

實體與其關連的結構特性

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摘要

實體關連圖是由實體，實體屬性與實體之間的關連所構成的一種圖形語言，不但可以將企業經營的業務資料模型化以及用來輔助資料庫的設計工作，同時也可以作為一種溝通的工具。在資訊管理的領域中，實體關連圖是最常使用與最重要的一項模型工具。實體關連圖的製作有其基本的語法結構以及圖形所代表的語意資訊，本研究主要探討實體關連圖中實體的配置關係以及實體例子之間的對應關係。本研究以內容分析法中的量化統計與質化分析做為主要研究方法。在搜集實體關連圖樣本的過程中，雖然發現有不少的相關文獻，但是合適的研究樣本卻不多，因為我們的目的是要搜集和分析完整的圖例，以及它所伴隨的問題領域脈絡。在研究過程中，我們發現實體關連圖中的實體圖形在經過重新配置以及改變相互間的對應關係之後，整個實體關連圖會呈現出一種具有方向性的結構特性，這種結構慣例來自資料模型樣式[21]以及塔斯梅尼亞模型[14]的啟示。根據這種結構特性所製作的實體關連圖，對人員的溝通以及資料庫的設計工作上會有明顯的幫助。

關鍵詞：資料模型、資料模型樣式、實體關連圖、塔斯梅尼亞模型

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參考文獻

- [1] 包冬意，(民 85)，物件導向分析與設計:方法導引，松崗電腦圖書資料股份有限公司.
- [2] 吳琮璠、謝清佳(民86)，資訊管理:理論與實務，智勝文化事業有限公司.
- [3] 姚修慎，(民 87)，資料庫系統概論，揚智文化事業股份有限公司.
- [4] 曹錦芳，(民 81)，系統分析與設計，儒林圖書有限公司.
- [5] 楊亨利等，(民 87)，系統分析與設計，國立空中大學.
- [6] 蔡邦仁，(民 87)，系統分析與設計，滄海書局.
- [7] 簫偉郎，(民 82)，結構化分析與設計:理論與實務應用，智勝文化事業有限公司.
- [8] BATINI,C.,CERI,S.,AND NAVATHE S.,(1992),CONCEPTUAL DATABASE DESIGN, BENJAMIN/CUMMINGS , REDWOOD CITY,CA.
- [9] BACHMAN,C.,(1977), THE ROLE CONCEPT IN DATA MODELS, IN PROCEEDINGS OF THE 3RD INTERNATIONAL CONFERENCE ON VERY LARGE DATA BASES (TOKYO, OCT 6-8) IEEE,NEW YORK. PP. 464- 474.
- [10] BOOCHE, G., RUMBAUGH,J.,AND JACOBSON,I., (1999), THE UNIFIED MODELING LANGUAGE USER GUIDE, ADDISON WESLEY LONGMAN, INC.
- [11] BARKER, R., (1995), CASE*METHOD?: ENTITY RELATIONSHIP MODELING, ORACLE CORPORATION UK LIMITED, ADDISION-WESLEY PUBLISHING COMPANY, 1992.
- [12] CZEJDO, B., ELMASRI ,R., RUSINKIEWICZ, M., AND EMBLEY, D., (1990), A GRAPHICAL DATA MANIPULATION LANGUAGE FOR AN EXTENDED ENTITY-RELATIONSHIP MODEL, IEEE COMPUTER 23(3) PP. 26-35.
- [13] CODD,E.F., (1970), A RELATIONAL MODEL OF DATA FOR LARGE SHARED DATA BANKS, COMMUN. ACM 13,6 JUNE, PP. 377-387.
- [14] CODD,E.F.,(1979),EXTENDING THE DATABASE RELATIONAL MODEL TO CAPTURE MORE MEANING, ACM TRANS. DATABASE SYST. 4, 4 DEC., 397-434.
- [15] CHEN, P. P., (1997), ENGLISH, CHINESE AND ER DIAGRAMS, ELSEVIER SCIENCE B.V., DATA & KNOWLEDGE

ENGINEERING 23, PP. 5-16.

- [16] CHEN,P.P.,(1992) ENTITY-RELATIONSHIPS VS. OBJECT-ORIENTATION, IN: G. PERNUL, A.M. TJOA (EDS.), PROC. 11TH INT. CONF. ON ENTITY-RELATIONSHIP APPROACH, OCTOBER, PP.1-2.
- [17] CHEN, P.P., (1976), THE ENTITY-RELATIONSHIP MODEL : TOWARD A UNIFIED VIEW OF DATA, ACM TRANSACTION ON DATABASE SYSTEM, VOL.1, NO.1,MARCH, PP. 9-36.
- [18] DATE,C.J.,(1991), AN INTRODUCTION TO DATABASE SYSTEM. ADDISN-WESLEY PUBLISHING COMPANY , INC.
- [19] DRUCKER, P. F., (1999), MANAGEMENT CHALLENGES FOR THE 21ST CENTURY, HARPER BUSINESS, NEW YORK.
- [20] GORMAN, K., & CHOOBINEH, J., (1991), THE OBJECT-ORIENTED ENTITY-RELATIONSHIP MODEL (OOERM), J. MANAGEMENT INF. SYS. 7(3), PP. 41-65.
- [21] HAY, D. C., (1996), DATA MODEL PATTERNS : CONVENTIONS OF THOUGHT, DORSET HOUSE PUBLISHING, NEW YORK.
- [22] HANSEN, G.W. & HANSEN,J.V.,(1992), DATABASE MANAGEMENT AND DESIGN, PRENTICE-HALL.
- [23] HAMMER, M. & MCLEOD, D.,(1978), THE SEMANTIC DATA MODEL: A MODELLING MECHANISM FOR DATABASE APPLICATIONS, IN PROC. ACM SIGMOD INT. CONF. MANAGEMENT OF DATA, AUSTIN, TEX.
- [24] HAMMER, M. & MCLEOD, D.,(1981),DATABASE DESCRIPTION WITH SDM: A SEMANTIC DATABASE MODEL-EL, ACM TRANSACTIONS ON DATABASE SYSTEM, VOL. 6,NO.3,SEPTEMBER,PP. 354-386.
- [25] HULL, R. & KING, R., (1987), SEMANTIC DATABASE MODELLING: SURVEY, APPLICATIONS, AND RESEARCH ISSUES, ACM COMPUTING SURVEYS 19 (3) PP. 201-260.
- [26] HOHENSTEM, U. & GOGOLLA M.,(1988) A CALCULUS FOR AN EXTENDED ENTITY-RELATIONSHIP MODEL-EL INCORPORATING ARBITRARY DATA OPERATIONS AND AGGREGATE FUNCTIONS, IN: C. BATINI (ED.), ENTITY-RELATIONSHIP APPROACH: ABRIDGE TO THE USER, PROC. 7TH INT. CONF. ON ENTITY- RELATIONSHIP PPROACH, 1988, ROME, ITALY, NORTH-HOLLAND.
- [27] KAPPEL, G. & SCHREFL, M., (1988), A BEHAVIOR-INTEGRATED ENTITY-RELATIONSHIP APPROACH FOR THE DESIGN OF OBJECT-ORIENTED DATABASES, IN: C. BATINI (ED.), ENTITY-RELATIONSHIP APPROACH: A BRIDGE TO THE USER, PROC. 7TH INT. CONF. ON ENTITY-RELATIONSHIP APPROACH, 1988, ROME, ITALY, NORTH-HOLLAND.
- [28] KING, R. & MCLEOD, D., (1984), A UNIFIED MODEL AND METHODOLOGY FOR CONCEPTUAL DATABASE DESIGN, IN ON CONCEPTUAL MODELLING, PERSPECTIVES FROM ARTIFICAL INTELLIGENCE, DATA-BASES, AND PROGRAMMING, M. L. BRODIE, J. MYLOPOULOUS, AND J. W. SCHMIDT, EDS. SPRING-ER-VERLAG, NEW YORK. PP, 313-327.
- [29] KING, R. & MCLEOD, D., (1986), THE EVENT DATABASE SPECIFICATION MODEL, IN PROCEEDINGS OF THE 2ND INTERNATIONAL CONFERENCE ON DATABASES: IMPROVING USABILITY AND RESPONSIVENESS (JERUSALEM, ISRAEL). IIPA, PP. 299-322.
- [30] KESH, S.,(1995), EVALUATING THE QUALITY OF ENTITY RELATIONSHIP MODELS, ELSEVIER SCIENCE B.V. INFORMATION AND SOFTWARE TECHNOLOGY. 37 (12) PP. 681-689.
- [31] KENT, W., (1979), LIMITATIONS OF THE RECORD BASED INFORMATION MODELS, ACM TRANS. DATA-BASE SYST. 4,1 MAR,PP.107-131.
- [32] LOOMIS, M., (1995), OBJECT DATABASES: THE ESSENTIALS, ADDISON-WESLEY, READING, MA.
- [33] MARTIN,J.,& ODELL,J.J.,(1992), OBJECT-ORIENTED ANALYSIS AND DESIGN, ENGLEWOOD CLIFFS, NJ: PRENTIC-HALL.
- [34] MARTYN, T., (2000), IMPLEMENTATION DESIGN FOR DATABASES: THE 'FORGOTTEN' STEP, IEEE, IT PRO MARCH/APRIL, PP.42-49.
- [35] MARKOWITZ, V. M. & SHOSHANI, A., (1992), REPRESENTING EXTENDED ENTITY-RELATIONSHIP STRUCTURES IN RELATIONAL DATABASE: A MODULAR APPROACH, ACM TRANS. ON DATABASE SYSTEMS 17 (3), PP.423-464.
- [36] MCGEE, W.C., (1976), ON USER CRITERIA FOR DATA MODEL EVALUATION, ACM TRANSACTIONS ON DATABASE SYSTEMS, VOL. 1, NO. 4, DECEMBER, PP. 370-387.
- [37] NAVATHE, S., ELMASRI, R., AND LARSON, J., (1986), INTEGRATING USER VIEWS IN DATABASE DESIGN, IEEE COMPUTER 19(1) PP. 50-62.
- [38] NAVATHE,S.& PILLALAMARRI,M.,(1988), TOWARD MAKING THE ER APPROACH OBJECT-ORIENTED, IN: C. BATINI (ED.), ENTITY-RELATIONSHIP APPROACH: A BRIDGE TO THE USER, PROC. 7TH INT. CONF. ON ENTITY-RELATIONSHIP APPROACH, 1988, ROME, ITALY, NORTH-HOLLAND.
- [39] PECKHAM,J.& MARYANSKI,F.,(1988) SEMANTIC DATA MODELS, ACM COMPUTING SURVEYS, VOL. 20, NO. 3, SEPTEMBER, PP. 153-189.
- [40] POTTER, W. D. & TRUEBLOOD, R. P., (1988), TRADITIONAL, SEMANTIC, AND HYPER-SEMANTIC APPROACHES TO DATA MODELING, IEEE.
- [41] RODGERS, U., (1991), ORACLE:A DATABASE DEVELOPER'S GUIDE, PRENTIC-HALL, INC.

- [42] RAMESH, V. & GLENN, B.J., (1999), EXPRESSING CASUAL RELATIONSHIPS IN CONCEPTUAL DATA BASE SCHEMAS, ELSEVIER SCIENCE INC. THE JOURNAL OF SYSTEMS AND SOFTWARE 45, PP. 225-232.
- [43] SAIEDIAN, H., (1997), AN EVALUATION OF EXTENDED ENTITY-RELATIONSHIP MODEL, ELSEVIER SCIENCE B.V., INFORMATION AND SOFTWARE TECHNOLOGY 39, PP. 449-462.
- [44] SCHMID, H. A., & SWENSON, J. R., (1975), ON THE SEMANTICS OF THE RELATIONAL DATA MODEL, IN PROCEEDINGS OF THE 1975 SIGMOD CONFERENCE, PP. 211-223.
- [45] SMITH, J. M., & SMITH, D. C. P., (1977), DATABASE ABSTRACTIONS: AGGREGATION AND GENERALIZATION, ACM TRANSACTIONS ON DATABASE SYSTEMS, VOL. 2, NO. 2, JUNE, PP. 105-133.
- [46] SHOVAL, P. & SHIRAN, S., (1997), ENTITY-RELATIONSHIP AND OBJECT-ORIENTED DATA MODELING : EXPERIMENTAL COMPARISON OF DESIGN QUALITY, ELSEVIER SCIENCE B.V. DATA & KNOWLEDGE ENGINEERING 21, PP. 297-315.
- [47] SHLAER, S. & MELLOR, S.J., (1992), OBJECT LIFECYCLES: MODELING THE WORLD IN STATES, PRENTICE-HALL, INC.
- [48] TIWANA, A., (2000), THE KNOWLEDGE MANAGEMENT TOOLKIT : PRACTICAL TECHNIQUES FOR BUILDING A MANAGEMENT SYSTEM, PRENTICE-HALL, INC.
- [49] TSICHRITZIS, D. & LOCHOVSKY, F., (1982), DATA MODELS, PRENTICE HALL, ENGLEWOOD CLIFFS, N.J.
- [50] TOREY, T., YANG, D., AND FRY, J., (1986), A LOGICAL DESIGN METHODOLOGY FOR RELATIONAL DATABASES USING THE EXTENDED E-R MODEL, ACM COMPUTING SURVEYS, 18 (2): PP. 197-222.
- [51] WHITTEN, J.L., & BENTLEY, L. D., (1998), SYSTEMS ANALYSIS AND DESIGN METHODS, McGRAW-HILL, INC.
- [52] WU, M. S. & WU, SHIH-YEN, (1994), SYSTEMS ANALYSIS AND DESIGN, WEST PUBLISHING COMPANY.
- [53] WAND, Y., STOREY, V.C., AND WEBER, R., (1999), AN ONTOLOGICAL ANALYSIS OF THE RELATIONSHIP CONSTRUCT IN CONCEPTUAL MODELING, ACM TRANSACTIONS ON DATABASE SYSTEMS, VOL. 24, NO. 4, DECEMBER, PP. 494-528.