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A Review Report on the Evolution and Implementation of Business Intelligence Technique in the Banking Sector

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Abstract

Business intelligence systems combine operational data with analytical tools to present complex and competitive information to planners and decision makers. The objective is to improve the timeliness and quality of inputs to the decision process. Business Intelligence is used to understand the capabilities available in the firm; the state of the art, trends, and future directions in the markets, the technologies, and the regulatory environment in which the firm competes; and the actions of competitors and the implications of these actions. In this paper we have discussed about the needful emergence of the business intelligence in the banking industry. We began our discussion with a brief introduction of business intelligence. Then we discussed about the banking industry and the reason why the evolution of the business intelligence becomes essential. Then we presented a stepwise evolution of business intelligence and where it stands today. We followed with the applications of BI in various aspects in banks and subsequently ended our discussion with the future enhancement of where the business intelligence may be proven to be useful.

Keywords: Business intelligence, Consolidation, Regulation, Diversification, MicroStrategy.

1. Introduction

Business intelligence (BI) is a set of theories, methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information which can be used for business purpose or for trade. BI can handle large amounts of information to help identify and develop new opportunities for implementing effective strategies that can provide a competitive market advantage and long-term stability.BI technologies provide predictive views of business operations by analyzing historical and current data. Most common functions, that business intelligence technologies does are reporting, online analytical processing, analytics, data mining, process mining, complex event processing, business performance management, benchmarking, text mining, predictive analytics and prescriptive analytics.

2. About Banking Industry: Consolidation, Regulation and Diversification

Banking enterprises need to keep up with their constantly changing industry to stay viable and competitive. Over the past several years, a host of mergers and acquisitions in the banking industry has resulted in a shift in corporate goals and an increased focus on managing internal systems. All this consolidation activity gives banks the opportunity to greatly reduce overhead costs by integrating operational processes. To make the most of this opportunity, banks must identify areas where they can increase efficiency, cut costs, and reduce redundancies. In addition, consolidation of assets allows banks to manage these assets in such a way as to maximize their profits [2].

Regulatory changes are required for banks to examine many of their operational processes. To most efficiently comply with these regulations, banks must integrate the finance and risk segments of their businesses. By assessing business performance on a risk-adjusted basis, banks can strengthen their performance goals while

meeting the new compliance requirements. Banks need information analysis and reporting capabilities to comply with these regulations, manage risk, and grow shareholder value.

The intense competition and changing regulatory requirements are also forcing banks to put a greater focus on profitability in order to survive. Banks are looking for ways to differentiate themselves from the competition, and many are focusing on increasing customer revenue to maximize performance. Banks are trying to stand out from the competition by providing top-quality customer service as a way to retain customers and gain new ones. However, expanding their customer bases has resulted in increase diversity in customer preferences and behaviours. In competition of providing more customer service across multiple channels, Internet banking and call centres have been introduced [4,6].

As, banks are handling more and varied kind of customer, banks are facing difficulty in understanding and tracking the consumer need's, customer's trends, to identify profitable areas and to monitor consumer credit. Increased customer diversity also leads to challenges for bank to fulfil growing consumer demands and to satisfy its customers. Thus Banks have understood that they must provide low-cost, personalized, and timely service across multiple channels, or their customers will simply find it elsewhere. The banking industry is also facing growing competition from new outlets, such as online payment services, which are consuming market segments without having to deal with many of the costs and regulations that banks must face [5].

3. Industry Factors Driving Business Intelligence Solutions at Banks

Each of the challenges stated above require banks to be proactive in managing and utilizing corporate data if they want to keep up with or stay ahead of the competition. That's where business intelligence comes in. Business intelligence software gives banking enterprises the capability to analyze the vast amounts of information they already have to make the best business decisions. The software allows banks to tap into their huge databases and deliver easy-to-comprehend insight to improve business performance and maintain regulatory compliance.

The applications of business intelligence in the banking industry are far-reaching. The first step begins with managing large volumes of data from many sources, including a diverse customer base, extensive branch networks, and shareholders. Micro Strategy's unified information architecture allows companies to easily integrate and cross-reference vast amounts of information from multiple sources, identify relationships among the information, and learn how different factors affect each other and the company's bottom line [1,3].

In addition, a bank will have many people in different locations with varied skill levels who need to use this information for varying purposes—everyone from executives who need high-level customized summary data with drill-down capabilities to power users who need to create and design custom reports to data analysts who must identify and communicate market trends. Micro Strategy offers a single, easy-to-use Web interface that allows multiple users to access the information relevant to them. Micro Strategy's unique and intuitive analytical capabilities allow different users to manipulate the data to glean the most from the information that affects their decision making [9].

Micro Strategy's unified Web interface also offers extranet capabilities, allowing remote branch operations to access a secure Website where they can utilize micro Strategy's extensive analytical and reporting capabilities. The Micro Strategy architecture provides unique capabilities for banking enterprises to reach branch operation users immediately and securely.

And lastly, every bank targets to increase revenue while maintaining or reducing costs. Business intelligence techniques allows banking enterprises to analyze profit and loss, including product sales analysis, campaign management, market segment analysis, and risk analysis. It's a well known fact that banks can grow revenue by maximizing customer value over the long term and improving customer acquisition and retention. At the same time, costs can be reducing by managing risk and preventing fraud, as well as improving operational efficiency [8,10].

MicroStrategy's unique business intelligence architecture allow us simultaneously to accesses immense amounts of information, enabling analysis from many sources at once and providing the most thorough and integrated reporting. Micro Strategy then presents this information in user-friendly reports, scorecards, and dashboards and allows users to look at the information in different ways, thus offering simplest and useful ways to analyze the information and to get the desired results. This result helps in developing business strategies that in turns increases profit.

4. Evolution of BI in banks

4.1 Manual systems : Manual systems were prevalent before the use of computers, when banking operations were small and limited only to branches. These systems involve the manual recording of branch transactions and the generation of rudimentary reports from manual ledgers, which are consolidated with those of other branches into a final report for the bank as a whole. Here BI was limited to simple bank transactions only.

4.2 Implementation of computer based systems: With time, banks grew in size. This growth was in channels and geographical footprints. This growth has lead to increase in transactions in multifold. Manual reporting, which was time consuming, error prone and filled with redundancy, proved unequal to the task and made way for automated systems. And banks began to increasingly depend on technology to manage their huge volumes of data [7].
With the introduction of computer in banks, branch-wise computerized reports- mostly MS excel spreadsheets- were consolidated at a bank level. However, they were not very comprehensive and being limited to banking transactions, did not support decision making.

4.3 MIS based systems: The search for higher decision support capability led to the introduction of MIS based systems, which are specialized techniques and tools used in a BI framework. These systems crunch the simple banking data into comprehensive insights that can guide key business decisions. Today, the scope of BI extends mere reporting of banking transactions to other areas impacting the banking business as a whole.
By using BI techniques like data mining banks can get a 360-degree view of data and drill it down extensively to take informed decisions.

5. Applying Business Intelligence to the Needs of the Banking Industry

In present times, banking enterprises are using business intelligence knowledge in many ways. This knowledge has helped in creating smart business solutions across the myriad challenges in the Banking industry.

5.1 Financial and operational performance management

In order to increase profitability, banks are planning and looking at corporate performance goals. They are then determining about their internal and external processes align with corporate strategy to track their progress toward reaching their goals. MicroStrategy's architecture allows banks to integrate and cross-reference huge amounts of information from multiple sources to determine how the different variables affect each other and the bank's overall financial health. MicroStrategy's business intelligence techniques help banks to set financial performance goals and to monitor their financial portfolios [5].

5.2 Customer profitability management

With high customer turnover rates, banks are working hard for identifying their most profitable customers for targeted retention efforts. MicroStrategy's in-depth analytical capabilities allow banks to analyze customer profitability by individual, household, account type, branch bank, or other factors. Thus, with the concept of

BI, banks can predict customer attrition rates and develop effective marketing campaigns based on analysis of customers' behaviours and preferences. In addition, by identifying customers' service needs, banks can offer and direct customers to the channels and products that best meet those needs, as well as acquire new customers with targeted marketing efforts [7].

5.3 Other application areas in the Banking Industry where Business Intelligence enables enhanced competitive standing

5.3.1 Profitability management
MicroStrategy's unified architecture allows actuarial and risk analysis across multiple sources, offering simplified reports and drill-down capabilities for the most in-depth and accurate risk analysis, as well as the analysis of any relationships that indicate risk trends.

5.3.2 Credit analysis
Business intelligence provides easy tracking of operational costs, allowing companies to create smart business strategies and set achievable internal goals. Plus, MicroStrategy's unique centralized administration and security optimizes IT resources and operational efficiency. These capabilities reduce costs and allow companies to easily monitor expenses [2].

5.3.3 Regulatory compliance
Business intelligence allows Banks to identify activities related to fraud and predict potential fraud before it occurs. MicroStrategy's in-depth analytical capabilities help Banking companies recognize fraud before paying fraudulent charges, reducing losses due to fraud and improving recovery rates.

5.3.4 Operations management
Banks can grow their profit margins by increasing the efficiency of their internal operations. MicroStrategy's unique business intelligence architecture allows banks to analyze employee and branch information across multiple sources to increase productivity and set performance goals. In addition, consolidation allows banks to identify areas where they can streamline processes and cut costs. Banks can also enhance performance and shareholder value with timely reporting and monitoring systems that help them develop the most optimal and realistic budgets and strategic plans. MicroStrategy's performance scorecards also allow banks to communicate corporate and individual performance goals across the many levels of the enterprise with automatic personalization [9].

Along with the different areas of implementation of Business Intelligence in the Banking Sector this technique has also been applied widely in the field of Social Network. A new term known as Social Business Intelligence has been coined in this aspect. We shall view about some of its aspects in the next section.

5.3.5 Social Business Intelligence
Social Business Intelligence refers to the creation, publishing and sharing of custom business analytics reports and dashboards by end users of Cloud technologies.

Social or collaborative BI is the use of Enterprise 2.0 tools and practices with business intelligence outputs for the purpose of making collective decisions. First enabled by the rapid growth of social media networks in 2009, Social BI allows for the collaborative development of post user-generated analytics among business analysts and data mining professionals. This has removed previous barriers to self-service BI while still employing traditional analytics applications [11].

Social BI can also be interpreted as providing business intelligence based on social networks data. For example, a company selling consumer electronics goods needs to know how people are responding to their latest advertisements or promotions. The reports and visualizations made using social media represent what

people are talking about in real time. Pulling data from different social media and preparing understandable reports will help company to decide upon further steps. These dashboards, visualizations, reports based on social media will be of help for companies to get efficient feedback and act accordingly [11,12].

5.3.6 Uses of Data Mining in Business Intelligence

Currently, huge electronic data repositories are being maintained by banks and other financial institutions. Valuable bits of information are embedded in these data repositories. The huge size of these data sources make it impossible for a human analyst to come up with interesting information (or patterns) that will help in the decision making process. A number of commercial enterprises have been quick to recognize the value of this concept, as a consequence of which the software market itself for data mining is expected to be in excess of 10 billion USD. This note is intended for bankers, who would like to get aware of the possible applications of data mining to enhance the performance of some of their core business processes. In this note, the author discusses broad areas of application, like risk management, portfolio management, trading, customer profiling and customer care, where data mining techniques can be used in banks and other financial institutions to enhance their business performance [15].

6. The future of Business Intelligence: Operational BI

Traditional BI deals with the analysis of historical data. It typically has a long decision making cycle. On the other hand, the newly developed science on operational BI, works on the recent transaction data to enable fast, even "near real-time" business decisions. For this reason operational BI is more complex to manage than traditional BI.

Operational BI has many uses. For example, it can draw the attention of bank employees to likely needs of customers whom they are serving at that moment, or to alert them to a hot listed/fraudulent instrument present at the counter.

***6.1 Key challenges**:*

Although the implementation of BI has several benefits, it also has several key challenges:

- **Poor quality data**: Banks keep their data in varied databases, creating problems for data redundancy, inconsistency and inaccuracy. Also this data is usually not available in a format that is ready for use by a BI system. Hence it must be extracted from the data sources and cleansed before it can be fed into the BI system, which could take quite long if the data is voluminous. However, inconsistent and unambiguous data can be handle by tools like rough set and its approximation properties, but again this tool's efficiency decreases with the increase in size of data [11,13]
- **Lack of trained staff**: Simply installing a BI tool is not enough; staff should be trained to handle properly as even one mistake may cause a "make or break" situation for the bank [14].
- **High investment**: BI is relatively a new concept and not many banks are interested in implementing it on a large scale, given the high initial investment. Banks need to recognize that the long-term business benefits of BI outweigh its costs.

Although banks stand to gain substantially from BI implementation, they must not think of it as a silver bullet. BI systems and tools process data very well, and contribute to decisions to some extent; that being said, BI is a decision support system. The bonus of taking final decision on the basis of analyzed data rests solely on the decision makers within the bank.

7. Conclusion

We have discussed about the need of the evolution of business intelligence in the banking sector and the help which it can provide in various aspects of the banking sector. We continued our discussion with a few largely used applications of BI in the industry of banking. Finally we concluded our discussion with the future scope which the BI can provide to the industry.

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A Brief Author Biography

Rajorsi Panja is currently persuing his MBA from CMS, Burdwan University, Burdwan, West Bengal. He had completed his BBA from Raj College under The Burdwan University, Burdwan. His research area includes Finance and marketing . He had published several papers at national and international levels. He is currently holding the post of President in his department, and The Life Member of MBA Alumni Association,BU. He has completed a training on the marketing Strategies & Sales promotion of MP Birla Corporation Ltd. as his Major Project in this semester& also completed The minor project From State Bank Of India.

Subrata Paul is currently working as Assistant Professor in Bengal College of Engineering and Technology, Durgapur, est Bengal. He had completed his B.E(CSE) from VTU – Belgaum, Karnataka in 2010 and M.Tech(CS) from Berhampur University in the year 2013. His research area includes Social Network Analysis, HPC and Cloud Computing. He had several publications at national and international levels, both in journals and conferences including a paper in IEEE - conference. He had an experience of nearly 3.5 years in teaching undergraduate courses and 1 year in handling post graduate classes. He usually teaches papers like Software Engineering, Computer Network, Artificial Intelligence and Programming in C Language.

