Business Intelligence: Dashboard

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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.
The emergence of the data warehouse as a repository, advances in data cleansing, increased capabilities of hardware and software, and the emergence of the web architecture all combine to create a richer business intelligence environment than was available previously.

I. INTRODUCTION

Demand for Business Intelligence (BI) applications continues to grow even at a time when demand for most information technology (IT) products is soft. Yet, information systems (IS) research in this field is, to put it charitably, sparse. While the term Business Intelligence is relatively new, computer-based business intelligence systems appeared, in one guise or other, close to forty years ago.
BI as a term replaced decision support, executive information systems, and management information systems. With each new iteration, capabilities increased as enterprises grew ever- more sophisticated in their computational and analytical needs and as computer hardware and software matured. In this paper BI systems are defined as follows:
"BI systems combine data gathering, data storage, and knowledge management with analytical tools to present complex internal and competitive information to planners and decision makers."
Implicit in this definition is the idea (perhaps the ideal) that business intelligence systems provide actionable information delivered at the right time, at the right location, and in the right form to assist decision makers. The objective is to improve the timeliness and quality of inputs to the decision process, hence facilitating managerial work. Sometimes business intelligence refers
to on-line decision making, that is, instant response. Most of the time, it refers to shrinking the time frame so

that the intelligences still useful to the decision maker when the decision time comes. In all cases, use of business intelligence is viewed as being proactive. Essential components of proactive BI are:

- Real-time data warehousing,
- Data mining,
- Automated anomaly and exception detection,
- Proactive alerting with automatic recipient determination,
- Seamless follow-through workflow,
- Automatic learning and refinement,
- Geographic information systems
- Data visualization

II. LITERATURE SURVEY

Much has been said and written about BI systems. To begin the research, study begins with collecting information from periodicals, journals and reports. BI systems are used almost in all the sectors of industry for different purposes like reporting, analysis and decision making. This research concentrate specifically on its applications for the decision making process .This section provides information from several articles that I believe are relevant to this area.
Data warehouses and data marts first appeared to provide a centralized system for accessing data and making tactical decisions. Such systems were considered as to fall under the classification of BI. The main goal of a business intelligence system is to support the decision making process. A
BI system can be defined as _a process of turning data first into information and then into knowledge'.
There are several types of BI systems such as data warehouse and ERP currently used in organizations for high performance data management and data analysis. Though BI systems have removed the decentralization of data and progressed in managing information, an attempt has not been made to make the information available efficiently.

III. PROPOSED SYSTEM

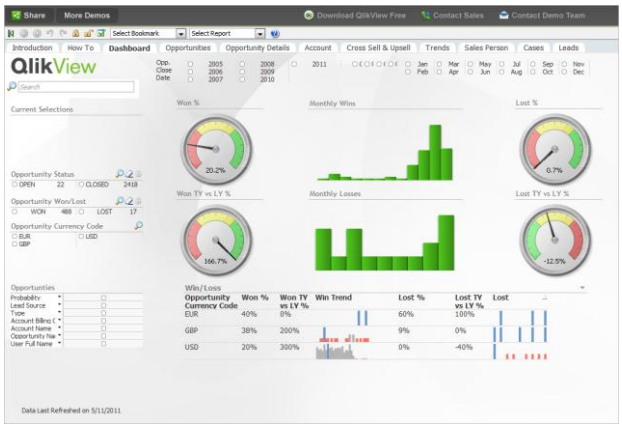

Fig 1: Proposed System I

It will display weekly and monthly sales figure or report of the product to the company executives.

Fig 2: Proposed System II

It shows month by month sales comparisons.
It shows how much profit and gain loss every month. So that executives can take necessity steps to improve profit.

IV. SYSTEM DESCRIPTION

Table 1: Current BI Techniques

TECHNIQUE	DESCRIPTION
Predictive modeling	Predict value for a specific data item attribute
Characterization and descriptive data mining	Data distribution, dispersion and exception
Association, correlation, causality analysis (Link Analysis)	Identify relationships between attributes
Classification	Determine to which class a data item belongs
Clustering and outlier analysis	Partition a set into classes, whereby items with similar characteristics are grouped together
Temporal and sequential patterns analysis	Trend and deviation, sequential patterns, periodicity
OLAP (OnLine Analytical Processing)	OLAP tools enable users to analyze different dimensions of multidimensional data. For example, it provides time series and trend analysis views.
Model Visualization	Making discovered knowledge easily understood using charts, plots, histograms, and other visual means
Exploratory Data Analysis (EDA)	Explores a data set without a strong dependence on assumptions or models; goal is to identify patterns in an exploratory manner

OLAP Servers**.**

Online Analytic processing (OLAP) supports operations such as filtering, aggregation, pivoting, rollup and drill-down on the multi-dimensional view of the data. OLAP servers are implemented using either a multidimensional storage engine (MOLAP); a relational DBMS engine (ROLAP) as the backend; or a hybrid combination called HOLAP.

MOLAP servers. MOLAP servers directly support the multidimensional view of data through a storage engine that uses the multidimensional array abstraction. They typically precompute large data cubes to speed up query processing. Such an approach has the advantage of excellent indexing properties and fast query response times, but provides relatively poor storage utilization, especially when the data set is sparse. To better adapt to sparse data sets, MOLAP servers identify dense and sparse regions of the data, and store/index these regions differently. For example dense sub-arrays of the cube are identified and stored in array format, whereas the sparse regions are compressed and stored separately.

- ETL METHODOLOGY

Intoduction of ETL

Many of the Business Intelligence tools look way cool. They provide graphs, moving targets, drill-downs, and drill-through. But much of the work in an operational data warehouse involves getting the data from operational systems into the data warehouse so that business intelligence tools can display those pretty pictures. This paper addresses the extraction, transformation, and load components of data warehousing. We'll look at issues in extraction, transformation, and loading and common approaches to loading data. We assume that source data structures are generally not similar to target data structures (e.g., flat files and normalized tables).

- The Plan

At the risk of being a bit simplistic, extraction, transformation, and load requires three main steps:

- Read the source data
- Apply business, transformation, and technical rules
- Load the data

Figure 5 shows this data flow. After the process reads the data, it must transform the data by applying technology, transformation, and business rules to it. An example of a transformation rule is: "Convert values in field x to integer." An example of a business rule is: "Customers must purchase products in the list of 'Washer', 'Dryer', "Refrigerator'." Applying business, transformation, and technology rules to data means generating keys, transforming codes, converting datatypes, parsing, merging, and many other operations. Once the data is in an appropriate technical and business format, the ETL process can load it into target tables. Note that these steps can potentially be performed many places in the system chain. For example, extract programs could

transform code values as they read from DB2 tables or VSAM datasets. A Perl program could parse a file and generate keys for use by bcp or DTS. Finally, stored procedures could split staging table rows in a set-oriented fashion.

Fig 3: High-Level Data Flow for Extraction, Transformation, and Load

- The Environment

The extraction, transformation, and load environment consists of three architectures (data, application, and technology), and a group of people (management, developers, and support). Figure 2 shows an abstract ETL environment.

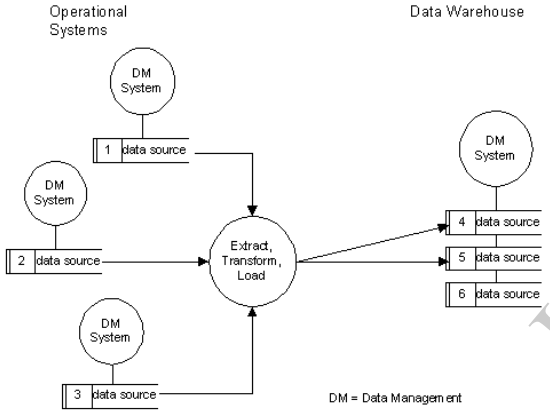

Fig 4: ETL Environment.

The data architecture includes the data itself and its quality as well as the various models that represent the data, data structures, business and transformation rules, and business meaning embodied *in* the data and data structures. Data architecture models include conceptual data models, logical data models, physical data models, and physical representations such as COBOL copybooks, C structures, and SQL DDL statements.

- Common Operations

Listed below are some common operations you may need to perform on the data you load.

Operation	**Possible Solution**
Generate a key	Identity column; primary key generator
Translate a code	if-then logic; lookup
Split data from one source into two targets	Multiple write statements
Merge two data sources into one	Join from multiple source tables
Log errors and progress information	Log/Schedule table that all load processes write to
Load code tables	Set of scripts

Table 2. Potential Load OperationS

Four Approaches

There are four common approaches to transforming and loading data into the data warehouse.

- Build a custom solution
- Buy a code generator
- Buy a data transformation engine
- Use a mixture of the above

V. IMPLEMENTATION

We have implemented 60% of the script and we got the following output.Fig 5 is the live raw extraction from web database.

OUTPUT

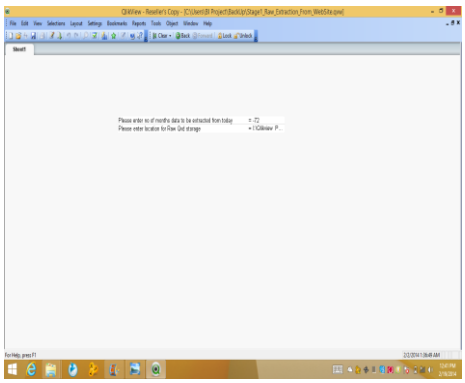

Fig 5: Raw extraction

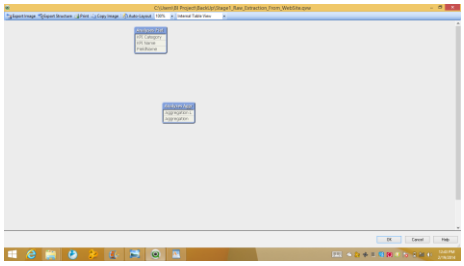

Fig 6: Table view of raw extraction

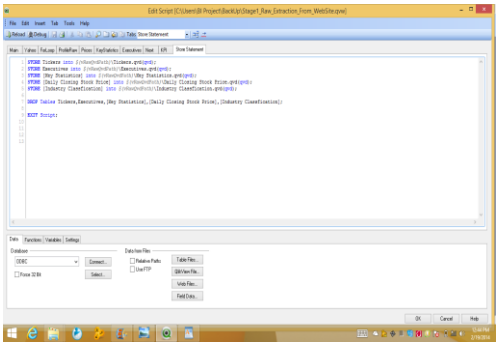

Fig 7: Script of Raw Extraction

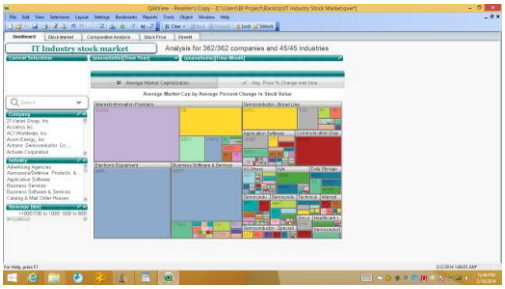

Fig 8: Dashboard

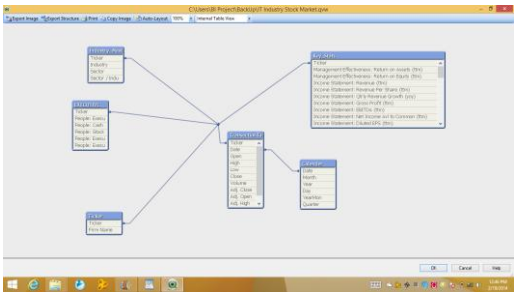

Fig 9: Tabular format of Dashboard

VI. FUTURE SCOPE

Scope of BI should include making the best use of information for strategic, tactical, and operational needs. Your purpose in building BI strategy is to help business with long-term planning, help middle management with tactical reporting, and helps operations with day-to-day decision making to run the business efficiently. BI is all about providing people with the information they need to do their jobs more effectively. A wide range of BI services need to be provided to meet a wide range of requirements. Scope of BI Strategy should be determined by the business drivers and business goals. Scope should always account for the changing business requirements to keep the BI strategy aligned with business. You should not limit your ability to apply the principles with a restrictive BI strategy. BI strategy should include a broad set of processes, technologies, and stakeholders for collecting, integrating, accessing, and analyzing information for the purpose of helping enterprise make better business decisions. BI solutions should enable users to be able to quickly adapt to new business requirements and evolving sources of information. Overall, BI vision should be planned in advance of any iteration being implemented. It is vital to establish a BI vision to ensure that implementation of specific components fits in the overall BI strategy. BI strategy should state and document the needs as identified by the stakeholders, highlighting how BI fits into the broader enterprise vision. BI strategy should take into consideration appropriate framework, methodology, processes, governance, systems, and technology to deliver value that aligns with the business objectives and priorities.

Fig 10 : BI aligning with enterprise strategy to deliver value

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