Data warehouse in public schools of virginia

Education

In the State of Virginia, there was one county that actively pursued educational system that is decided and molded through data-driven inputs (Flaherty 2004). Hanover County Public Schools acquired the Instructional Decision Support System (IDSS) through months of research that provided data regarding the level of student achievement. Through this, county schools leaped from traditional subjective decision framework into a more objective process of education management.

The problem in the traditional approach was the impediment brought about by the regulation called No Child Left Behind (NCLB) that significantly reduced professional merits of subjective thinking. With IDSS, not only Hanover County Public Schools were able to comply with NCLB requirements but more importantly proved that a new era of teaching and learning was surfacing. However, there was still a big challenge that county schools faced which was related on updating IDSS based on current data of student achievement.

IDSS is a data warehouse that fed by various sources of data ready for access and run by a server. Its main customers are the principal, administrator, superintendent and other top-management in the county’s educational system. These actors also served as provider of data into IDSS through their electronic reports that will be shared by their peers. The problem was that users wanted a “ data day” concept to be followed by the IDSS for the purpose of deriving more valuable information. This demand was triggered by the fact that IDSS was capable of furnishing customized curricula based on the student achievement.

In effect, the more updated IDSS is, the timelier will be new curricula will be designed. The following scenario is attractive to the county’s educational system because administrators are assured that students are being taught on the basis of their ability to grasp, filter and retain information. Theories Data warehouse is like a huge basin that requires to be filled by data from certain sources in order to supply the same data when data mining tools are applied into it (Ye 2003). From the data source, there are several stages before data will be channeled to a data warehouse.

Data are required to undergo extraction, transformation and integration into the data warehouse. To retrieve inputs from the data warehouse that are designed to analyze and keep each aspect of data, data mining is therefore applied. Data in the data warehouse are organized through the interaction of key subject areas of the business which includes the customer, the vendor, the product, and business activities. Data warehouse is also composed of database, data stacking and retrieval tools, managerial platform and other applications used for mining data, querying, producing reports and creating the interface.

There are several principles that data warehousing are embedded particularly in terms of technical issues. From source document, the data will undergo “ filtering” through basic models; namely, enterprise, tabular and dimensional. Enterprise model captures data from source document of utmost priority reflected by tagging attribute names for ease of mapping data into the data warehouse. Tabular model addresses the data needs of functional departments such as sales data, number of customer complaints and the like.

Lastly, dimensional model is an extension of the tabular model in which mathematical analysis is applied into the data in order to come-up with organized way of producing performance reports and indicators. Data warehouses are means of strategic advantage only if they can provide the timely information to the right people (Weinberg 2006). This concept bring into being sustained competitive advantage and pro-active capabilities in decision-making. Further, since data warehouse is recommended for integrating information needs of the enterprise, participants must have tight coordination especially when data are being modeled (e. g. what should go in or out of the data warehouse).

As this process is not a technical decision but largely enterprise-level decision, it is crucial to get the cooperation of different stakeholders. With regards to functional departments, resist to change requires imposition of standards to mitigate the situation. Data warehouses are never been completed primarily due to continued growth of the business, changes in the operating environment and developments in technology.

They are always trailing that result from stock-piled data that should be applied with continuous effort of integration. Framework The issue discussed above is concerned on how Hanover County Public Schools can capture the real-time data in the IDSS at a minimum of “ day data” for timely decision-making not only on strategic matters but also operational aspects. The theories indicated that the process of feeding data into the data warehouse takes at least three stages (e. g. extraction, etc.) while retrieving those data from the data warehouse requires knowledge of data mining.

County schools had addressed the former issue by giving the overall responsibility of report generation to individual principals of each school. A technical person, on the other hand, aids in maintaining the website where county schools share the data on student achievement. In this manner, feeding the data warehouse is simplified with guarantees of authority and reliability from higher school authorities. Another concern that can contribute to attain “ day data” is the flawlessness of enterprise model as it is the basic structure of the data warehouse molded corporate-wide (O'Sullivan 1996).

Once few elements of building the enterprise model is lacking or excessive, real-time data will lack precision and important data that should have been included in the data warehouse would be disregarded by the system (Khalil & Harcar 1999). Careful deliberation on how to model the data warehouse should be initiated. This issue had been resolved by county schools as in the case of Stonewall Jackson Middle School. The principal together with the teachers went after “ data day” endeavor.

To succeed, daily meeting was conducted wherein recommendations were brought into consciousness at the end of the day using the data processed and derived from enterprise, tabular and dimensional models. Online testing for assessing the statistics, algebra and other numerical abilities of students were built into the database. As a result, dimensional outputs that were created have real-time data on the level of student achievement. This information will support the operational and strategic plans of the school particularly on designing the appropriate curriculum and teaching approach depending on test scores and performance.

Coordination was observed on IDSS was operated by county schools. Since this is key aspect of centralization, a more long-term and diverse benefit is derived from IDSS where 120 out of 132 schools of the state were sharing and providing individual data. The state superintendent had a clearer view on how to propose and execute far-reaching policies because each school was connected and operate IDSS daily. To prevent bottlenecks and inefficiency, the server must be powerful enough to handle simultaneous transactions without interference.

Security is also of parallel importance as data can be corrupted and unnecessary viewed by outsiders. Continuous training was provided by county schools to users to improve the timeliness of data as the process of transformation is known to the user. Data mining was also easy because the interface of the website was made user-friendly. The data that is shared by county schools also have flexibility (e. g. state/ county/ specific school view) and depth (e. g. student achievement data goes as far as 1999 to present).