Using Data Model Patterns to Explore Conceptual Model of Data Warehouse

E-mail: 9314349@ mail.dyu.edu.tw

ABSTRACT

Data warehousing has become an important issue for large-sized enterprises recently. However, the failure rate of constructing data warehouses is still extremely high due to the difficulty of defining user requirements at the initial stage. The purpose of this research is to seek to use Data Model Patterns proposed by Hay [24] to improve the requirements analysis for data warehouse systems. This research has used a case study (Traffic violation regulation of Changhua Motor Vehicle Station) to implement the proposed ideas. The results of this research indicated that by using Data Model Patterns to improve requirements analysis of data warehouses, user requirements can be defined quite precisely and consequently the dimensional model of data warehouses can be designed quite exactly. Based on the results of this case study, this research has proposed an approach to requirements analysis of data warehouses. This approach includes four steps: analyze business documents, use Hay's [24] Data Model Patterns to draw a conceptual model of business, conjecture summary information for decision-marking and define user requirements based on conjectured summary reports. The main contribution of this research is to propose a potentially new requirements analysis method to mitigate the problem of defining user requirements for data warehouse systems.

Keywords : Data Warehouse, Data Model Patterns, Conceptual Model, User Requirements Analysis.

Table of Contents

REFERENCES

[1]   (85)   :
[2]   (88)   (Data Warehouse)   48   1-15
[3]   (90)   84   2-9
[4]   (88)   (1) RUN!PC   60   277-288
[5]   (91)   OLAP
[6]   (92)
[7]   (89)   240   62-64
[8]   (92)
[9]   (90)
[10]   (92)   :
[11]   (90)   :
[12]   (87)   211   78-91
[13] Barker, R., CASE*METHODTM: Entity Relationship Modeling, Oracle Corporation UK Limited, Addision-Wesley Publishing Company, 1992.
[14] B?kgaard, L., Event-entity-relationship modeling in data warehouse environments, Proceedings of the 2nd ACM international workshop on Data warehousing and OLAP, pp.9-14, November 1999.
[15] Berry, M. J. A., and linoff, G., Data Mining Techniques For Marketing Sale and Customer Support, John Wiley &Sons, Inc., Canada., 1997.
[16] Chaudhuri, S. and Dayal, U., An overview of data warehousing and OLAP technology, SIGMOD Record, (26, 1), pp.65-74, March 1997.

[17] Codd, E. F., Extending the database relational model to capture more meaning, ACM Trans. Database Syst. 4, 4 Dec., pp.397-434, 1979.

[18] Fayyad, U., Piatetsky-Shapiro, G. and Padhraic, S., From Data Mining to Knowledge Discovery in Databases, AI magazine, pp.37-54, 1996.

[19] Golfarelli, M., Maio, D. and Rizzi, S., Conceptual Design of Data Warehouses from E/R Schemes, System Sciences, Proceedings of the Thirty-First Hawaii International Conference on, 7, pp.334-343, 1998.

[20] Gray, P. and Waston, H. J., Present and Future Directions in Data Warehousing, ACM SIGMIS Database, pp.83-90, 1998.

[21] Gutierrez, A. and Marotta, A., An Overview of Data Warehouse Design Approaches and Techniques, 2000.

[22] Han, J. and Kamber, M., Data Mining: Concepts and Techniques, Morgan Kaufmann Publishers, 2001.

[23] Hammer, M. and Mc Leod D., Database description with SDM: a semantic database model, ACM Trans. on Database Systems (TODS), (6, 3), pp.351-386, Sept. 1981.

[24] Hay, D. C., Data Model Patterns : Conventions of Thought, Dorset House Publishing, New York, 1996.

[25] Hoven, J. V. D., Data Warehousing: Bringing It All Together, Information System Management, pp.92-95, Spring 1998.

[26] Inmon, W. H., Building the Data Warehouse, John Wiley & Sons, New York, 1996.

[27] Inmon, W. H., The Data Warehouse and Data Mining, Communications of the ACM, (39, 11), pp.49-50, Nov. 1996.

[28] Kelly, S., Data Warehouse: the Route to Mass Customization, John Wiley & Sons, New York, 1996.

[29] Kelly, S., Data Warehousing in Action, John Wiley & Sons, New York, 1997.

[30] Kimball, R., The Data Warehouse Toolkit: Practical Techniques for Building Dimensional Data Warehouse, John Wiley & Sons, John Wiley & Sons, New York, 1996.

[31] Kimball, R., A Dimensional Modeling Manifesto, DBMS, pp. 58-70, Aug. 1997.

[32] Martyn, T., Implementation Design for Databases: The 'Forgotten' Step, IEEE, IT Pro March/April, pp.42-49, 2000.

[33] Murtaza, A., A Framework for Developing Enterprise Data Warehouse, Information System Management, pp.21-26, Fall 1998.

[34] Paim, F. R. S. and de Castro, J. F. B., DWARF: An Approach for Requirements Definition and Management of Data Warehouses Systems, Requirements Engineering Conference, 2003. Proceedings. 11th IEEE International, pp.75-84, 8-12 Sept. 2003.

[35] Peckham, J. and Maryanski, F., Semantic Data Models, ACM Computing Surveys, (20, 3), pp.153-189, September 1988.

[36] Rodgers, U., Oracle: A Database Developer's Guide, Prentice-Hall Inc., 1991.

[37] Sapia, C., Blaschka, M., Hofling, G., and Dinter B., Extending the E/R Model for the Multidimensional Paradigm, Advances in Database Technologies, Springer-Verlag, pp.105-116, 1998.

[38] Schau, R., Ballard, C., Herreman, D., Bell, E. and Kim, A., Data Modeling Techniques for Data Warehousing, Advances in Database Technologies, redbook, International Technical Support Organization, 1998.

[39] Tryfona, N., Busborg, F. and Christiansen, B., StarER: A Conceptual Model for Data Warehouse Design, Proceedings of the 2nd ACM international workshop on Data warehousing and OLAP, pp.3-8, 1999.

[40] Widom, J., Research problems in data warehousing, Proceedings of the fourth international conference on Information and knowledge management, pp.25-30, 1995.

[41] Winter, R. and Strauch, B., A Method for Demand-driven Information Requirements Analysis in Data Warehousing Projects, System Sciences, Proceedings of the 36th Annual Hawaii, 2003.

[42] The Standish Group   http://www.standishgroup.com/