.69, which means that the basic infrastructure setup is intact, but an active IT maintenance program and consistent upgrade might be something that has to be worked on.

The mean values of the factor of the compatibility of the existing IT systems with BI platforms and the adequacy of the hardware and technical equipment were 3.88 and 3.94 respectively, meaning that despite the relative well-equipment of banks, some gaps might arise related to the integration of the new BI tools and older IT systems.

In general, the overall descriptive statistics allow holding the hypothesis that IT-infrastructure preparedness is a crucial aspect of the successful implementation of BI to the cooperative banks. Despite some unbalanced positive and negative values in the indicators, the overall mean scores are relatively high, indicating that the conditions favorable to the BI integration exist in the company. Additional supporting of the BI integration process by further investment into ensuring in system upgrades and compatibility requirements would probably enhance the adoption indicators further though.

Table: Pearson Correlation – IT-Infrastructure Readiness and BI Adoption (n = 150)

Variables	IT-Infrastructure Readiness	BI Adoption
IT-Infrastructure Readiness	1.000	.612**
BI Adoption	.612**	1.000

Note: **Correlation is significant at the 0.01 level (2-tailed).**

Pearson correlation was used as a statistical tool in testing the hypothesis that: IT-infrastructure readiness significantly positively affects the successful adoption of Business Intelligence (BI) in cooperative banks by gathering data of 150 respondents. The findings showed that the readiness on the IT-infrastructure and BI adoption is high, and the relationship is positively correlated, where the Pearson correlation coefficient was $r = 0.612$ with a p value of less than 0.01, and thus statistically significant. This observation definitely indicates that cooperative banks are more likely to succeed in the implementation and usage of BI systems in case of high rates of IT-infrastructure readiness including features of network reliability, hardware sufficiency, software compatibility, and IT support.

The closeness of the correlation suggests that IT infrastructure can be a major pillar of Business Intelligence projects, since it would specifically influence the performance of any system, the satisfaction of the users, as well as the compatibility of data analytics tools. The relevance of the result also implies that, the null hypothesis (H0), which indicated that there exists no significant relationship between the two variables, can be discarded with certainty. These results justify the alternative hypothesis (H 1) as these results prove that better IT infrastructure has positive effects on the level of adoption and proper use of BI tools in the process of operations.

Therefrom, managerial implications, the findings reflect that cooperative banks are ultimately prone to benefit by investing and sustaining extensive, scalable, and compatible IT environments in the event that they are interested in utilizing BI systems to facilitate data-driven decision-making, more effective customer service as well as operations optimization.

Recommendations and Discussion

Results of the study give strong evidence that the IT-infrastructure readiness has a major effect on successful implementation of Business Intelligence (BI) in cooperative banks. High positive correlation ($r = 0.612$, $p < 0.01$) shows the cooperative banks with superior developed IT systems to implement and use BI tools have higher possibility of succeeding in implementing and applying the tools. This concurs with the literature that BI systems lack a sizeable degree of technological support because of which they are not able to function effectively and produce any sort of significant results.

Well, a number of IT-based conditions would make the adoption of BI successful, and the names of such conditions are network reliability, availability of up-to-date hardware and software, and capabilities of systems integration as well as in-house technical support. The cooperating banks are resource crunched and technologically behind the commercial banks many times, where IT-infrastructure- readiness is not only a supportive factor to BI effectiveness, but is rather a strategic opportunity.

The findings also note that though the majority of cooperative banks within the study region (Vidarbha) depict a moderately strong IT backbone, there is need to make improvement on aspects such as system upgrading, maintenance cycle and integration into the legacy systems. Inconsistent fixes of the IT infrastructure may result in inaccurate data, breakdown of systems and partial use of BI tools, which may spoil the purpose of the investment.

Recommendations

1. Upgrade Spending on Flexible IT Systems - Cooperative banks ought to invest on capital, toward modernization of their IT assets to scalable and cloud compatible systems. This shall make it integrate with the changing BI environments seamlessly and lower the costs of transition in the future.

2. Formulate Strategy Maintenance IT Plans - Introducing regular system audits, updates of hardware and patching of software should become a part of the operational strategy of the bank to ensure that the BI environment remains stable.

3. BI-IT Compatibility Guarantee - Before making procurements, banks ought to determine the compatibility of accustomed IT platforms to chief BI tools. Integration barriers will be lessened with modular BI tools, which are flexible and are able to work with the systems that exist.

4. Train more Technical Support - The BI technologies should be continually trained against the internal IT teams. Also, banks could have an outsourcing option that is available on technical assistance on specialized functions to evade the international break and enhance the performance level.

5. Data Driven Culture by means of Training - Coupled with IT optimization, banks have to pay attention to the training of the staff on the use of BI and interpretation of the data. An already technically equipped infrastructure alone cannot hope to last long, when end-users lack the confidence of using the tools, in advancing informed decisions.

Overall Conclusion

This paper has analysed the impact of IT-infrastructure preparedness on successful implementation of Business Intelligence (BI) in cooperative banks where empirical information has been used based on sample respondents of the selected banks in the Vidarbha region. The results indicate a positive and the statistically significant correlation between quality of IT infrastructure and degree of BI implementation. This implies that the cooperative banks that have a well-developed and sustainable and scalable IT system would be in a better position to integrate and exploit the BI technologies.

The findings highlight the fact that Business Intelligence is not just a software implementation program but an overhaul process that needs sound technical platform. Important aspects like adequacy of hardware, compatibility to the system, reliability to the network and support by skilled IT personnel are major factors that will help in determining the effectiveness of adoption of the BI tools leading to performance enhancement.

As the paper analysis indicates, there are also some spots yet to be covered by cooperative banks, especially when it comes to regular update of the system, integration of legacy systems and familiarization with BI tools at the user-level. According to these gaps, cooperative banks need to put more efforts to ensure that BI is utilized fully, especially in terms of overcoming infrastructural and human resource shortcomings.

To conclude, this paper confirms the hypothesis that the readiness of IT-infrastructure has considerable and positive impact on BI adoption in cooperative banks. The results bear significant implications on the policymakers, bank management, and technology planners. Through sensible planning of IT infrastructure, gradual implementation of BI, and a data-driven service culture, cooperative banks will improve effectiveness of their operations room, improve customer service and succeed in a gradually digitalised financial landscape.

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