

運用智慧型代理人於電子商務之運作流程:以筆記型電腦產業之供需協商運作流程為例

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摘要

隨著環境的變遷，使得現今企業必須要面對市場的變動、全球性的競爭以及科技創新日新月異等等的挑戰。企業的運作是藉由與上游供應商/下游顧客或組織內各部門來進行溝通協調，而企業的溝通是仰賴於資訊的交換，因此為了使企業能具備快速反應市場的應變能力，確保資訊交換的一致性、正確性和時效性，對企業來說是很一個很重要的課題。因此本研究則利用智慧型代理人 - 自動且無休的協調合作之技術，使分佈在不同地理位置或電腦平臺的使用者(供應商/顧客)可以合作，以滿足使用者的需求目標。本研究依據文獻有關智慧型代理人的定義與特性，以及有關企業任務運作之流程，歸納出一智慧型代理人運作之管理機制。並利用代理人導向之分析與設計方法論，定義智慧型代理人系統中四個角色之責任、權限與協定等關係。而在發展代理人系統時，代理人的外部架構(即所屬環境)與代理人的內部架構皆需討論，但代理人導向之分析與設計對此則缺少討論。因此本研究以統一塑模語言來解決其缺失，並利用統一塑模語言做智慧型代理人系統之系統分析與設計。最後，以筆記型電腦產業之供需協商運作流程作為範例之研究，並實作範例之系統雛型以作驗證。

關鍵詞：溝通協調、資訊交換、智慧型代理人、代理人導向之分析與設計、統一塑模語言

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參考文獻

【1】王立志，「系統化運籌與供應鏈管理」，滄海書局，民國88年。【2】吳宗翰，「代理人為基的供應鏈供需自動協商系統」，國

立臺灣大學工業工程學研究所碩士論文，民國91年。【3】李瓊英，"長鞭效應下,最佳存貨策略的決定與環境變數效果的探討"，國立臺灣大學商學研究所碩士論文，民89年。【4】果云，"供應鏈管理的現在與未來"，資訊與電腦，50-51頁，民88年。【5】林以章，"發展一企業間的電子商務系統模式 - 以物料需求計劃為例"，大葉大學資訊管理研究所碩士論文，民國89年6月。【6】林坤志，"應用多重代理人技術設計拍賣系統"，國立中央大學資訊工程研究所碩士論文，民國89年。【7】林恆旭，"導入企業資源規劃系統對營運流程影響之研究"，國立台北大學會計研究所碩士論文，民國90年6月。【8】林寶香，"智慧型代理人於電子商務之整合與應用"，東海大學工業工程研究所碩士論文，民國89年。【9】邵曉薇、王維民，"電子商務線上交易系統"，旗標出版股份有限公司，民國89年1月。【10】邱世彬，"UML與Petri-net為基礎之多位代理人供應鏈模型分析"，國立高雄第一科技大學運輸與倉儲營運系統碩士論文，民國91年。【11】馬士凱，"以代理人為基礎之彈性製造系統搬運設備協調機制之探討"，國立台北科技大學生產系統工程與管理研究所碩士論文，民國91年。【12】張紹勳，"電子商務"，滄海書局，民國91年9月。【13】張裕益，"UML理論與實作一個案討論與經驗分享"，博碩文化股份有限公司，民國92年3月。【14】曹中天，"管理資訊系統"，鼎茂圖書出版有限公司，民國90年6月。【15】梁文耀、楊攸中，"甲蟲(Beetle)在網際網路上的應用"，行政院國家科學委員會大專生參與專題研究計畫成果報告，民國90年。【16】陳佳琪，"結合電子商務與供應鏈管理之整合研究-電子化 供應鏈管理的實務應用"，國立台灣科技大學管理研究所資訊管理學程碩士學位論文，民國89年1月。【17】陳榮彬，"電子化企業之智慧型監控機制架構之探討"，彰化師範大學商業教育學系碩士論文，民國88年。【18】黃雅君，"資訊電子產業導入企業間電子商務之成功關鍵因素"，國立雲林科技大學工業工程與管理研究所，民國89年。【19】楊錦潭、吳莉欽，"智慧型代理人在教育在的應用"，資訊與教育雙月刊，民國91年6月。【20】葉榮木，"資料結構使用JBuilder"，文魁資訊股份有限公司，民國92年2月。【21】謝政達，"影響台灣中小企業以ASP模式導入延伸式企業資源規劃系統(ERP)"，朝陽科技大學企業管理研究所碩士論文，民國90年6月。【22】謝瑞宏，"分散式多重智慧型代理軟體為基之網路流量擷取系統之研究"，輔仁大學資訊管理學系碩士論文，民國89年。【23】蘇培欣，"智慧型居家服務代理者社群架構之研究與設計"，大葉大學資訊管理研究所碩士論文，民國92年6月。【24】Aldea, A., Banares-Alcantara, R., Jimenez, L., Moreno, A., -Martinez, J., and Riano, D., "The scope of application of -multi-agent systems in the process industry : three case -studies", Expert Systems with Applications, vol. 26(1),p.39-47, 2004.【25】Andreoli, J., Pacull, F., and Pareschi, R., "XPECT: a -framework for electronic commerce", IEEE Internet -Computing, vol. 1(4), pp.40-48, 1997.【26】Arpinar, S., Dogac, A., and Tatbul, N., "An open electronic -marketplace through agent-based workflows: MOPPET", -International journal of Digital Library, vol. 3(1), pp.36-59,2000.【27】Ballou, R. H., Gilbert, S. M., and Mukherjee, A., "New -Managerial Challenges from Supply Chain Opportunities", -Industrial Marketing Management, Vol. 29(1), pp.7-18, 2000.【28】Beale, R., and Wood, A., "Agent-Based Interaction", People -and Computers IX: Proceedings of HCI '94, pp.239-245, 1994.【29】Brenner, W., Zarnekow, R., and Wittig, H., "Intelligent -Software Agents: Foundation and Applications", Springer, -Germany, 1998.【30】Brustoloni, J. C., "Autonomous Agents: Characterization and -Requirements", Carnegie Mellon Technical Report -CMU-CS-91-204, Pittsburgh: Carnegie Mellon University,1991.【31】Collins, J., Bilot, C., Gini, M., and Mobasher, B., "Decision -processes in agent-based automated contracting", IEEE -Internet Computing, vol 5(2), pp.61-72, 2001.【32】Corradi, A., Cremonini, M., Montanari, R., and Stefanelli, C., - "Mobile Agents Integrity for Electronic Commerce -Applications", Information Systems, vol. 24(6), 1999.【33】Durfee, E. H., Kiskis, D., and Birmingham, B., "The agent -architecture of the University of Michigan digital library", IEE -Proceedings of Software engineering, vol. 144(1), pp.61-71,1997.【34】Fischer, K., Chaib-draa, B., Muller, J. P., Pischel, M., and -Gerber, C., "A simulation approach based on negotiation and -cooperation between agents: a case study", Systems, Man, and -Cybernetics, Part C: Applications and Reviews, IEEE -Transactions, vol. 29(4), pp.531-545, 1999.【35】Forrest, B. G., "Insight from Industry: Management the -unmanageable: integrating the supply chain with new -developments in software", Supply Chain Management: An -International Journal, Vol. 6(5), pp.208-211, 2001.【36】Fowler, M., and Scott, K., "UML Distilled: applying the -standard object modeling language", ADDISON-WESLEY, -3rd Printing, 1997.【37】Franklin, S. and Graesser, A., "Is it an Agent or just a Program?", Proceedings of the Third International Workshop -on Agent Theories, Architectures, and Languages, -Springer-Verlag, 1996.【38】Franklin, S., Artificial Minds, Cambridge, MA: MIT Press,1995.【39】Frentzel, D. G., and Seasa, G. J., "Logistics Taking down the -Walls", Annual Conferences Proceedings, CLM, pp.643-654,1996.【40】Greenwald, A. and Stone, P., "Autonomous bidding agents in -the trading agent competition", IEEE Internet Computing, vol. -5(2), pp.52-60, 2001.【41】Hayes-Roth, B., "An Architecture for Adaptive Intelligent -Systems", Artificial Intelligence: Special Issue on Agents and -Interactivity, vol. 72, pp.329-365, 1995.【42】Houliham, J., "Supply Chain Management", Proceedings of -the 19th International Technical Conference of the British -Production and Inventory Control Society, pp.101-110, 1984.【43】<http://home.kimo.com.tw/jymii.jue/artifacts/applyuml/umlref/refermal.htm>【44】Huhns, M. N. and Singh, M. P., "Workflow agents", IEEE -Internet Computing, vol. 2(4), pp.94-96, 1998.【45】Ivezic, N., Potok, T. E., and Pouchard, L., "Multiagent -framework for lean manufacturing", IEEE Internet Computing, -vol. 3(5), pp.58 - 59, 1999.【46】Jennings, N. R., Corera, J., Laresgoiti, I., Mamdani, E. H., -Perriolat, F., Skarek, P., Varga, L. Z., "Using ARCHON to -Develop Real-Word DAI Applications for Electricity -Transportation Management and Particle Acceleator Control", -IEEE Expert, vol. 6(5), pp.64-70, 1996a.【47】Jennings, N. R., Faratin, P., Johnson, M. J., O'Brien, P., and -Wiegand, M. E., "Using Intelligent Agents to Manage -Business Processes", Proceedings of the First International -Conference on The Practical Application of Intelligent Agents -and Multi-Agent Technology, London, UK, pp.345-360,1996b.【48】Jutla, D., Bodorik, P., Hajnal, C., and Davis, C., "Making -business sense of electronic commerce", Computer, vol. 323,pp.67-75, 1999.【49】Kalakota, R. and Whinston, A. B., "Frontiers of Electronic -Commerce", Addison-Wesley, 1996.【50】Kalakota, R., and Robinson, M., "e-Business: Roadmap for -Success", Reading: Addison-Wesley, 1999.【51】Kalakota, R., and Whinston, A. B., "Electronic Commerce:A -Manager 's Guide", Addison Wesley,

1997. 【52】 Karacapilidis, N. and Moraitis, P., " Building an -agent-mediated electronic commerce system with decision -analysis features " , Decision Support Systems, vol. 32(1),pp.53-69, 2001. 【53】 Karacapilidis, N., and Moraitis, P., " Intelligent agents for an -artificial market system " , Proceedings of the Fifth -International conference on Autonomous agents, Montreal, -Quebec, Canada, pp.592-599, 2001. 【54】 Karoway, C., " Superior Supply Chains Pack Plenty of Byte " , -Purchasing Today, Vol. 8(11), pp.32-5, 1997. 【55】 Krishna, V. and Ramesh, V. C., " Intelligent agents for -negotiations in market games " , Power Systems, IEEE -Transactions, vol. 13(3), pp.1103 – 1108, 1998. 【56】 Kusiak, A. and Huang, C. C., " Design of Modular Digital -Circuits for Testability. " , IEEE Transactions on Components, -Packaging, and Manufacturing Technology – Part C, vol. -20(1), pp.48-57, 1997. 【57】 Larsson, J. E. and Hayes-Roth, B., " Guardian: intelligent -autonomous agent for medical monitoring and diagnosis " , -IEEE Intelligent Systems, vol. 13(1), pp.58-64, 1998. 【58】 Lee, H. L., Padamanabhan, V., and Wang, S., " Information -Distortion in a supply chain: The Bullwhip Effect " , -Management Science, vol. 43(4), pp.546-565, 1997. 【59】 Lee, K. J., Chang, Y. S., and Lee, J. K., " Time-bound -negotiation framework for electronic commerce agents " , -Decision Support Systems, vol. 28(4), pp.319-331, 2000. 【60】 Lee, W. P., Liu, C. H., and Lu, C. C., " Intelligent agent-based -systems for personalized recommendations in Internet -commerce " , Expert Systems with Applications, vol. 22(4),pp.275-284, 2002. 【61】 Lewis, T., " Something for nothing [electronic commerce] " , -Computer, vol. 32(5), pp.118 – 119, 1999. 【62】 Liang, W. Y., and Huang, C. C., " The agent-based -collaboration information system of product development " , -International Journal of Information Management, vol. 22(3), -pp.211 – 224, 2002. 【63】 Lin, F. and Pai, Y., " Using multi-agent simulation and -learning to design new business processes " , Systems, Man and -Cybernetics, Part A, IEEE Transactions, vol. 30(3), -pp.380 – 384, 2000. 【64】 Lin, F. R. and Chang, K. Y., " A multiagent framework for -automated online bargaining " , IEEE Intelligent Systems, vol. -16(4), pp.41-47, 2001. 【65】 Lin, J., and Yeh, C., " An Object-Oriented Model for -Software Project Management " , OOTSIG, Vol. 1, 1999. 【66】 Maes, P., " Artificial Life Meets Entertainment: Life like -Autonomous Agents " , Communications of the ACM, vol. -38(11), pp.108-114, 1995. 【67】 Mandry, T., Pernul, G., and Rohm, A. W., " Mobile Agents in -Electronic Markets: Opportunities, Risks, Agent Protection " , -International Journal of Electronic Commerce, vol. 5(2),pp.47-60, 2001. 【68】 Mcnay, H. E., " UML for e-business: new use for use cases " , -Professional Communication Conference Proceedings. IEEE -International, vol. 24-27, pp.245-249, 2001. 【69】 Merwe, J. and Solms, S. " Electronic commerce with secure -intelligent trade agents " , Computers & Security, vol. 17(5), -pp.435-446, 1998. 【70】 Moore, S. A., " KQML and FLBC: Contrasting Agent -Communication Languages " , International Journal of -Electronic Commerce, vol. 5(1), pp.109-124, 2001. 【71】 Mori, M., Tsuru, H., Itsuki, R., Kitajima, H., Yajima, H., - " Proposal of application architecture in electronic commerce -service between companies " , Advance Issues of E-Commerce -and Web-Based Information Systems, WECWIS, International -Conference, pp.46-49, 1999. 【72】 Muller, M., Wooldridge, J., and Jennings, N.R. -(eds.), " Intelligent Agents III: Agent Theories, Architectures, -and Languages " , Springer Verlag, New York, pp.261-275,1997. 【73】 Nissen, M. E., " Supply chain process and agent design for -E-commerce. " , Proceedings of the 33rd Annual Hawaii -International Conference on System Sciences, pp.1885 – 1894,2000. 【74】 Papaioannou, T. and Edwards, J., " Using mobile agents to -improve the alignment between manufacturing and its IT -support systems " , Robotics and Autonomous Systems, vol. 27,pp.45-57, 1999. 【75】 Park, H. G. and Baik, J. M., " Enhancing manufacturing -product development through learning agent system over -internet " , Computers & Industrial Engineering, vol. 37, -pp.117-120, 1999. 【76】 Pedersen, P. E., " Behavioral Effects of Using Software Agents -for Product and Merchant Brokering: An Experimental Study -of Consumer Decision-Making " , International Journal of -Electronic Commerce, vol. 5(1), pp.125-141, 2001. 【77】 Radstaak, B.G., and Ketelaar, M.H., " Worldwide Logistics: -The Future of Supply Chain Services " , Holland International -Distribution Council, Hague, The Netherlands, 1998. 【78】 Russell, S. J. and Norvig, P., " Artificial Intelligence: A -Modern Approach " , Englewood Cliffs, NJ: Prentice Hall,1995. 【79】 Saleh, K., " Documenting electronic commerce systems and -software using the unified modeling language " , Information -and Software Technology, vol. 44(5), pp.303-311, 2002. 【80】 Saleh, K., Demarais, C., and Koppler, R., " Distributed object -computing and its application in electronic commerce -systems " , Computer Systems and Applications, ACS/IEEE -International Conference on, pp.495-498, 2001. 【81】 Santa Clara, " Unified Modeling Language For Real-Time -System Design version 2.0 " , Rational Software Corporation, -CA: Rational Software Corporation. 【82】 Sierra, C., Faratin, P., and Jennings, N. R., " A -Service-Oriented Negotiation Model between Autonomous -Agents " , Proc. 8th European Workshop on Modelling -Autonomous Agents in a Multi-Agent World, Ronneby, -Sweden, pp.17-35, 1997. 【83】 Silverman, B. G., Bachann, M., and Al-Akharas, K., " Do what -I mean: online shopping with a natural language search agent " , -IEEE Intelligent Systems, vol. 16(4), pp.48-53, 2001. 【84】 Sim, K. K. and Chan, R., " A brokering protocol for -agent-based e-commerce " , Systems, Man and Cybernetics, -Part C: Applications and Reviews, IEEE Transactions on, vol. -30(4), pp.474-484, 2000. 【85】 Sim, K. M. and Wong, E., " Toward market-driven agents for -electronic auction " , Systems, Man and Cybernetics, Part A, -IEEE Transactions on, vol. 31(6), pp.474-484, 2001. 【86】 Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E., " Designing -and Managing the Supply Chain:concepts, strategies, and case -studies " , NY: McGraw-Hill Inc, 2001. 【87】 Smith, D. C., Cypher, A., and Spohrer, J., " KidSim: -Programming Agents Without a Programming Language " , -Communications of the ACM, vol. 37(7), pp.55-67, 1994. 【88】 Sycara, K., Pannu, A., Williamson, M., Dajun Zeng, and -Decker. k., " Distributed Intelligent Agents " , IEEE Expert, vol. -11(6), pp.36-46, 1996. 【89】 Tan, G. W., Hayes, C. C., and Shaw, M., " An intelligent-agent -framework for concurrent product design and planning " , -Engineering Management, IEEE Transactions, vol. 43(3),pp.297-306, 1996. 【90】 Tarumi, H., Matsuyama, T., and Kamabayashi, Y., - " 10 Evolution of business processes and a process -simulation tool " , Software Engineering Conference, Sixth -Asia Pacific, pp.180-187, 1997. 【91】 Tenenbaum, J. M., Chowdhry, T. S., and Hughes, K., " Eco -System: an Internet commerce architecture " , Computer, vol.30(5), pp.48-55, 1997. 【92】 Tsukada, T. K. and Kang, G. S., " Distributed tool sharing in -flexible manufacturing systems " , IEEE Transactions on

-Robotics and Automation, vol. 14(3), pp.379-389, 1998. 【93】 Turowski, K., “ Agent-based e-commerce in case of mass -customization ” , International Journal of Production -Economics, vol. 75(1-2), pp.69-81, 2002. 【94】 Uehara, S., Mizuno, O., and Kikuno, T., “ An implementation -of electronic shopping cart on the Web system using -component-object technology ” , Object-Oriented Real-Time -Dependable Systems, Proceedings. Sixth International -Workshop on, pp.77-84, 2001. 【95】 Vidal, C. J., and Goetschalckx, M., “ Strategic -production-distribution models: A critical review with -emphasis on global supply chain models, ” European Journal -of Operational Research, Vol.98, No.1, pp.1-18, 1997. 【96】 Wooldridge, M., Jennings, N. R., and Kinny, D., “ A -methodology for Agent-Oriented Analysis and Design ” , ACM,1999. 【97】 Wu, D. J., “ Artificial Agents for Discovering Business -Strategies for Network Industries ” , International Journal of -Electronic Commerce, vol. 5(1), pp.9-36, 2001. 【98】 Yager, R. R., “ Targeted e-commerce marketing using fuzzy -intelligent agents ” , IEEE Intelligent Systems, vol. 15(6),pp.42-45, 2000. 【99】 Zhao, G., Deng, J., Shen, W., “ GLOVER: an agent-based -approach to systems interoperability in cooperative design -systems ” , Computers in Industry, vol. 45, pp.261-276, 2001.