

# Management Alert System

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## Abstract

The Inter-American Development Bank (IDB), located at Washington D.C., is flooded everyday with raw business data from Headquarters and its offices in Latin America and the Caribbean. As the amount of data grew, pouring through systems to unlock critical business intelligence was becoming increasingly time consuming and inefficient. The search is for a solution that automatically consolidated data and delivered the right information and analytics to the right people quickly and reliably. The idea is to develop a MAS, **Management Alert System**, based on Microsoft Technology that will allow IDB Executives to receive personalized, graphical information on company performance every time they open their Web browser, so they can turn data into information, information into insight, insight into action, and action into improved business operations.

The idea is to use **Business Intelligence** as a powerful, end-to-end solution that will allow the organization to optimize all operations. Close the loop on business insights and business activities, and align organizational strategies with execution excellence.

Since the invention of the database management system and advances in data storage technology, the organization have been collecting, processing, storing and accumulating vast amounts of data about people, locations, transactions, projects and events that for management are not easy to analyze and that's why, the main goal of the project is\_convert "Data into Business Intelligence"

## Table of Contents

1. Introduction	
Current Situation	4
2. Review	
Theoretical solution: Turning Data into Business Intelligence	
i. Data	5
ii. Information	6
iii. Analytic	6
iv. Knowledge	7
v. Wisdom	7
Practical Solution	8
Making the goals achievable	9
3. Methodology	
A way to perform	10
Delivering priorities	11
Analytical Graph Techniques	11
4. Results and Conclusion	
Results of the project and concluding remarks	
i. Deliver the right data	13
ii. To the right people	13
iii. At the right time	13

## Introduction

### Current Situation

The Inter-American Development Bank is the principal source of multilateral financing for economic, social and institutional development project in Latin America and the Caribbean. These include policy and sector reform programs and support for public and private investment. The Bank provides loan and technical assistance using capital provided by its member countries, as well as resources obtained in world capital markets through bond issues. The Bank also promotes and participates in a significant number of project co-financing arrangements with other multilateral, bilateral and private organizations. In its four decades of operation, the Bank has helped to transform Latin American and the Caribbean.

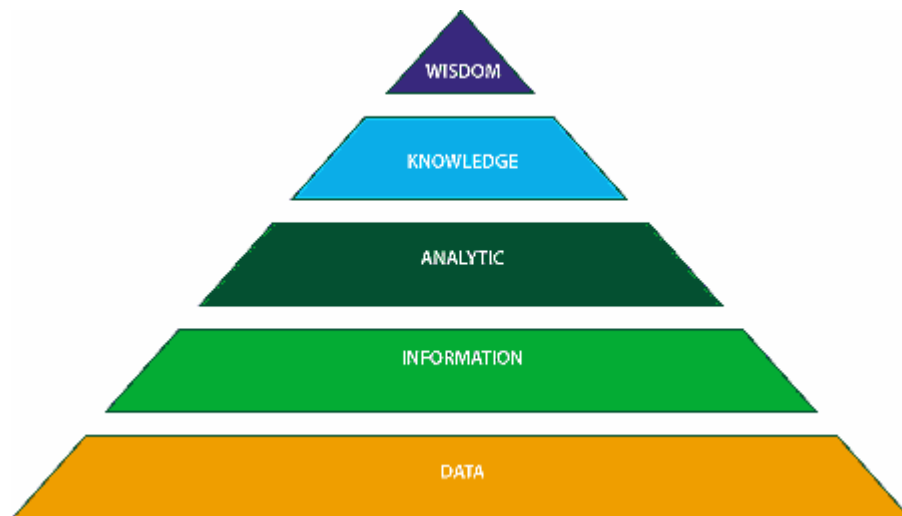
The Bank's total lending over 1961-2000 was more than \$106 billion for projects with a total cost of over \$263 billion. IDB loans have supported the construction and expansion of thousands of schools and hospitals, as well as more than 100 universities and scientific and technological institutions; installation of potable water and sewerage in thousand of communities; irrigation, agriculture and fisheries, industry and tourism projects; construction of tens of thousands of miles of roads; and installation of other transportation and communications infrastructure, as well as energy production facilities and transmission lines.

Nevertheless, IDB's headquarters was suffering from an information overload. Its Enterprise Resource Planning (ERP) systems groaned under the weight of raw data on financial transactions, loan development events and institution's performance. Extracting meaningful information is a time-consuming and labor-intensive job, often involving manual extractions through spreadsheets and loan related documentation. The result is that decision-makers often receive outdated reports, key performance indicators were not analyzed and lack of information on loan development process hindered IDB's ability to provide the very best levels of service to the Region.

## Review

### Theoretical solution: Turning Data into Business Intelligence

Within the information systems and databases of an organization lay tremendous opportunities in the data collected. The organization that can leverage technology to exploit their data will realize the benefits by creating a competitive advantage for itself. The competitive advantages are in the form of identifying trends, unusual patterns and hidden relationships that a team leader may not realize. This can be used to create new opportunities and give the organization an edge on its competition. Taking data and realizing the benefits involve several layers of understanding. Figure below depicts the transition of data into wisdom.



### Data

Since the invention of the database management system and advances in data storage technology, organizations have been collecting, processing, storing and accumulating vast amounts of data about people, locations, transactions, projects and events that can be easily analyzed. A great deal of this data is associated with the functional processes of the organization.

For example, the Bank systems collect data about the projects and loans on a specific timeline. Staff enters the information with whole description, team leader in charge, women participation, type of project, and country of development of the project, into the system. This process is normally called “data transaction”. Transaction processing systems are capable of collecting and processing voluminous amounts of data, which is the foundation for higher understanding.

## Information

As the number of transactions that are processed and collected by the Bank system increases, a wealth of data is collected. While each data element is a component of a transaction, what meaning can each data element provide? On an individual basis, data elements such as "Loan Type" do not provide meaning unless they are presented in conjunction with other data elements. The accumulation of data into a meaningful context provides information. Several applications that have ad hoc query and reporting capabilities provide users with the ability to extract data from a database and turn the data into information. These applications are normally not very "user friendly" and require some Technical Skills for end-users to understand and process. By taking data and placing it in a context that produces meaning, applications that have ad hoc query and reporting capabilities provide users with the ability to rise up from the data layer and create information.

## Analytic

While combining data and meaning to create information is extremely useful, separating or regrouping information extends the value of information. Applications that have online analytical processing (OLAP) capabilities provide users with the ability to analyze information and determine relationships, patterns, trends and exceptions. The data that was collected by the system and the information drawn from the data can be further analyzed by separating the information by period.

Some findings were developed after further analytics were performed on the information drawn from Bank's data. By performing analytics that entail separating or regrouping information, relationships, patterns, trends and exceptions can be identified to provide further understanding about the subject matter.

## Knowledge

The next level of elevated understanding is knowledge. Knowledge is different from data, information or analytics in that it can be created from any one of those layers, or it can be created from existing knowledge using logical inferences. Applications that have data mining capabilities provide users with the ability to identify hidden trends and unusual patterns within the data. These applications utilize various data mining techniques which are based on statistics and algorithms to provide users with the ability to discover knowledge within their data. Without the use of a data mining application, identifying hidden trends or unusual patterns within the data would be extremely time-consuming.

## Wisdom

Wisdom is the utilization of accumulated knowledge. Organizations that have been collecting data from their transactional systems have the opportunity to realize potential of the data as an asset to the organization and leverage that asset in a manner that provides greater understanding of the subject matter. Here is a classification of the various levels of understanding with the corresponding technology.

Level of Understanding	Technology
Data	Online transaction processing (OLTP) systems
Information	Ad hoc query and reporting applications
Analytic	Online analytical processing (OLAP) applications
Knowledge	Data mining applications
Wisdom	The human mind

While artificial intelligence attempts to emulate the human thought process, no technology has been able to replace the human mind. Most organizations have transitioned from data to analytics. Only those organizations that understand the value of data and technology can advance to knowledge and wisdom, which, has led to the competitive advantages they currently enjoy.

## The Practical Solution

Under the assumption that there should be a better way to manage information, a data analysis and distribution solution is going to be designed that will integrate seamlessly with IDB's existing applications. Using proven Microsoft products like Microsoft Enterprise Manager, Microsoft Analysis Manager, and Microsoft SQL Server 2000, a set of monitoring tools for performance control, via the Web are going to be developed to meet IDB's unique requirements.

These solutions will give IDB's managers full Online Analytical Processing (OLAP) functionality that will provide multidimensional views and allows intuitive manipulation of data. OLAP is going to be used for tasks such as trend analysis, comparing business units or products, monitoring business decisions and performing optimizations with what-if analysis. These solutions will be presented in a graphically rich "dashboard" interface. The system will not only extract, analyze, and store data, but will also automatically identify anomalies and dispatches alerts to key managers via e-mail. The application will be called "Management Alert System (MAS)" and it will be able to find critical data and determine a time and place where it belongs. There's no clutter; the data goes precisely to who needs it.

Given the current IT infrastructure at the IDB, Microsoft products have been chosen as the logical choice as the foundation of the business intelligence solution. The objective is to make these tools easy to use, easy to deploy and graphically enticing. With Microsoft software it is possible to achieve reliability and compatibility with IDB's existing productivity applications.

Other pluses for the IDB will be rapid implementation. But on accessible Microsoft applications, the entire system will take only six months to set up. That is considerably less than competing business intelligence application that didn't offer the same levels of customization and scalability.

The challenge will be to convince the rest of the IDB conglomerate to adopt a similar system. By delivering the right data to the right people more efficiently, dramatically increased knowledge dissemination and productivity will be achieved,

## Making the Goals Achievable

Business Intelligence will help me to implement strategies for long-term success by delivering a solution that needs to be:

- Complete -- providing data warehousing functionality, business intelligence tools, best-practice models, business analytics, and administrative resources.
- Action-oriented – the solution will need the inclusion of tools that support management of the organization in making informed decisions.
- Value-focused -- low total cost of ownership and fast return on investment.
- Integrated – Powered by a Microsoft technology platform, enabling seamless integration with Infrastructure, Data Management, and other components.
- Open – the application will need to support industry standards such as extensible Markup Language (XML); XML for Analysis (XMLA); OLE DB for OLAP (ODBO); Common Warehouse Metadata Interchange (CWMI); business application programming interface (BAPI) and the ABAP programming language.

## Methodology

### A way to perform

Everyday, the IDB accumulates an over-increasing amount of data about projects, loans, personnel information, and financial information, to name just a few sources. However, this data is locked away on multiple computers and in many different applications where it cannot be easily accessed for analysis. And often, when data is being analyzed, inappropriate tools are used, making it difficult to deliver the answers management needs.

Even worse, the analyses might be providing incorrect or inconsistent information and you don't even know it. There is a way, however, to unlock this information so that you will know your "information" better.

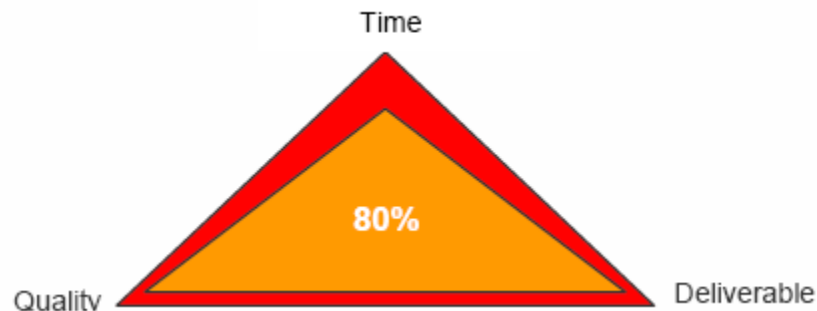
"It's called Business Intelligence".

Business Intelligence allows you to build a complete profile of your information with valuable demographic information – about loans, financial info, and what the project is about as well as where it is being developed. There is no better simple way for the IDB and no better time than now to invest in Business Intelligence. Just let's provide a single, safe and secure repository for business data, a data mart.

Data is taken from Bank systems, moved and transformed to a format specifically designed for analysis. With one location, Management in the organization knows where and how to get the data due to an easy and friendly Web System that I call MAS, the Management Alert System. Access to the data can be controlled so only those with the proper authority can see it. Procedures are put in place so the transfer takes place consistently every single day, and backups are done to protect the data in case of disaster. MAS will be the right tool to perform analyses quickly and accurately.

## Delivering Priorities

Deliver the priorities by following the 80/20 principles: 80% of benefits delivered within 20% of time. Committing to a deadline and focusing on key requirements provides early benefits for Management objectives.



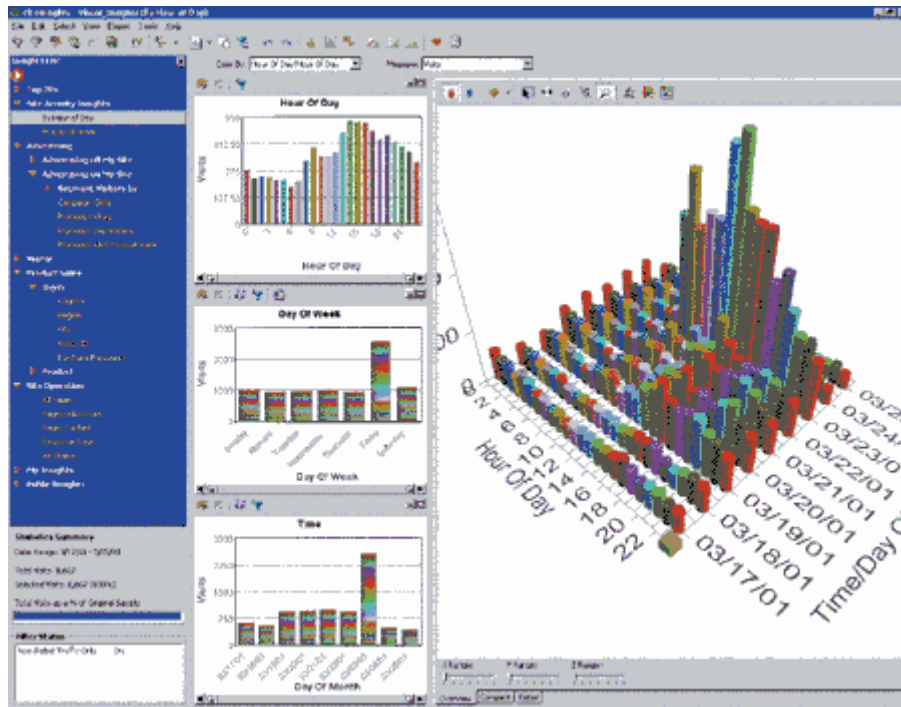
## Analytics

Analytics is the art of making sense of masses of data. Systems, data warehouses, and corporate portals and intranets provide plenty of raw materials to work with, but the analytic artisan needs a variety of tools and techniques to shape and mold this data into actionable knowledge.

Basic bar graphs and charts have been available almost as long as spreadsheets, but newer visualization models are gaining a foothold in traditional numeric applications as well as in hypertext, relational data, and unstructured data applications. The benefits of visualization vary by application and data type. In some cases, these techniques allow you to quickly compare the relative scale of data and detect patterns. In others, they provide a richer context for understanding data. And in still other cases, visualization techniques let you navigate related but distributed and unstructured data. Regardless of the particular technique, these visualization methods can reduce the time it takes to turn data into information, which in turn reduces decision-making time.

Among the most common business applications of visualization is multidimensional analysis. Star schemes and related models are widely used in business intelligence (BI) applications and lend themselves to visualization techniques because dimension-based structures provide an easily understood basis for comparisons.

At the IDB, and for the MAS project, Visualization techniques, due to dimension-based structures will be an easy way, for example, for comparison instead loan amounts, phase delays (each project has 5 phases) and other critical information. An operational Manager with this tool could have in Real Time, information regarding projects in countries for which the Department is responsible. Find below a possible example of dimension-based structures.



## Results and Conclusions

### Results of the project and concluding remarks

#### Deliver the right data

Pouring over spreadsheets for critical business intelligence is a thing of the past. MAS built on the SQL Server 2000 relational database, will perform analysis, extraction, transformation, processing and storage of data, slashing man-hours and reducing the risk of error. An intuitive target-setting algorithm enables users to rapidly and effortlessly set data-driven thresholds and triggers.

#### To the right people

The best information is worthless if it doesn't reach the people who need it. MAS tools integrate closely with the Exchange and Microsoft Outlook messaging and collaboration client, automatically identifying the data each IDB decision-maker will require and will dispatch it via e-mail or by Web portal. Data can also be sent to mobile platforms, included pocket PCs and via SMS to mobile phones.

#### At the right time

Up-to-the-minute information is vital at the IDB as in any other large organization, where identifying interruptions and bottlenecks in the lending process, allows for the implementation of timely corrective measures to achieve annual lending goals. With a robust technology foundation from Microsoft and data management by MAS, secure, accurate, real-time information is just a click away for IDB's decision makers.