

OPTIMIZING BUSINESS INTELLIGENCE SOLUTION FOR BANKING IN ALBANIA

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Abstract

Increasingly banking systems decisions tend to be based on data. The information available to these banks is the most critical component for their success. Guided by the increased competitiveness due to changing business models and the growth of the demand for new applications, many banks in Albania are adopting Business Intelligence (BI) technologies, data warehouse (DW) and systems that help the decision making process. BI is the process of transforming raw data into meaningful information to enable more effective business insight and decision-making. BI is implemented to give users access to information in their systems in an automatic and efficient way. The users need not to have any technical knowledge of the underlying system because all data gathering are performed automatically by the BI systems. BI enables an increase to a high number of users and offers a superior capacity for generating reports, which are easy to use and contain well- detailed analysis of the level of granularity of the data.

This paper focuses on the importance, advantages and the strategy of implementing BI solution in banking systems in Albania.

Keywords: *Business Intelligence (BI), Data Warehousing and OLAP cube.*

Introduction

Nowadays, banks industry have over the years collects huge amounts of business and customer data into large electronic repositories. They have large volumes of detailed operational data, but key business analysts and decision makers still cannot get the answers they need to react quickly enough to changing conditions because the data are spread across many departments in the organization or are locked in a sluggish technology environment.

Is the maintenance of this data an obligation, an asset or just another regular task for them? This data will always be reliable as long as it is locked inside the repositories. This information is the most important asset of any organization. To turn data into an asset, its inherent value needs to be stored and analysed. There are two main purposes used for this asset:

1. Data capturing for operational record
2. Data analysing for decision making

The first one, are optimized to process everyday transaction quickly. They register client, take orders, monitor the status of operational activities, and other activities in bank. The employees of an operational system turn the wheels of the organization. Operational systems do not maintain history, they are used to put the data in and to reflect the most current state of the organization.

The second one, is where we get the data out to evaluate the performance of the organization. For this purpose, are used Business Intelligence (BI) systems. They are used to count the new clients and compare them with last week's results, and ask what the new customers want, and the reason why they are complaining about. It can help banks to improve products, enhance customer relationships, make better forecasts based on the past trends, handle competition, manage risk, increase operational efficiency etc. BI outputs give organizations a better understanding of their present circumstances, so that they may take the right course of action in future.

BI is a sets of tools, technologies and solutions designed for end users to efficiently extract useful business information from a lot of data.

Business Intelligence

In the literature, BI is both defined as a process and a product. The process is “composed of methods that organizations use to develop useful information, or intelligence, that can help organizations survive and thrive” (Jourdan, Rainer, and Marshall, 2008). The product is the information that allows organizations to more accurately understand current and predict future behaviors of “competitors, suppliers, customers, technologies, acquisitions, markets, products and services, and the general business environment” (Vedder, Vanecek, Guynes, and Cappel, 1999). Successful organizations improve the value of their customer base by reducing the rate of defections, increasing the longevity of the relationship and enhancing the growth potential of each customer (Kotler and Keller, 2009). BI can be used to mine customer relationships (Phan and Vogel, 2010), identify profitable customers and facilitate retaining them by understanding

individual behaviors (Jaffri & Nadeem, 2004). Organizations can gain a competitive advantage with successful implementations of BI (Jaffri & Nadeem, 2004), by recognizing “their raw transactional data as a valuable source of unique information” (Gunnarsson, Walker, Walatka, & Swann, 2007).

Given that banks receive a vast amount of information from different resources, the main problem in taking the operational decision is to focus on the right information. In today’s rapidly changing business environment, organizational resourcefulness depends on operational monitoring of how the business is performing and mostly on the prediction of the future outcomes which are critical for a sustainable competitive position. Intelligence becomes an asset only if it is used (Flud, 2003).

Implementing a BI system can help to identify the causes and reasons of certain occurrences thus, helping the business to make predictions, calculations and analyses; so that the needed knowledge is successfully extracted from the data and that the proper decisions are made. BI consists of a wide range of analytical softwares that provide the information of taking better decision by every user of the business, such as analyzers, managers and operators. The information is in real-time and supports reporting on every organizational level.

According to Blomme, traditionally, BI systems provide a retrospective view of the business by querying data warehouse which contain historical data. On the contrary, contemporary BI-systems analyze real-time event streams in memory (Blomme, 2013).

BI is implemented to give users access to information in their systems in an automatic and efficient way. The users need not to have any technical knowledge of the underlying system because all data gathering are performed automatically by the BI systems (Ritacco, 2003).

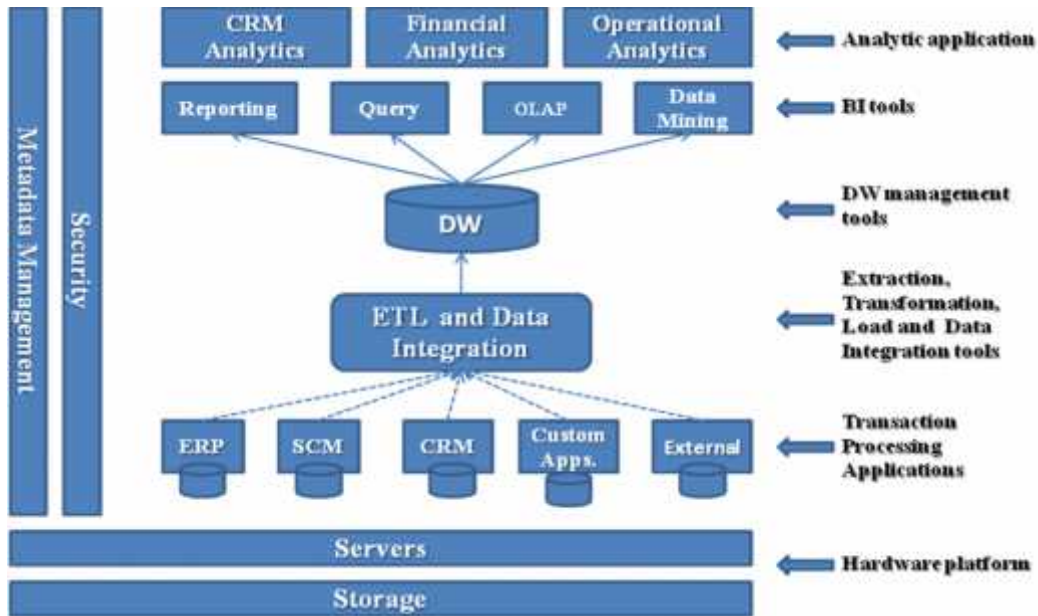
BI technology in banking

The financial services industry is influenced by some factor such as globalization, integration, growing competition, product and market innovations, reengineering of processes, and other trends. Financial institutions must also manage risk and comply with regulatory requirements such as Basel II accord and IAS (Katarina Curko, 2011). To be successful, financial institutions must (Howson, 2008):

- Monitor all aspects of client relations;
- Identify and retain the most profitable customers;
- Attract new customers from competition;
- Correctly measure products’ and organizational productivity;
- Recognize new markets and needs for newproducts.

Efficient Business Intelligence connects business with information technology (IT) so that the available resources can be allocated with respect to their own capabilities, as well as provides intelligent problem solutions (Ranjan, 2008). Figure 1 describes the BI environment, which integrates many of the business processes (ERP, CRM, etc.) into multiple applications that serve the primary source of data. Once the data are gathered and stored in e DW can be easily analysed with the help of BI tools, such as reports, OLAP, and data mining. These analytic

tools have the potential to provide actionable information that can be turned into valuable information on which the companies base their decisions.



Picture Nr.1. *BI environmant*

BI Maturity model

For evaluate the using of BI solution form banking in Albania is used one maturity model CMMI (Capability Maturity model Integration) (SEI, 2010). This maturity model measures and tracks progress in the bank organization for using BI (Fig. 2).



Picture Nr.. *The maturity level*

At *Initial*, maturity level 1, processes are usually ad hoc and chaotic. The organization usually does not provide a stable environment to support processes.

At *Managed*, maturity level 2, work groups establish the foundation for an organization to become an effective service provider by institutionalizing selected Project and Work Management, Support, and Service Establishment and Delivery processes. Work groups define a service strategy, create work plans, and monitor and control the work to ensure the service is delivered as planned.

At *Defined*, maturity level 3, service providers use defined processes for managing work. They embed tenets of project and work management and services best practices, such as service continuity and incident resolution and prevention, into the standard process set.

At *Quantitatively Managed*, maturity level 4, service providers establish quantitative objectives for quality and process performance and use them as criteria in managing processes. Quantitative objectives are based on the needs of the customer, end users, organization, and process implementers.

At *Optimizing*, maturity level 5, an organization continually improves its processes based on a quantitative understanding of its business objectives and performance needs. The organization uses a quantitative approach to understand the variation inherent in the process and the causes of process outcomes.

Since BI is a process, we used CMMI model for testing the improvements of banks in this process. This process has three levels: acquiring the data, analyzing the data, and taking action based on the data. This levels are used as independent variables and BI maturity level is considered as dependent variables.

Analyses questionnaire and result

For gathering the needed data we used a questionnaire. It is valid and reliable. The model which is used for the BI processes modeling is as shown at Tab. 1. Therefore we just need to know what is the maturing level of these processes in Albanian Banking.

Factors	Construct
Acquire the data	Data gathering
	Extraction
	Transformation
	Data storage
	Data warehouse
Analyse the data	Reporting and dashboard
	Online Analytical Processing

	OLTP
	Data Mining
Take action based on the data	Business strategist

Table 1. The phase of BI process

Each main process and sub process is assessed according to CMMI maturity levels. For each question at a structured questionnaire, we used a scale from 0 to 5, as defined by CMMI. Here are the results.

Process of Acuring the data

At this phase Data are extracted from this environment and stored in the data warehouse (Willima A. Giovanazzo).

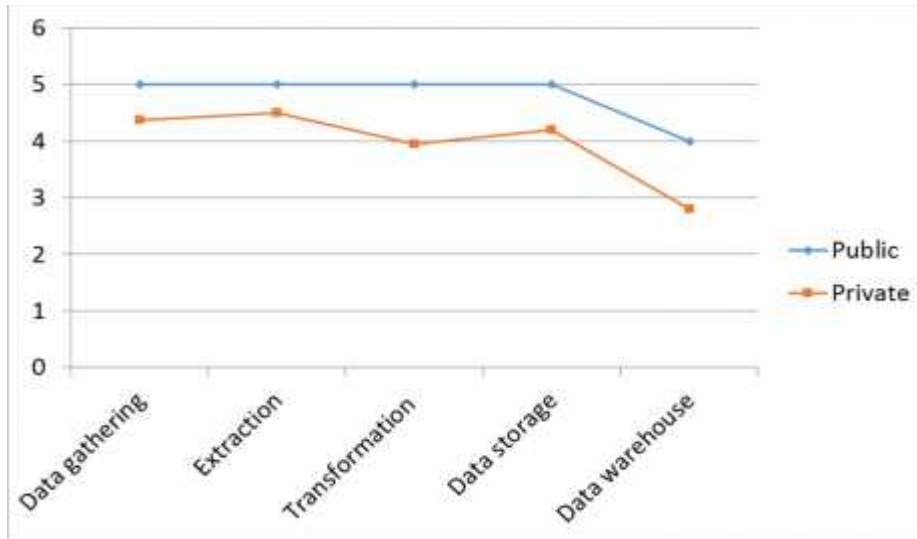


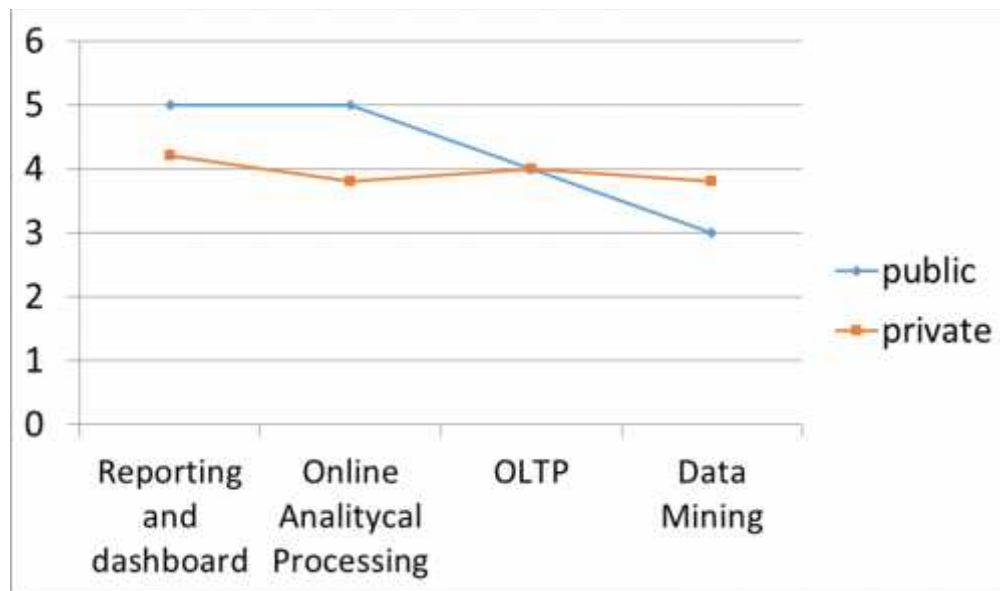
Figure 1. Chart for the process of acquire the data

- *Data gathering* is the process of gathering the data from different sources. The data in Albanian banking are gathered through ATM, POS, client, and proces done automatically and systematically.
- *Data extraction* is the process of received data form the operational environment, like transponalble tables or NoSQL database for moving data into the warehouse. In Albania banking there is not any automatic process or a specific software, but they are very interested in this process.
- *Data transformation* is the proces of converting data from different system and formats into one consistent format. In Albania banking this transformation is done through different applications, which are not integreted enough.

- *Data cleansing* is the process of removing errors from the input stream. In banking this process is done just for financial twice a year.
- *Data storage* contains the row data of the data warehouse. This process needs to be done automatically. It includes regular control, backup and recovery, monitoring every 24 hours and is considered completely.
- *Data warehouse* is not a unique and integrated in all Albanian banking industry. This activity is done by different tools for different applications

The process of analyzing the data

This phase regains data and presents it to the decision maker.



Picture Nr.4. Chart for the process of analyzes the data

- *Reporting and dashboard* tool need to be as clear and straightforward as possible to get the data to employees who may want it. In Albanian banks, there is not any integrated system for extracting any report from that. There are systems in some banks that extract cart switch transaction efficiency information from that.
- *OLAP* (OnLine Analytical Processing) permits the business person to present the data in multiple dimensions at time. In Albanian banks there are not specific analytical processes, but analyzes are done by statistical tools or by manager according to the reports.
- *OLTP* (OnLine Transaction Processing) refers to processing and response immediately the user requests from the system. An ATM (Automatic Teller Machine) is an example of

this. OLTP system are implemented in Albanian banking as the main database and all the processes done online on the data. OLTP should be monitored all the time and should updated regularly.

- *Data mining* in Albanian banking industry is not integrated as the classification and estimation system.

The process of taking action based on the data

This phase is the main factor of BI process. Decision making takes information from BI tools and defines the actions for the future. Decision makers of the organization can be considered our employees, partners and customers. The figure below shows the entire questionnaires with the average value calculated. For each phase is the output and the maturity score.



Picture Nr. 2. BI process maturity in Albanian banking

As it is shown all levels of the process are weighed 3.2 to 4.8 which means the BI process in Albanian banking industry is between level three and four, *Defined* and *Quantitatively Managed*, of CMMI.

Conclusions

According to the result from the questionnaires, the maturity level of BI in Albanian banking industry is at level three and four. It means that we have some defined processes for doing BI and they are established quantitatively. BI includes three main processes of:

- **Acquisition of the data** is at level four
- **Analysis of the data**, which are well defined and more applied. The worse sub process is data mining.

- **Taking action based on data** is at level three. The banks are interested in analyzing and taking action based on analyses the data. Practice processes are established in these banks.

In Albania, there is only one public bank and there is significant difference between the private one. As the result shows, public bank is using a more mature BI process in comparison with private ones.

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