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Knowledge Based Consolidation of UML Diagrams for Creation of Virtual Enterprise

PDF (Size: 1042KB) PP. 159-177 DOI: 10.4236/iim.2010.23019

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ABSTRACT

In this paper we address the problem related to determination of the most suitable candidates for an M&A (Merger & Acquisition) scenario of Banks/Financial Institutions. During the pre-merger period of an M&A, a number of candidates may be available to undergo the Merger/Acquisition, but all of them may not be suitable. The normal practice is to carry out a due diligence exercise to identify the candidates that should lead to optimum increase in shareholder value and customer satisfaction, post-merger. The due diligence ought to be able to determine those candidates that are unsuitable for merger, those candidates that are relatively suitable, and those that are most suitable. Towards achieving the above objective, we propose a Fuzzy Data Mining Framework wherein Fuzzy Cluster Analysis concept is used for advisability of merger of two banks and other Financial Institutions. Subsequently, we propose orchestration/composition of business processes of two banks into consolidated business process during Merger & Acquisition (M&A) scenario. Our paper discusses modeling of individual business process with UML, and the consolidation of the individual business process models by means of our proposed Knowledge Based approach.

KEYWORDS

Knowledge Base, Predicate Calculus, Service Oriented Architecture, UML, Fuzzy Data Mining, Cluster Analysis

Cite this paper

D. Chanda, D. Majumder and S. Bhattacharya, "Knowledge Based Consolidation of UML Diagrams for Creation of Virtual Enterprise," *Intelligent Information Management*, Vol. 2 No. 3, 2010, pp. 159-177. doi: 10.4236/iim.2010.23019.

References

- [1] T. Y. Kim, S. Lee, K. Kim, and C. H. Kim, "A modeling framework for agile and interoperable virtual enterprises," *Computers in Industry*, Vol. 57, pp. 204–217, 2006.
- [2] F. F. Chua and C. S. Lee, "Collaborative learning using service-oriented architecture: A framework design," *Knowledge-Based Systems*, Vol. 22, pp. 271–274, 2009.
- [3] W. M. P. van der Aalst, "Business process management demystified: A tutorial on models," *Systems and Standards for Workflow Management*.
- [4] T. T. Ram Mohan, "Bank consolidation: Issues and evidence," *Economic and Political Weekly*, pp. 1151–1161, 2005.
- [5] D. Beyer, A. Noack, and C. Lewerentz, "Efficient relational calculation for software analysis," *IEEE Transactions on Software Engineering*, Vol. 31, No. 2, pp. 137–149, February 2005.
- [6] G. Candido, J. Barata, A. Walter Colombo, and F. Jammes, "SOA in reconfigurable supply chains: A research roadmap," *Engineering Applications of Artificial Intelligence*, Vol. 22, pp. 939–949, 2009.
- [7] M. Crasso, A. Zunino, and M. Campo, "Easy web service discovery: A query-by-example approach," *Science of Computer Programming*, Vol. 71, pp. 144–164, 2008.
- [8] O. El-Gayar and K. Tandekar, "An XML-based schema definition for model sharing and reuse in a

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- [9] M. L. Lopez-Sanz, C. J. Acuna, C. E. Cuesta, and E. Marcos, "Modelling of service-oriented architectures with UML," *Electronic Notes in Theoretical Computer Science*, Vol. 194, pp. 23– 37, 2008.
- [10] C. Pahl, "Semantic model-driven architecting of service-based software systems," *Information and Software Technology*, Vol. 49, pp. 838– 850, 2007.
- [11] S. Arroyo, M. -A. Sicilia, and J. M. Dodero, "Choreography frameworks for business integration: Addressing heterogeneous semantics," *Computers in Industry*, Vol. 58, pp. 487– 503, 2007.
- [12] D. Chen, G. Doumeingts, and F. Vernadat, "Architectures for enterprise integration and interoperability: Past, present and future," *Computers in Industry*, Vol. 59, pp. 647– 659, 2008.
- [13] C. M. Chituc, A. Azevedo, and C. Toscano, "A framework proposal for seamless interoperability in a collaborative networked environment," *Computers in Industry*, Vol. 60, pp. 317– 338, 2009.
- [14] K. Ba?na, K. Benali, and C. Godart, "DISCOBOLE: A service architecture for interconnecting workflow processes," *Computers in Industry*, Vol. 57, pp. 768– 777, 2006.
- [15] D. Grigori, F. Casati, M. Castellanos, U. Dayal, M. Sayal, and M. C. Shan, "Business process intelligence," *Computers in Industry*, Vol. 53, pp. 321– 343, 2004.
- [16] R. Jardim-Goncalves, A. Grilo, and A. Steiger-Garcao, "Challenging the interoperability between computers in industry with MDA and SOA," *Computers in Industry*, Vol. 57, pp. 679– 689, 2006.
- [17] H. Jagdev, L. Vasiliu, J. Browne, and M. Zaremba, "A semantic web service environment for B2B and B2C auction applications within extended and virtual enterprises," *Computers in Industry*, Vol. 59, pp. 786– 797, 2008.
- [18] J. Jung, I. Choi, and M. Song, "An integration architecture for knowledge management systems and business process management systems," *Computers in Industry*, Vol. 58, pp. 21– 34, 2007.
- [19] Y. Rezgui, "Role-based service-oriented implementation of a virtual enterprise: A case study in the construction sector," *Computers in Industry*, Vol. 58, pp. 74– 86, 2007.
- [20] G. F. Luger, "AI structures and strategies for complex problem solving," Pearson Education, Fourth Edition, 2006.
- [21] N. Russell, A. H. M. ter Hofstede, W. M. P. van der Aalst, and N. Mulyar, "Workflow control-flow patterns: A revised view.
- [22] J. Rambaugh, M. Blaha, W. Premerlani, F. Eddy, and William Lorensen, "Object oriented modeling and design," Pearson Education.
- [23] M. Priestley, "Practical object oriented design with UML," Tata McGraw-Hill Publishing Company Ltd, 2nd ed., 2005.
- [24] D. Chanda, D. D. Majumder, and S. Bhattacharya, "Virtual consolidation: A new paradigm of service oriented distributed architecture for indian banking system," *Proceedings of International Conference on Emerging Applications of Information Technology*, Elsevier, Kolkata, pp. 57– 62, 2006.
- [25] H. J. Koehler, U. Nickel, J. Niere, and A. Zuendorf, "Integrating UML diagrams for production control systems," *IEEE Computer Society, 22nd Annual Conference on Software Engineering*, 2000.
- [26] E. G. Nadhan, "Service-oriented architecture: Implementation challenges," White Paper in www.microsoft.com, 2004.
- [27] K. Channabasavaiah and K. Holley, "IBM global services," E. M. Tuggle, IBM Software Group, "Migrating to a service - Oriented architecture," White Paper in www.ibm.com, 2004.
- [28] R. R. Nitsure, "Basel II norms: Emerging market perspective with indian focus," *Economic and Political Weekly*, pp. 1162– 1166, 2005.
- [29] W. van der Aalst and K. van Hee "Workflow management: Models, methods, and systems," MIT Press, 2002.
- [30] J. B. Simha and S. S. Iyengar, "Fuzzy data mining for customer loyalty analysis," *9th International Conference on Information Technology*, Vol. 6, No. 18– 21 pp. 245– 246, December 2006.

- [31] Q. Z. Chen, J. H. Han, W. X. He, K. J. Mao, Y. G. Lai " Utilize fuzzy data mining to find the travel pattern of browsers," The Fifth International Conference on Computer and Information Technology, No. 21– 23, pp. 228– 232, September 2005.
- [32] R. B. V. Subramanyam and A. Goswami " A fuzzy data mining algorithm for incremental mining of quantitative sequential patterns," International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems, Vol. 13, No. 6, pp. 633– 652, December 2005.
- [33] J. W. Han, " Data mining: Concepts and techniques," morgan kaufmann publishers Inc., San Francisco, CA, 2005.
- [34] G. Z. Yang, " The complexity of mining maximal frequent itemsets and maximal frequent patterns," Proceedings of the Tenth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining," Seattle, August 22– 25, 2004.
- [35] J. Hai, J. H. Sun, H. Chen, and Z. F. Han " A fuzzy data mining based intrusion detection model," 10th IEEE International Workshop on Future Trends of Distributed Computing Systems (FTDCS' 04), pp. 191– 197, 2004
- [36] W. S. Tai, C. T. Chen " A web user preference perception system based on fuzzy data mining method," Information Retrieval Technology, Lecture Notes in Computer Science, Vol. 4182, 2006.
- [37] B. Bouchon-Meunier " Similarity management for fuzzy data mining," 2007 International Conference on Intelligent Systems and Knowledge Engineering, ISKE, 2007.
- [38] Y. C. Hu, " A new fuzzy-data mining method for pattern classification by principal component analysis," Cybernetics and Systems, Vol. 36, No. 5, pp. 527– 547, July- August 2005.
- [39] M. J. Huang, Y. L. Tsoua, and S. C. Lee " Integrating fuzzy data mining and fuzzy artificial neural networks for discovering implicit knowledge," Elsevier, 2006.
- [40] S. N. Ghazavi and T. W. Liao " Medical data mining by fuzzy modeling with selected features," Artificial Intelligence in Medicine, Vol. 43, No. 3, pp. 195– 206, July 2008.
- [41] R. A. Angryk, " Similarity-driven defuzzification of fuzzy tuples for entropy-based data classification purposes," 2006 IEEE International Conference on Fuzzy Systems, pp. 414– 422, 2006.
- [42] D. A. Chiang, L. R. Chow, and Y. F. Wang " Mining time series data by a fuzzy linguistic summary system," Fuzzy Sets and Systems, Vol. 112, No. 3, pp. 419– 432, June 2000.
- [43] D. D. Majumder and D. Chanda " Datamining & knowledge discovery using a fuzzy mathematical approach for the indian agricultural system management," Fuzzy Logic and its Application to Technology and Management, Narosa Publishing House, pp. 73– 80, June 2006.
- [44] D. D. Majumder and D. Chanda, " Study on a framework for agricultural forecasting systems: An application of information technology & datamining techniques in the Indian scenario," presented in an International Conference on " Recent trends & new directions of research in cybernetics & systems theory" at IASST, Guwahati, India, January 2004.
- [45] D. D. Majumder and S. K. Pal " Fuzzy mathematical approach to pattern recognition," John Wiley & Sons, N.Y., 1986.
- [46] G. J. Klir and B. Yuan " Fuzzy sets and fuzzy logic theory and applications," Prentice-Hall of India Private Limited, New Delhi, 2002.
- [47] P. Adriaans and D. Zantinge, " Datamining."
- [48] J. W. Han and M. Kamber " Datamining concepts and techniques," Morgan Kaufmann Publishers, San Francisco, 2001.
- [49] A. Silberschatz, H. K. Forth, and S. Sudarshan " Database system concepts," McGraw Hill, International Edition, 2002.
- [50] Canara Bank Annual Report, 2007– 2008.