A Multidimensional Decision Support system for Hospital Management

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INTRODUCTION

The Balanced Scorecard performance measurement framework[1] links performance indicators in four areas : customer; internal; financial; and learning. In a previous paper[2], we have described how we used this methodology to develop customized decision support systems which not only made relevant data accessible to different hospital management teams, but which also provided a context for integrated decision making.

Results of our multimethod evaluation indicated that the process of developing a Balanced Scorecard helped management teams to define meaningful and measurable strategic objectives. The Balanced Scorecard helps management teams to filter the massive flow of management data and to focus on the most important information. On the basis of this positive, formative evaluation, hospital senior executives decided to operationalize the Balanced Scorecard project across the campus.

MANAGEMENT DECISION SUPPORT ARCHITECTURE

Figure 1 illustrates the hospital decision support architecture.

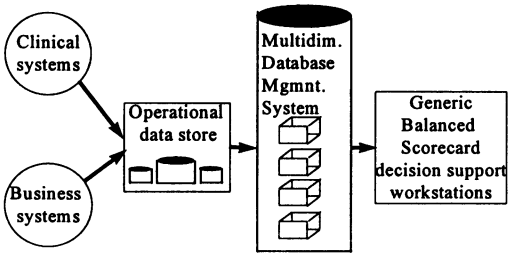

Figure 1: Hospital Decision Support System architecture

- The operational data store stages and aggregates data extracted from clinical and business transaction systems. The operational data store is a diverse suite of products including: file servers; databases; SQL query tools; mainframe database reporting tools; file transfer utilities; and connectivity and communications tools.
- The multidimensional database management system provides a logical organization of data that insulates users and data analysts from the physical operational data store environment. The system uses the ESSBASE multidimensional database management system. We have implemented separate, customized multidimensional domains for each management team.
- Powerful analytical processing tools allow users to manipulate and synthesize aggregate and granular information from multidimensional data models. We have augmented Microsoft Excel with a Visual Basic overlay that guides non technical users to the data they specify while still allowing power users advanced data manipulation functionality.

CONCLUSION

The Balanced Scorecard methodology links decision support tools with management processes in a manner that promotes integrated, balanced decision making. The combination of generic front end, user defined multidimensional domains and a well managed data flow offers management teams a customized decision support environment while minimizing the technical effort required to maintain the system.

References

1. Kaplan R, Norton D. Putting the balanced scorecard to work. Harvard Business Review 1993;Sep-Oct:134-147.
2. Gordon D, Chapman F, Kunov H, Dolan A, Carter M. Hospital Management Decision Support: The Balanced Scorecard Approach. 1997 AMIA Annual Fall Symposium. Nashville: Hanley and Belfus, 1997.

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