Analyzing and Reporting of BIT Students' Performance using Business Intelligence (BI) Tool

A DISSERTATION submitted to the Faculty of Information Technology in partial of fulfillment of the requirement for the degree Master of Science (Information Technology), University Utara Malaysia

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ABSTRAK

Secara khususnya, kajian ini adalah untuk menganalisa kemajuan akademik para pelajar yang memfokuskan kepada sampel pelajar yang mendaftar di dalam program Teknologi Maklumat (BIT) di Universiti Utara Malaysia (UUM). Sekumpulan para pelajar dalam bidang IT yang masih menuntut dan telah tamat pengajian telah di pilih untuk dianalisis tahap kemajuan mereka, samada dipengaruhi oleh latarbelakang pendidikan atau faktor lain. Pendekatan Perniagaan Pintar dicadangkan untuk diintegrasikan dengan sistem sedia ada di Fakulti Teknologi Maklumat (FTM). Sistem yang baru ini adalah untuk menganalisis data secara statistikal serta multidimensi dan seterusnya menjana laporan, contohnya untuk menghasilkan maklumat tahap kemajuan secara keseluruhan para pelajar BIT bagi membolehkan pihak akademik membuat keputusan. Keputusan mendapati bahawa kemajuan akademik para pelajar BIT secara keseluruhannya tidak diperangaruhi oleh latarbelakang pendidikan mereka. Sebaliknya ada faktor lain yang boleh mempengaruhi mereka seperti pemilihan program IT (samada pilihan pertama atau sebaliknya), subjek IT yang susah, minat dan komitmen para pelajar, kehadiran ke kelas dan juga kepuasan hati para pelajar terhadap kemudahan, servis dan suasana pembelajaran di UUM.

ABSTRACT

Specifically, this research of study analyzes the students' academic performance, which focuses on the sample of students who enrolled in Bachelor of Information Technology (BIT) program at University Utara Malaysia (UUM). The current BIT students as well as the graduated BIT students have been analyzed to determine the students' performance, whether it is influenced by their educational background or other factors. The Business Intelligence (BI) tool has been proposed into the current system at Faculty of Information Technology (FTM). This new system is to generate statistical and multidimensional analysis as well as to produce the report such as to determine the students' overall performance for academic decision making process. Findings indicated that the BIT students overall performance were not really influenced by their educational background. However it has been found out that there are several other factors that could affect their performance such as the choice of the program IT (whether first choice or not), the difficulty of the subjects, the level of students' interest and commitment, the percentage of class attendance and also the students' satisfaction towards facilities, services and environment at UUM.

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LIST OF ABBREVIATIONS

BI	Business Intelligence
FTM	Faculty of Information Technology
UUM	University Utara Malaysia
BIT	Bachelor Information Technology
IT	Information Technology
PHD	The degree of Doctor of Philosophy
HEA	Hal Ehwal Akademik
HEP	Hal Ehwal Pelajar
ASIS	Academic and Student Information System
STPM	Sijil Tinggi Pelajaran Malaysia
SPM	Sijil Pelajaran Malaysia
CGPA	Cummulative Grade Point Average
OLAP	Online Analytical Processing
DSS	Decision Support System
EIS	Executive Information System
ODS	Operational Data Stores
SAES	Student Automation Evaluation System
PADSS	Performance based Academic Decision Support System
RGS	Report Gallery System
SPSS	Statistical Package for the Social Sciences
SAS	Statistical Analysis System

CHAPTER 1

INTRODUCTION

1.1 The context of the study

Nowadays, Business Intelligence (BI) has emerged as one of the techniques that determine the success for most of the organization. Organizations from financial institution to higher educational today's data rich organizations store information in different source systems and on different platform, which normally many different departments often maintain that data. As a result, the users struggle to understand what data they have, where it is located and how to retrieve and transform it into business intelligent decision. Moreover, according to Moreira (2005), poor data quality can give a big impact to the organizations such as in inaccurate decision making, lost profits, increased fraud as well as faulty budgeting, operational delays and internal system failures.

Education is one of the areas that require the BI approaches in generating intelligent academic decision such as in enrollment, alumni, fundraising as well as generating student performance analysis. Universiti Utara Malaysia (UUM), is one of the world class universities in Malaysia that generates thousands of successful graduates. UUM consists of 13 faculties in which offers various

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REFERENCES

Abeyickrama, Y. (n.d). Retrieved 3 July, 2005 from htpp://www.businessintelligenceonline.info/articles/Business_intelligence_and_data_Warehousing_in_a_Bu.html

Anandarajan, M., Anandarajan, A., & Srivinasan, C.A. (2004). *Business Intelligence Techniques : A Perspective from Accounting and Finance.* New York: Springer-Verlag Berlin Heidelberg.

Azman Ta'a, Abdul Razak Saleh & Ruzelan, Khalid. (2005). The implementation of Student Automation Evaluation System Using SAS/IntrNet® . 19th Annual SUM Forum 2005

Begg, C., & Connoly, T. (2005). *Database Systems: A practical approach to design, implementation and management.* Addison-Wesley. 4th edition.

Biere, M. (2003). *Business Intelligence for the Enterprise.* New York: Prentice Hall

Cody, W. F., Kreulan, J T, Krishna V & Sprangler W S. (2002). The integration of Business Intelligence and Knowledge Management, IBM Systems Journal, Vol 41, No 4

Cognos Incorporation website (n.d). Retrieved 30 June 2005 from http://www.cognos.com/solutions/industry/education/higher.html

Data warehouse program at University Of Washington (n.d). Retrieved 30 September 2005 from http://ucs.admin.washington.edu/dwp/generalinfo/generalinfo.aspx

Deniz, Z., D. & Ersan., I. (2001). Using an academic DSS for student, course and program assessment, Retrieved 1 August 2005 from http://www.ineer.org/Events/ICEE2001/Proceedings/papers/264.pdf

Eckerson, W. (1998). The decision support sweet spot. Journal of Data Warehousing

Fleiss, J., L. (1981). *Statistical Methods for Rates and Proportions*. New York: Wiley

Fwu, J. C. (2005). Business Intelligence : A snapshot of Adoption Trend and Industry Development in Malaysia. 19th Annual SUM Forum 2005.

Gray, P. & Watson, H., J. (1998). *Desicion Support in the data warehouse*. New Jersey : Prentice Hall

Golfarelli, M., Rizzi, S., & Cella, I. (2004). Beyond Data warehousing: What's Next in Business Intelligence?. Retrieved 1 July 2005 from http://delivery.acm.org.eservice.uum.edu.my/10.1145/1040000/1031765/p1-golfarelli.pdf?key1=1031765key2=39625212

Gangadharan, R., G., & Swami, N, S. (2004). Business Intelligence System: Design and Implementation Strategies, Retrieved 3 July from htpp://ieexplore.ieee.org/ie15/9452/30001/01372391.pdf?tp=&arnumber=1372391&isnumber=30001

Haley, B (1998). Implementing the Decision Support in the data warehouse Infrastructurem Key Success Factors in Data Warehousing, University of Georgia

Matney, D., & Larson, D. (2004). The Four Components of BI Governance

Mohd Salleh Abu & Zainuddin Tasir. (2001). *Pengenalan kepada Analisis Data Berkomputer. SPSS 12.0 for Windows*. Kuala Lumpur: Venton Publishing

Moreira, F.Charles (2005). Why poor data quality must be avoided. The Star Online

Moss, L. T., & Atre, S. (2003). *Business Intelligence Roadmap : The complete Project Lifecycle for Decision-Support Applications*. Boston: Addison-Wesley

Norton, P. (1998). *Guide to Visual Basic 6*. Indianapolis: Sams Publishing

Nielsen, J. (1993). *Usability Engineering*. Massachusets Ave: Academic Press. Inc

Nin, L. (2004) SAS Awarded Business Intelligence Vendor of the Year by Frost & Sullivan. Jaring Internet Magazine

Sakaguchi, T. & Frolick, M., N. (1997). A review of the Data Warehousing Literature. Journal of Data Warehousing

SAS Institute website, Retrieved 1 July 2005 from http://www.sas.com/technologies/bi/

Shelly, B. G., Cashman, J. T., & Rosenblatt, J. H. (2001). *Systems Analysis and Design*. Boston : Course Technology

Simon, R.A., & Shaffer, L.S. (2001). *Data Warehousing and Business Intelligence for e-commerce*. San Diego: Academic Press

Sprague, R., H. (1980). A Framework for the development of decision support systems, MIS quarterly, 4(4)

Spil, T.A.M, Stegwee, R.A., & Teitink, C.J.A (2002). *Business Intelligence in Healthcare Organizations*. Proceedings of 35th International Conference

Thomas, R., Murray (2003). *Blending Qualitative & Quantitative Research Methods in Theses and Dissertations*. California : Corwin Press, Inc

Wageningen, U., R (2004). Semi-structured interviewing. Retrieved 3 August, 2005 from http://www.iac.wur.nl/ppme/content.php?ID=353&IDsub=406

Wei, X., Xiaofei, X., Lei, S., Quanlong, L.,& Hao, L. (2001) Business Intelligence Based Group Decision Support System. Retrieved 1 July 2005 from http://ieeexplore.ieee.org/ie15/7719/21184/00983534.pdf?tp=&arnumber=983534&isnumber=21184