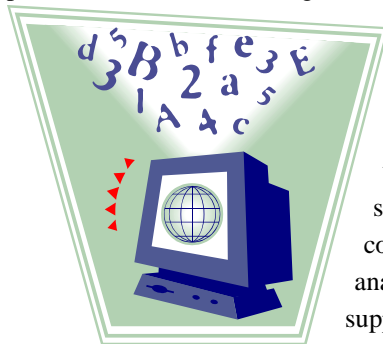


## THE POWER OF DATA WAREHOUSING

The changing nature of the delivery of health care due to regulation and competitive market forces has required the industry to be more efficient, effective, and customer oriented. Today, decision support systems (DSS) have assumed an increasingly important role in healthcare. Decision support systems are being applied in several areas, for instance, to determine cost-effectiveness of treatment protocols, understand cost structures of services, and implement process redesign initiatives. To be successful, health care management must identify and implement efficient, and robust systems to ensure their organization can survive in an increasingly cost-conscious and customer-oriented environment. Data warehousing is a key component of these decision support systems.

What is a data warehouse? A data warehouse is a platform that contains an organization's data in one



place in a centralized and normalized form for deployment to users. It fulfills simple reporting to complicated analysis, decision support, and executive level

reporting/archiving needs. Physically, a data warehouse is a repository of information that businesses need to thrive in the information age. Analytically, a data warehouse is a modern reporting environment that provides users direct access to their data. Data warehouse applications are retrieval/analysis/report/information oriented. The data sources for these types of applications are often triggered extracts from online transaction processing systems (OLTP) or operations support systems (OSS).

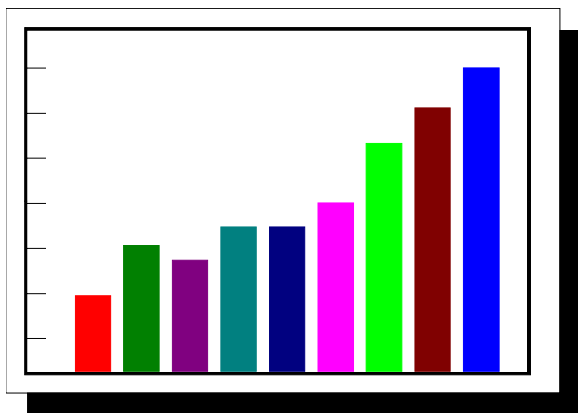
With data warehousing, an organization can incorporate business intelligence, and provide clinical, financial, and operational information in an integrated manner to management and staff. Is information accessible when needed? Is information available in a timely manner? Is information available in an effective manner? Is the available information valid? Data warehousing is the answer to these questions. With powerful set of tools, data warehousing maximizes a user's ability to leverage operational data for strategic benefits. With the help of data warehousing, organizations can compete across time by enabling employees to strategically learn from the past, adapt in the present, and position for the future with the help of the powerful tools supported by this technology.

During the course of business, employees perform many tasks, control processes, share information, and make many decisions. If better information is made available in a timely manner at the point of need, employees become more empowered, creating leverage for the organization. Through data warehousing, potent information is made available to all employees, allowing employees to solve problems, make good decisions, and so forth. This is why data warehousing is considered a rising-tide strategy. When the tide comes in, it raises all the ships in the harbor; similarly data warehousing raises the strategic acumen of all employees.

For health care organizations facing growing pressures to cut cost while maintaining quality patient care in today's competitive world, adopting a data warehouse strategy is a key decision to make. For this strategy to be successful in any health care setting, management must perform an analysis of current systems/processes to identify areas of improvement and target areas that can benefit from the power of data warehousing. By analyzing the goals and objectives of a health care facility and comparing it with the current decision support

systems in place, management will be able to determine how best to implement a data warehouse strategy.

In order to leverage an organization's operational data to create strategic acumen, data warehousing can be supported by decision support tools, such as data marts, OLAP and data mining tools. A data mart is a complete "pie-wedge" of the overall data warehouse pie, a restriction of the data warehouse to a single business process or to a group of related business processes targeted toward a particular business group.



On-line analytical processing (OLAP) solutions provide a multi-dimensional view of the data found in relational databases, which store data in a two-dimensional format. OLAP makes it possible to analyze potentially large amounts of data with very fast response times, and provides the ability for users to "slice and dice" through the data, and drill down or roll up through various dimensions as defined by the data structure. Data mining tools automate the analysis of data to find unexpected patterns or rules that management can use to tailor business operations. With data mining, the system researches the data and determines hidden patterns and associations, while the analyst determines what to do with the results.

Once management has decided to adopt a decision support strategy that involves the establishment of a data warehouse, steps must be taken to properly plan and implement the data warehouse application. First, the business objectives/goals of the medical facility

must be identified, followed by gap analysis for data needs and finalization of the hardware/software requirements. Second, the source systems used to collect data within the medical facility must be identified, along with resources required to establish the data warehouse and data marts for each of the service lines. This includes selection of the team that will be dedicated to implementation of the data warehouse. It is recommended that a decision support core team be designated as the primary repository for financial and clinical data. This core team must collaborate efforts with the IS team including representation from clinical departments, health information management, information services, and administration. This team is to work with the owners of the source systems to identify the core data elements to pass to the data warehouse. Third, the data to be fed in the data warehouse must be edited and cleansed. Also, timelines for downloading data from the source system to the data warehouse must be defined, along with audits within the warehouse to ensure the integrity of the data. Fourth, following the business objectives, data marts should be built and rolled out for identified service lines. Fifth and finally, an education program should be executed to enhance the transition of end users toward knowledge management.

In the information age, data warehousing is a powerful strategic weapon. It elevates the strategic acumen of all staff. When empowered employees use data warehouse and its associated analytical tools, they become components of a business intelligence system. Data warehousing strategy allows organizations to move from a defensive to an offensive decision-making position, while decreasing the cost associated with retrieving data.

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